Report of
Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands San Diego County, California

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EXECUTIVE SUMMARY

This report provides methods, results, discussion, and recommendations for a study of California Gnatcatcher (*Polioptila californica*) natal dispersal at a 200 acre (80-hectare) area of open space divided by an interstate highway, in the Lakeside area of San Diego County, California. The study area lies 23 miles east of the Pacific Ocean at the inland edge of a coastal plain and has a relatively warm, dry Mediterranean-type climate. Topography consists predominantly of moderate slopes on either site of Interstate-8 (I-8) with the more southerly parcel of steeper grade. Elevation ranges from about 700 to 1100 feet.

The primary goal of the study was to evaluate whether California Gnatcatcher movement across I-8 occurs at the study area and thus shed light on whether this area serves as a functional corridor - at least for the California Gnatcatcher - as assumed in the MSCP Subarea Plan.

Field work was conducted during dry conditions, and simple nest success (that is, the number of nests that produced fledged young) of the subject species was less than 50%. We found and monitored seven pairs of California Gnatcatchers in our study area. We found a total of 11 nests during the study period, an average of about 1.6 nests per pair of California Gnatcatchers; however only six of the pairs constructed nests. Of the 11 found nests, four were successful, that is, they produced young that fledged; five were abandoned prior to egg deposition; and two were destroyed by causes unknown. We banded young at the nest, or we captured juvenile California Gnatcatchers soon after fledging by strategically placing mist nets within natal territories at locations past which we expected family groups to move. We determined the banding strategy based on our assessment of whether approaching a nest would have a high or low likelihood of affecting the nest outcome. We banded all seven successfully fledged young from the site with no mortality (Table 1). Six of these were banded as fledglings; one was banded as a nestling.

On 23 July 2002 Kylie Fischer documented the occurrence in the Pembroke parcel of a juvenile (left leg white; right leg silver USGS) that had been banded on 11 June 2002 in Territory C-01b-02 of the CalTrans parcel, that is, north of I-8. This bird had been observed on the CalTrans parcel during the previous week (15 July). On 13 September 2002 William Haas detected a banded juvenile (left leg purple; right leg silver USGS) on the Gatlin parcel. This bird was banded on the CalTrans site on 11 June 2002 in Territory C-01b-02. These were the only two incidents during which we could ascertain movement of juvenile California Gnatcatchers between the northern and southern parcels.

The short period of this inquiry and the small number of nests and consequent small number of fledglings preclude extrapolation of our data to other sites. The sample size is very small, the work was limited to a single year during an unusual drought, and the results do not conflict with existing published information. However, we feel that the value of the positive results, the relative objectivity of the data, and its specificity to management of these particular sites add to its usefulness.

1.0 INTRODUCTION

Nature reserves are typically designed to meet one or more of several biological purposes (Soulé and Simberloff 1986). Among these are: preservation of large functioning ecosystems, preservation of biodiversity, and conservation of designated species or groups of species of special interest or concern. Except where a sufficiently large area may be set aside, reserves are often created within a system of smaller parcels that, to be successful, must meet two major needs of habitat conservation planning:

1. Preserve components must be of suitable size to maintain plant and animal metapopulations, and

2. The preserve units must be connected by corridors of appropriate length and composition (e.g., vegetative make-up or usable substrate) to ensure dispersal and gene flow within otherwise isolated segments of animal and plant populations (Meffe and Carroll 1994).

Initial choices about land preservation are often constrained by limited information and narrow time frames. In such cases follow-up investigations are appropriate to test success criteria or to implement appropriate adaptive management strategies. The parcels in the current study have been incorporated as key parts of the single most important preserve system in coastal San Diego County, one of the most biologically diverse areas in North America. Preserve design mandates that the major highway between them not act as an impediment, however this premise has not been tested. This investigation puts the assumption to the test by investigating dispersal of one target species between parcels located north and south of I-8 in the unincorporated community of Lakeside, San Diego County, California (Figure 1). Our study species, the California Gnatcatcher, is one of the principle target species covered under the state Natural Community Conservation Program (NCCP) and the southwestern San Diego Multiple Species Conservation Program (MSCP).

Our study area is approximately 200 acres (ca. 80 hectares) composed of two sites, one located immediately to the north of I-8, the second located immediately to the south. These two sites are part of the lands preserved for the MSCP, and this work is conducted in support of the requirements for biological monitoring under that program. The busy interstate highway constitutes a potential barrier to movements between the two study sites, especially by a six-gram, non-migratory songbird that is a relatively weak flier. Prior to the construction of I-8, the sites were connected by a more gently contoured ravine typical of California Gnatcatcher habitats throughout its southern California range, and which can safely be assumed not to have imposed an impediment to their dispersal.

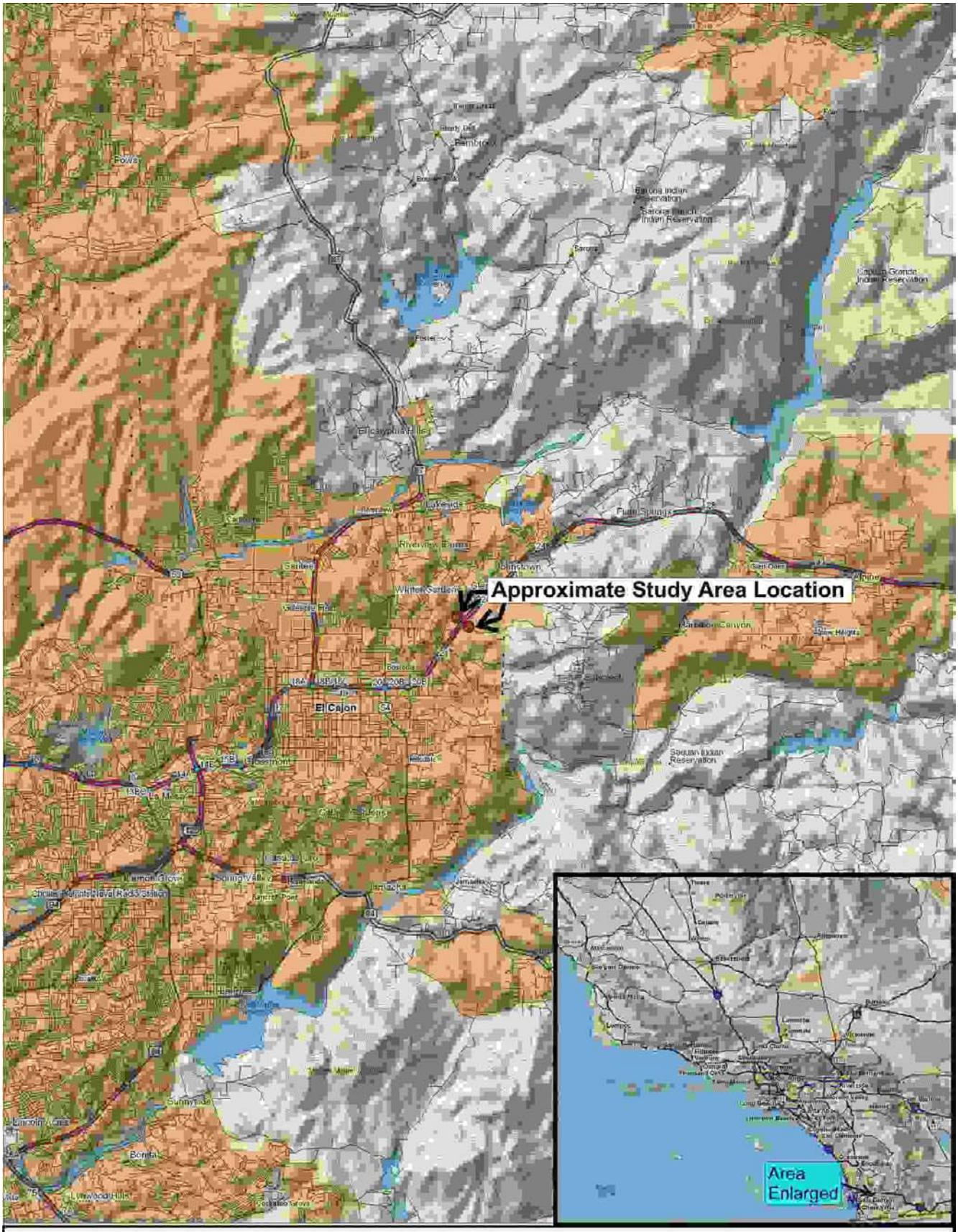


Figure 1
Study Area Vicinity
MSCP Lakeside Archipelago Lands
San Diego County, California

0 mi. 2.8 mi.

N
W E
S

Source Map: Delorme TopoUSA 3.0
Scale: approximately 1 inch = 2.8 miles

1.1 Project Site Location and Conditions

1.1.1 Location

The study area is approximately 23 miles due east of the Pacific Ocean at La Jolla, on the coastal slope of southern California (Figure 1). It is located in the Lakeside Community Planning Area, San Diego County, California and consists of approximately 200 acres of publicly and privately owned land in portions of the El Cajon Rancho, Township 15 South, Range 1 East of the U.S. Geological Survey (USGS) 7.5' minute El Cajon, California map, San Bernardino Base and Meridian. Functionally, the study area is within the Metro Lakeside-Jamul Segment of the County of San Diego's MSCP Subarea Plan.

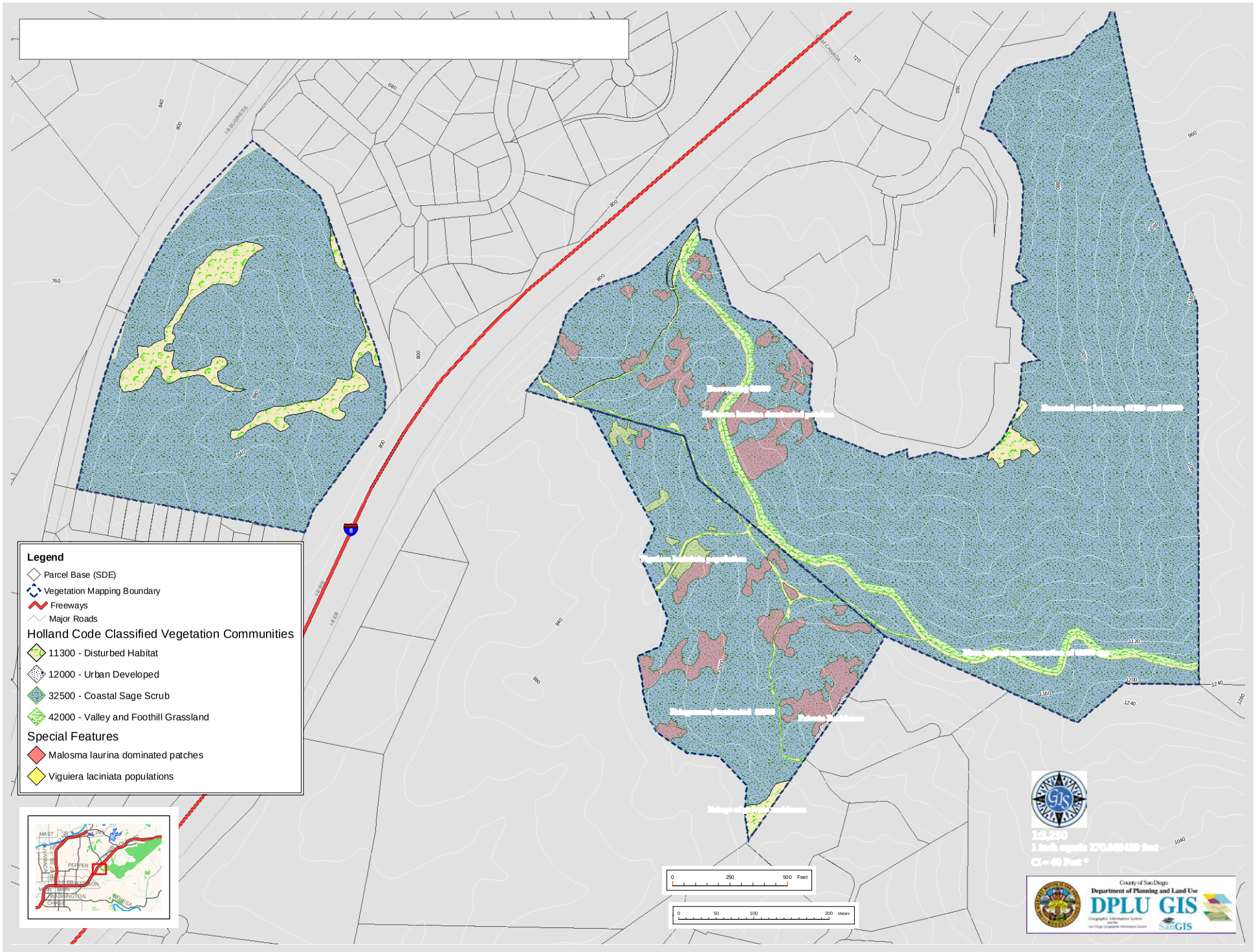
The specific properties constituting the site south of I-8 include portions of the Gatlin mitigation parcel (APN 401-191-03), and the Pembroke mitigation parcel (APN 401-010-03-02). The site to the north of I-8 consists of the California Department of Transportation (CalTrans) mitigation parcel (APN 400-070-05).

The elevation of the study area ranges between about 700 and 1100 feet (about 210 to 335 meters). Soils are primarily Cieneba (CmrG), and Vista (VvG, VsE, VsG) (Bowman 1973). The southern study site is generally hilly, sloping from south to north with steep, manufactured slopes descending to I-8. The northern study site is overall more gently sloped and is comprised of a relatively steep east-facing slope along its eastern boundary and a contoured central plateau composed of several shallow basins of various aspect. The islands of coastal sage scrub within the Lakeside archipelago are identified by the wildlife agencies and the County as containing "very high quality" habitat for California Gnatcatchers (M. Webb, Dept. of Parks and Recreation, pers. comm.). The study parcels presumably provide linkage to adjacent open space parcels located north and south of the study area (Figure 2), although to the south the habitat changes dramatically to dense chaparral and to the north the open space is located in a mosaic of parcels (the archipelago) separated by residential and industrial development.

1.1.2 Vegetation

Habitats at both study sites are variants of sage scrubs common along the southern California coast (Appendix A, Figures A-1 to A-7). The southern parcel is characterized by a variety of Diegan coastal sage scrubs that include several distinct pockets dominated either by Black Sage (*Salvia mellifera*), Laurel Sumac (*Malosma laurina*), or Chaparral Broom (*Baccharis sarothroides*). Their histories are related to previous patchy disturbance (mechanical or fire-related), and the overall time period since the area was last burned. Relatively greater vegetation density and diverse composition on the southern parcels are fostered by both the northerly aspect and drainage from a greater area. The CalTrans parcel north of I-8 is more sparsely vegetated, primarily by sage scrubs dominated by California Sagebrush (*Artemisia californica*). This parcel exhibits a relatively

Insert Figure 2



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greater percentage of disturbed habitat - of uncertain origin - than do the southern parcels. The disturbed areas are characterized by a mosaic of nonnative mustard-dominated disturbed grasslands and sage scrubs and a network of dirt roads. The relatively lower density and less variable vegetative composition of this site is probably related to its disturbance history, smaller size, and extremely limited watershed, compounded by a relatively large network of mechanically constructed disturbance corridors (i.e., footpaths, motorcycle trails) that foster invasive species colonization.

1.1.3 Climatological Conditions

Our one-year study began in March 2002, toward the latter part of the driest rainfall season (defined as the period between 1 July and the ensuing 30 June) in San Diego County since statistics have been recorded (1 July 1850 through 30 June 1851; Brad Doyle, U.S. Weather Bureau, 13 September 2002 pers. comm.). By March, the Lakeside area had received a total of 4.1 inches of rain since 1 July 2001 (recorded at the U.S.D.A. Forest Service weather station in Alpine, CA; Latitude 33.8340°N, Longitude 116.7390°W, a distance of 6 miles from the study area). By the end of the rainfall year, a total of 5.5 inches had fallen in the Lakeside area, more than 4 inches below the normal for this area (Appendix B, Figures B-1 through B-6).

Beginning with the first seasonal rainfall (0.5 inches) between 7 and 8 September 2002 and the end of this study (at the onset of breeding at the study sites - we found the first California Gnatcatcher nest of the 2003 breeding season on 6 March) on 15 March 2003, approximately 12.3 inches of rain had fallen at the study site (Appendix B, Figures B-6 through B-14).

Temperatures recorded at the Alpine weather station during the study period were typical of normal weather patterns in east San Diego County (Appendix B, Figures B-15 through B-25).

1.2 Goals of the Study

The Coastal California Gnatcatcher (*P. c. californica*) is a federally-listed threatened species under the Endangered Species Act of 1973, as amended (USFWS 1993). It is the only San Diego County breeding representative of a species that inhabits southern California and most of the Baja California peninsula, Mexico. It is one of the principal target species covered under both the state NCCP and the western San Diego MSCP. This 6-gram songbird is a non-migratory resident of coastal sage scrub vegetation communities (Atwood and Bontrager 2001). Population dynamics and dispersal patterns of this species in the San Diego County region remain too poorly documented to support confident evaluation of either large-scale population viability or effective smaller scale site management, although Bailey and Mock (1998) suggest that dispersal capability has previously been underestimated.

The primary goal of the study is to evaluate whether California Gnatcatcher movement across I-8 occurs at the study area and thus shed light on whether this area serves as a functional corridor - at least for California Gnatcatcher - as assumed in the MSCP Subarea Plan. To provide baseline data relevant to this objective we enumerated and monitored the distribution of California Gnatcatchers at the study area, monitored breeding activity, color banded nestlings and juveniles, and conducted focused surveys to detect banded birds within our study parcels. These measures were intended to support data gathering on immigration and emigration of individual California Gnatcatchers at or between the study sites.

California Gnatcatcher habitat in the study area may be vulnerable to impacts from adjacent areas, including existing infrastructure and future development. Baseline occurrence, territory location, and movement data were also collected as part of MSCP efforts to: (1) assist in the planning of regional linkages and connections, (2) establish how the connections relate to direct and indirect impacts of existing and/or future highways and private development, and (3) examine the MSCP assumption that California Gnatcatcher movement occurs across I-8.

1.3 Background Biological Information

1.3.1 Concepts and Issues Relevant to Avian Dispersal

One of the most difficult aspects of planning and managing a large system of reserves across a patchwork landscape is effectively addressing the question of whether the individually protected areas are and will continue to function as part of a healthy regional ecosystem. In a functioning ecosystem, vital processes result from connections among the patches and not simply from the interactions within patches. These connections, or corridors, including island corridors, function when there is a successful match between the parameters of the corridors and the spatial needs of the individual species.

Given the existing literature on natal dispersal generally and that of California Gnatcatcher in particular (see Hunsaker *et al*. 2000), it is inconceivable that the species would not (ever) cross the gap between our two study areas. However, the question of the rate at which they cross remains important at two different scales. First, at the local scale, it is important that the rate of passage is sufficient to support timely "rescue" of each small sub-population. Given the small size of the local sub-populations in the study area, substantial risk of local extirpation due to random events can be assumed (Foley 1994) even in the absence of observed conditions and disturbances. Second, at the regional scale, it is important that the rate of passage is sufficiently high to support needed gene flow between sub-regional populations yet low enough to retard adverse effects such as the flow of disease or predator irruptions. At both scales, an asymmetrical rate of flow between the two sides probably occurs, and can be of significance at each scale. These issues may be investigated using a variety of methods

ranging from a few very intensive, long-term studies to many small, shorter-termed studies, although for small studies, repeatability of methods and control or quantification of the variables becomes more important.

More generally, there are values to viewing natal dispersal not as a phenomenon that is present or absent but as a rate of flow with specific impedances at a given site. As an example, it may be more useful to ask if a particular corridor is providing a sufficient rate and type of "flow" of successful dispersants for a species, rather than asking only if the corridor does or does not allow passage for that species.

Salient questions in the current context of the MSCP and this study area are whether remaining populations of California California Gnatcatchers on preserved lands are now functioning as an effective metapopulation, whether California Gnatcatchers remaining in the future will continue to do so, and if not, what management measures are available to address this.

A review of published data on natal dispersal shows that for vertebrates in general, such information is abundant but largely anecdotal. This reflects both the important role of dispersal and the difficulty of gathering comprehensive data that reflects population-level dynamics. In recent years attempts have increased to seek patterns among studies and even consider bases for predictions. A useful review of the available data, ideas, and remaining problems in studying dispersal is provided by Sutherland *et al* (2000) together with responding comments by Mayer *et al* (2002). The ability to make confident projections about dispersal in particular situations, using factors such as life history variables, population trend, and environmental conditions, has clearly not arrived. However, within a decade or so it might become possible to make usefully-accurate estimates in some cases with such information when adjusted by limited data sets such as are usually available under limited time and funding. Any species' viability is heavily dependent on whether its geographical ecology is supported or obstructed by the spatial features of reserves and surrounding matrix.

1.3.2 California Gnatcatcher Dispersal Information

Peer-reviewed sources specifically addressing California Gnatcatcher natal dispersal at least in part include Akcakaya and Atwood (1997), Bailey and Mock (1998), and Galvin (1998). A useful summary of these and additional unpublished data is included in Atwood and Bontrager (2001). Unpublished reports include Hunsaker *et al* (2000) who documented dispersal across several four-lane highways and/or high volume surface streets.

Based on the above sources, it appears California Gnatcatcher natal dispersal occurs in a short, well-defined period. It may often include areas unsuitable as breeding habitat; Atwood and Bontrager (2001) note the occurrence of, "dispersal across highly human-modified landscapes, including major highways, residential communities, and golf courses occurs at least occasionally." The following points further reflect our current level of knowledge:

1. No significant difference is known between males and females in distance or timing of natal dispersal.

2. Data so far suggests that dispersal direction is random, but there may have been no formal testing thus far.
3. Juveniles typically become independent from parents at around 28-30 days after fledging, and occasionally earlier if the parents initiate a new nest (Hunsaker *et al* 2000; W. Haas pers. obs.) .
4. Available sources indicate natal dispersal can begin as early as 18 days after fledging (W. Haas pers. obs.) and among most individuals appears complete by about 80 - 100 days after fledging, although observations also indicate that juveniles from the last successful nest attempt of the season may at least sometimes remain with parents and forage as a family group through the first winter until just prior to initiation of breeding activity (W. Haas, K. Fischer, I. Quon pers. obs.).
5. Factors affecting the choice of dispersal routes are unknown, as are behaviors in response to various disturbances encountered during dispersal (e.g., noise, night-lighting, etc.).
6. Rates of mortality during natal dispersal are unknown, as are whether or how such rates may vary by sex, by seasonal timing, by annual weather, by landscape factors, or by total distance traveled.
7. Based on data from Patten and Campbell (1994) and Atwood and Bontrager (2001), the mean fledging date in California is about 19 May (s.d. = about 22 days). Thus it appears most natal dispersal occurs between 28 May and 18 September, with a peak around late July. Year-to-year weather and local conditions presumably affect this as well.

2.0 METHODS

In order to document dispersal between the southernmost of the Lakeside archipelago islands north of I-8 (that is, the CalTrans parcel) and the preserve lands on its south side, and because of the unpredictability of the timing of natal dispersal by specific individuals, we knew it would be necessary to monitor individuals for extensive time periods. Constant visual monitoring is virtually impossible, especially of a small songbird and the limited ability of humans to discern individuals. Technological aids such as radio transmitters have been developed to aid in such monitoring, however current technology has yet to develop a long-lasting transmitter for species as small as the California Gnatcatcher, let alone demonstrate that such devices will not affect their behavior or mortality rates. One of few telemetry studies of a small passerine, the 13-gram southwestern willow flycatcher (*Empidonax traillii extimus*) resulted in a maximum study period of 8 days (E. Paxton pers. com.).

Since the first large-scale, systematic effort in 1899 (Campbell and Lack 1985; see under "marking"), ornithologists have relied on several simple tools to aid identification of free-flying birds, including plumage dyeing, patagial tags (e.g., for ducks, birds of prey), and metal and colored bands affixed to the legs. The latter relatively simple system, by far the most common technique used, results in the marking of more than one million individual birds each year (1,049,646 were legally banded in 2001; U. S. G. S. Bird Banding Lab, Patuxent, Maryland) with very low mortality and injury rates, and this method was the obvious choice for this

study. In order for us to determine that an individual gnatcatcher had crossed I-8, we needed only to find and carefully identify our distinctly color-marked individuals on the opposite side of the interstate from that on which they had been banded.

2.1 Field Methods

2.1.1 Breeding Season Surveys (March-August)

Varanus personnel visited the study area regularly beginning in early March 2002 and continuing through the end of August 2002. Surveys were conducted by walking meandering transects through each site to locate all California Gnatcatcher breeding pairs. Based on behavioral cues (*e.g.*, California Gnatcatchers carrying nest material or repeated visits by the same individual to a specific area) we located active nest sites. Once nest sites were found, they were mapped using a hand-held Global Positioning System (GPS) data recorder accurate to 2.5 meters.

Initially we had planned on banding locals (nestlings) by removing them from the nest, withdrawing from its vicinity, applying a unique color band scheme to each bird, then returning each young gnatcatcher to its nest. Because of the extremely low cumulative seasonal rainfall total in winter 2001/2002, the preponderance of vegetation on the sites was extremely dry and/or senescent. Based on our assessment of the increased potential for adverse impacts on both nest success and adult survivorship - including the possibilities of leading predators to poorly camouflage nests and leaving a lingering trace of our presence by which a predator might find a nest - we decided that during the 2002 breeding season we would avoid all direct contact with active nests. Instead, we chose to band juveniles soon after fledging by strategically placing mist nets within natal territories at locations past which we expected family groups to move.

Family groups are relatively easy to locate because they are typically very noisy; adults and juveniles maintain contact while they move through and forage within their territories. Since the goal of the study was to band young, we could collect nest data (location, height above ground, substrate, etc.) after young were fledged. This choice of timing reflected prudence in view of the extreme conditions we observed at the study sites and limited the possibility we might endanger the success of nests. Once we had a sample of banded birds, during each site visit we attempted to locate and record the locations of all color marked birds, noting the complete color band combination if discernable.

2.1.2 Non-Breeding Season Surveys (September - January)

Varanus personnel regularly visited the study site between 01 September 2002 and 31 January 2003. Surveys were conducted by walking meandering transects through each site to locate all California Gnatcatchers.

We documented locations of California Gnatcatchers during each site visit, especially focusing on color-marked birds.

2.1.3 Banding

We planned to place a unique combination of three or four appropriately sized, colored leg bands on locals (= nestlings) removed from the nest between days 7 and 9 after hatching. As indicated previously, we chose to band juveniles captured in mist nets within two weeks of their leaving the nest. We prepared our color bands following the techniques outlined in Haas and Fischer (1999). We used a single color-anodized U. S. Fish and Wildlife Service aluminum band of size 0A (inside diameter = 2.00 ± 0.10mm) in association with two or three celluloid bands, with no more than two bands total per leg. Prior to entering the field we re-sized the celluloid bands to 1.90 ± 0.05mm to form a unique leg-band color combination on each juvenile gnatcatcher that we captured.

3.0 RESULTS AND DISCUSSION

3.1 Breeding Dynamics

Seven total pairs of California Gnatcatchers were detected within the two study areas, five on the south side of I-8 and two on the north side of I-8 (Figures 3 and 4). Probably related to the extremely dry winter, gnatcatcher breeding activity was delayed. We found the first gnatcatcher nest of the breeding season on 15 April. Based on our previous data from more than 400 California Gnatcatcher nests, this is approximately one month later than the average first nesting date we recorded between 1992 and 2000. We also noted reduced breeding activity levels (late onset of breeding or even a lack thereof) in other sage scrub passerines species present within the study areas. Similar results were reported from both anecdotal data and focused monitoring studies elsewhere in the county (Philip Unitt, Tricia Campbell, pers. com.).

In 2002 we found a total of 11 nests of the California Gnatcatcher at the study area, an average of about 1.6 nests per pair of California Gnatcatchers that occupied the study site. However only six of the pairs constructed nests; we did not find any nests for pair W-05. Of the 11 found nests, four were successful, that is, they produced young that fledged (successfully departed the nest); five were abandoned prior to egg deposition; and two were destroyed by causes unknown.

The number of eggs deposited per nest ranged from one to three (N = 14). The average number of eggs per nest was 1.3, or 2.3 if abandoned nests are excluded. All eggs hatched, thus the number of nestlings also ranged from one to three per nest, with an average of 1.3 or 2.3 nestlings per nest. Two nests of three eggs/nestlings (W-01a-02 and C-01a-02) were unsuccessful. On the day we found nest W-01a-02 destroyed, the nest should have held three 12-day old nestlings. Instead we found disturbance in the vicinity of the nest

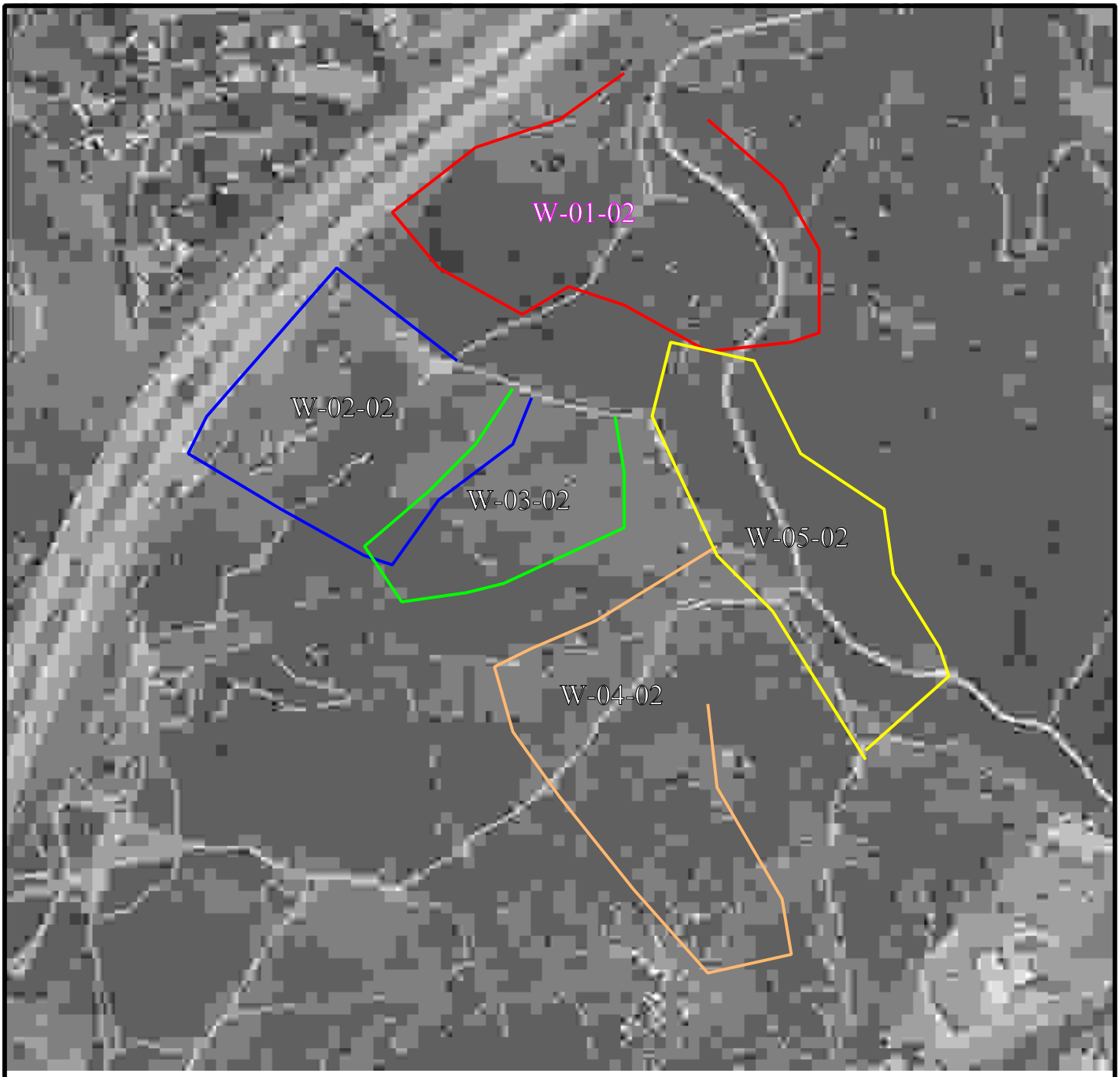

Figure 3
South Survey Area (Gatlin & Pembroke Mitigation Parcels)
Approximate California Gnatcatcher Territories
MSCP Lakeside Archipelago Lands
San Diego County, California

Figure 4
North Survey Area (CalTrans Mitigation Parcel)
Approximate California Gnatcatcher Territories
MSCP Lakeside Archipelago Lands
San Diego County, California

plant and the nest destroyed. Nest C-01a-02, also with three eggs/nestlings, visited on day eight after hatching, was found empty with no visible signs of disturbance in its vicinity.

One nest (W-04a-02) of two eggs/nestlings produced only one fledgling. Cause of the loss of one nestling was undetermined. The surviving young, (Left-orange, right silver; Table 1), banded from the nest as a local, was observed on several occasions after it had fledged, including once as it foraged with its parents more than one-quarter mile from its nest site. The remaining nests yielded three (W-01c-02), two (C-01b-02), and one (C-02c-02) fledgling respectively. Four of the seven pairs on the site produced at least one fledgling (57% success) while the overall nest success rate was 36% (4 of 11 nests were successful if abandoned nests are included). All seven 2002 fledgling California Gnatcatchers from the site were banded during this study, with no mortality (Table 1). Six of these were banded as fledglings; one was banded as a nestling.

Table 1: Banding combinations

NestName*	Date Banded	Left Leg	Right Leg	Banding Age
W-04a-02	14 May 02	orange	Silver USGS	Chick (9 days old)
C-01b-02	11 June 2002	white	Silver USGS	Fledgling (22 days old)
C-01b-02	11 June 2002	purple	Silver USGS	Fledgling (22 days old)
W-01c-02	3 July 2002	purple/purple	Silver USGS	Fledgling (25+ days old)
W-01c-02	3 July 2002	dark blue/orange	Silver USGS	Fledgling (25+ days old)
W-01c-02	3 July 2002	orange/orange	Silver USGS	Fledgling (25+ days old)
C-02c-02	23 July 2002	yellow/blue	Blue USGS	Fledgling (36+ days old)

Key to Nest Name

W; C - Southern parcels (Gatlin or Pembroke parcel); CalTrans or northern parcel

01a - Designates the pair number ("1") and nest attempt ("a" = 1st attempt, "b" = 2nd attempt, etc.)

02 - Indicates year of study (2002)

3.2 Dispersal

On 23 July 2002 Kylie Fischer documented the occurrence in the Pembroke parcel of a juvenile (left leg white; right leg silver USGS) that had been banded on 11 June 2002 in Territory C-01b-02 of the CalTrans parcel, that is, north of I-8. This bird had been observed on the CalTrans parcel during the previous week (15 July). On 13 September 2002 William Haas detected a banded juvenile (left leg purple; right leg silver USGS) on the Gatlin parcel. This bird was banded on the CalTrans site on 11 June 2002 in Territory C-01b-02.

Immigrant California Gnatcatchers (that is, non-resident adults and juveniles) were detected on the northern parcel; we found no immigrant California Gnatcatchers on the southern parcels with the exception of the two aforementioned banded juveniles. Two immigrant juveniles and an adult pair were detected in July 2002. One additional immigrant juvenile was detected during October 2002. None of these immigrants remained at the study site for more than one week.

3.3 Discussion

Conditions throughout southern California during 2002 were extremely dry. The period between July 2001 and June 2002 was the driest in San Diego recorded history dating back to the period 1 July 1850 to 30 June 1851 (Brad Doyle, U.S. Weather Bureau, 13 September 2002 pers. com.). Because of the dry conditions, much of the vegetation in our study sites became senescent, resulting in suspension of vegetative growth and the defoliation of a large percentage of its leafy canopy. This brought about a reduction of protective and cryptic cover typically afforded gnatcatcher nests in more normal rainfall periods. We believe that under those conditions, human scent left in the vicinity of a nest lingers for a greater time period. With little cover to provide concealment or protection we felt we would be remiss to approach and band chicks at the nest. We continued to band fledglings within two weeks of their leaving the nest, however we altered our methods to vouchsafe active nests.

During July and August we observed an influx of California Gnatcatchers into the CalTrans parcel. In addition to pairs C-01-02 (with their two juveniles) and C-02-02 (with one juvenile) we documented the occurrence at the CalTrans parcel of one additional adult pair (based on plumage and behaviors) as well as one pair of juveniles (based on plumage). The history of their occurrence is unknown; none of these individuals was marked in such a way that we could establish their place of origin; moreover they remained at the study site for less than a week. On 15 July, the C-01b-02 fledgling, banded left leg white, right leg silver (USGS), was seen between territories C-01-02 and C-02-02 on the CalTrans parcel. On 23 July, the same individual was observed foraging south of W-05-02 and north of W-01-02 on the WalMart parcel. On 13 September, the C-01b-02 fledgling banded left leg purple, right leg silver (USGS) was observed foraging within the territory W-01-02 on the WalMart parcel. Thus, between 15 July and 13 September two of our banded juveniles crossed I-8, from north to south. Timing of this dispersal is within the natal dispersal period documented in records from previous studies (K. Fischer field notes; W. Haas field notes) and suggests that juvenile dispersal surveys conducted soon after fledging occurs may be most productive.

Available data do not show that natal dispersal in this species occurs only in a single, defined period. It is quite possible for example that dispersal occurs in a primary period upon independence and then a pre-breeding dispersal in late winter and early spring, the latter more focused on finding optimal habitat and a mate.

There is anecdotal support for this idea (K. F. Campbell, pers. obs.), and it is documented in at least one other non-migratory, insectivorous songbird, the Black-capped Chickadee (*Poecile atricapillus*) (Weise and Meyer 1979). However our studies on this matter are inconclusive. The short period of this inquiry and the small number of nests and consequent small number of fledglings preclude extrapolation of our data to other sites. Moreover, the rather unusual situation presented by the conditions of the study site, specifically that the two preserve islands are situated physically well above the potential barrier of a four-lane highway (Figure 5), must be taken into consideration when attempting to apply our results to generic situations. Although we did not determine the exact route of dispersing juveniles, the edge of Territory C-01-02 of the CalTrans parcel is composed of a rolling plateau that sits approximately 24 meters (80 feet) above I-8. Along its southern boundary is the cut slope that created the corridor through which I-8 passes (Figure 6). Along the northern edge of the Gatlin and Pembroke open space preserves is a steep cut slope that is its complement. A direct flight of 220 meters (735 feet), well within the flight capability of a juvenile Gnatcatcher (Fischer, Haas pers. obs.), could allow even this small passerine of limited flight capability to bypass both slopes and the divided four lane highway. Our results may have differed dramatically had the thoroughfare been situated atop the crest of a hill separating two "islands" of occupied habitat.

Given the above information, the current study adds modestly to our understanding of California Gnatcatcher biology and to the viability of the MSCP lands for long-term preservation of this species in the area covered. The sample size is very small, the work was limited to a single year during an unusual drought, and the results do not conflict with existing published information. However, the value of the positive results, the relative objectivity of the data, and its specificity to management of these particular sites add to its usefulness. Further, this study adds to the existing data and published studies, building a slightly broader base on which future studies on related issues can be built.

4.0 RECOMMENDATIONS

4.1 Needs at the Study Area Scale

1. It appears that the study area has at this point benefitted from only modest initial field efforts to compile the existing biological resources, functions, values, and management needs. It also appears that, as with many relatively new reserves adjacent to development, there may be substantial and specific disturbance threats present. Given that this impression is correct, we recommend a general reference evaluation ("baseline study") that will both document the existing resources and provide a prioritized list of needs for management that can be acted upon quickly if needed.

2. Because the current study was conducted during a single year with very unusual weather and there is only very limited information about the site in other regards, it is important not to lean heavily upon either

Figure 5: I-8 bisecting the two study areas

Figure 6: The I-8 corridor between the north (left side of picture) and south (right side of the picture) survey areas.

these results or generalizations drawn at larger scales to infer the biology or needs of California Gnatcatchers on the study area. In keeping with the identified potentially high importance of the study area to regional viability of the species, we recommend continued efforts to clarify at a local scale the general population parameters (productivity, survivorship, etc.) and the factors affecting them. This may suggest management measures which can have a relatively high benefit for their cost.

4.2 Needs of the Study Area at the MSCP Scale

A key concept of the MSCP is that successful conservation at larger scales is necessary to preserve resources at local scales, quite beyond issues of how well sites may be managed individually. Extending this idea specifically to viability of California Gnatcatchers at the study area we recommend consideration of two MSCP-scale efforts at a time frame of perhaps 5 to 15 years:

1. Conduct work to clarify the levels and patterns of natal dispersal that would be needed across the region in order to support continuation of the current genetic diversity and spatial structure in California Gnatcatchers. This may include a more explicit understanding of regional genetic diversity and a clearer understanding of factors at local and larger scales that affect those levels.

For example, recent modeling work suggests that in at least some species, the numbers of populations maintained (as opposed to concentrating efforts on the largest populations) may be more important for long-term viability than previously assumed (Neel and Cummings 2003). Evidence in the current patterns of genetic diversity of California Gnatcatchers in the region may suggest the relative importance of ensuring effective dispersal as short-term and mid-term management measures.

2. Conduct work to clarify the actual rates and patterns of natal dispersal occurring across various barriers and under varying conditions of productivity, weather, and environmental matrices (i.e., the surrounding "dispersal habitats"). It appears reasonable to hope that such information will allow conservationists to make choices for the maximum effectiveness of limited funding resources.

5.0 ACKNOWLEDGMENTS

The field work and this report were provided under Contract No. 44918 to the County of San Diego, Department of Parks and Recreation. The following people were instrumental in developing the scope of work and funding: Christine Fritz and David Lawhead at the California Department of Fish and Game, Clark Winchell at U.S. Fish and Wildlife Service, and Mark Webb and Maeve Hanley at the County of San Diego. We thank Fred Roberts for vegetation mapping and Martin Ross at the County of San Diego for GIS work and preparation of the vegetation map. John Reseck at Campbell BioConsulting, Inc. And Kylie Fischer of Varanus Biological Services, Inc. prepared additional graphics.

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Appendix A

Study Area Photographs

Figure A-1: Fledgling California Gnatcatcher

Figure A-2: Juvenile California Gnatcatcher

Figure A-3: California Gnatcatcher Nest

Figure A-4: South Study Area

Figure A-5: South Study Area

Figure A-6: North Study Area

Figure A-7: Non-breeding Season Habitat

Appendix B

Rainfall and Temperature Data

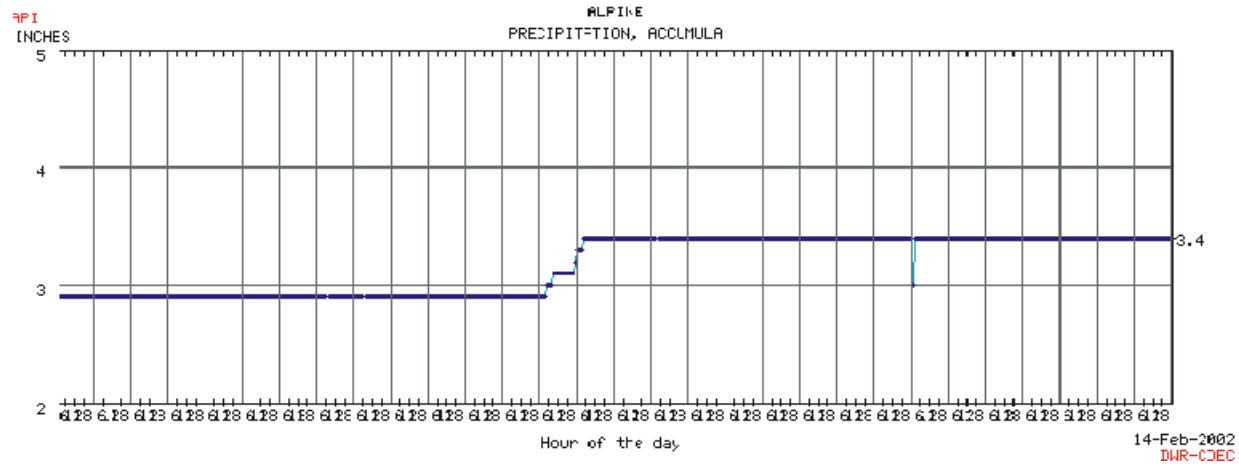


Figure B-1: Daily Rainfall Data 15 January 2002 through 15 February 2002

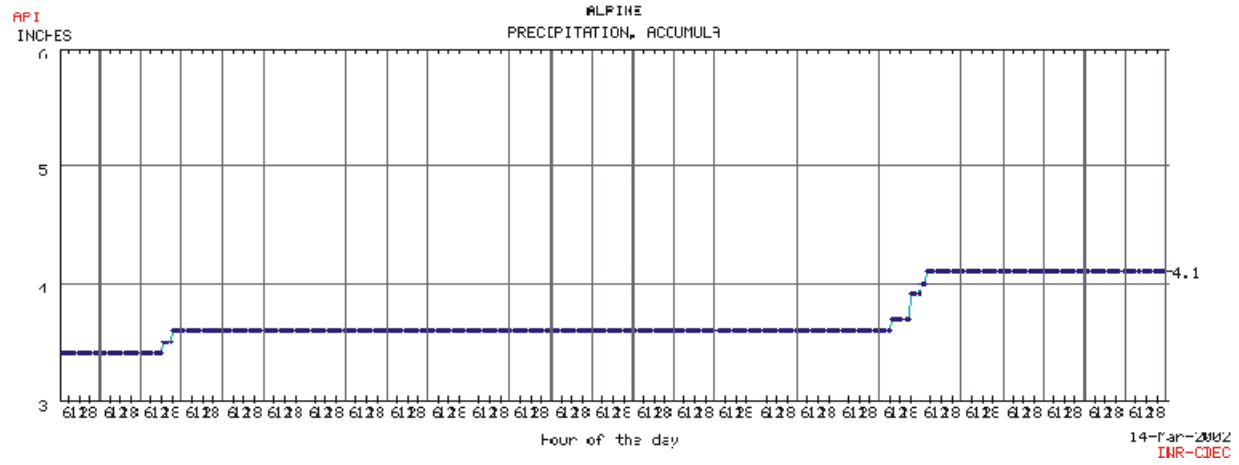


Figure B-2: Daily Rainfall Data 15 February 2002 through 14 March 2002

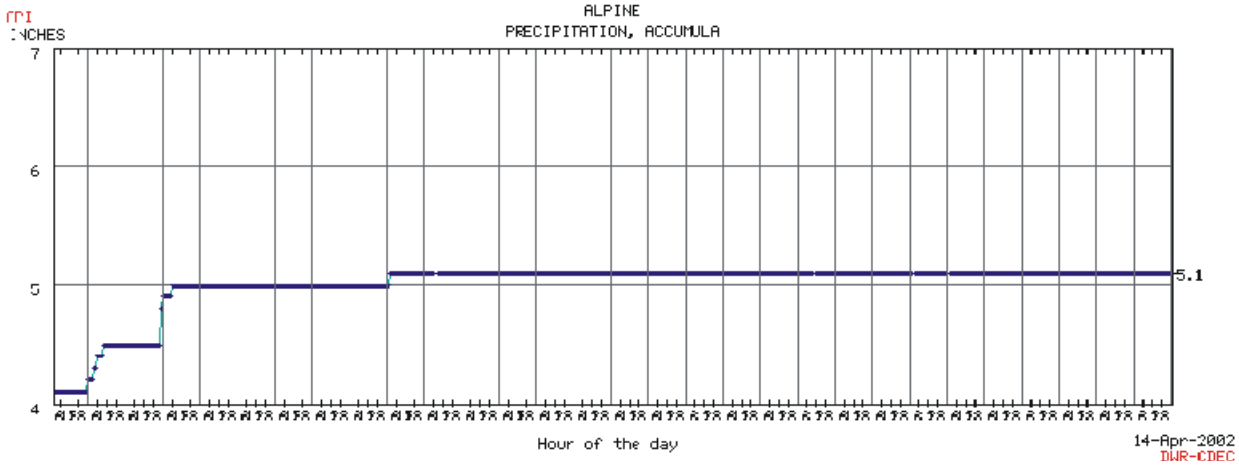


Figure B-3: Daily Rainfall Data 15 March 2002 through 14 April 2002

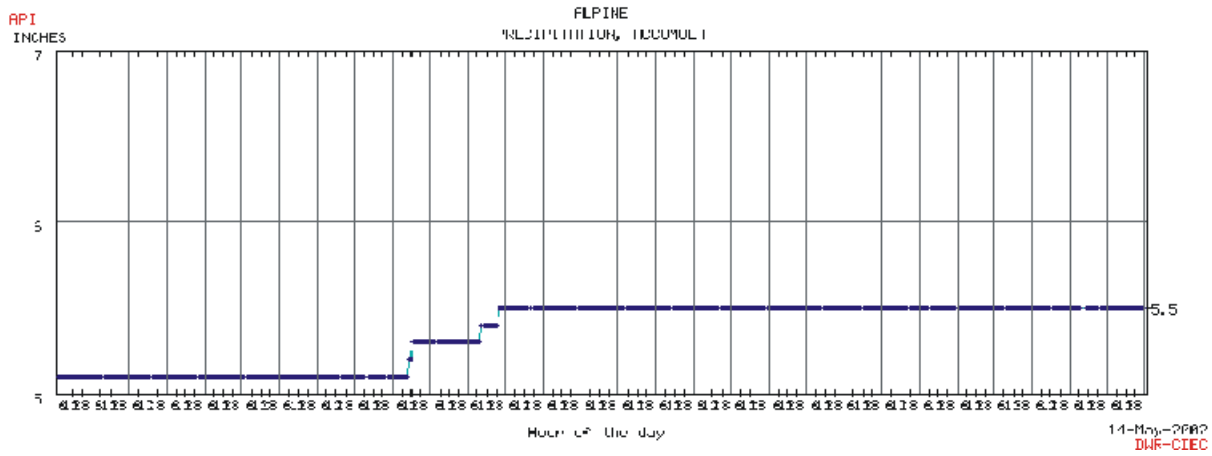


Figure B-4: Daily Rainfall Data 15 April 2002 through 14 May 2002

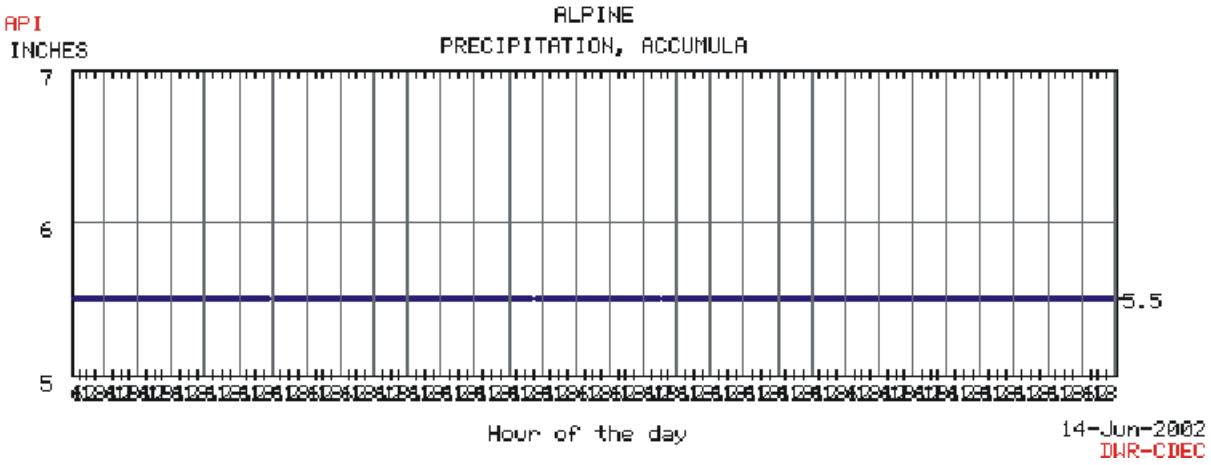


Figure B-5: Daily Rainfall Data 15 May 2002 through 14 June 2002

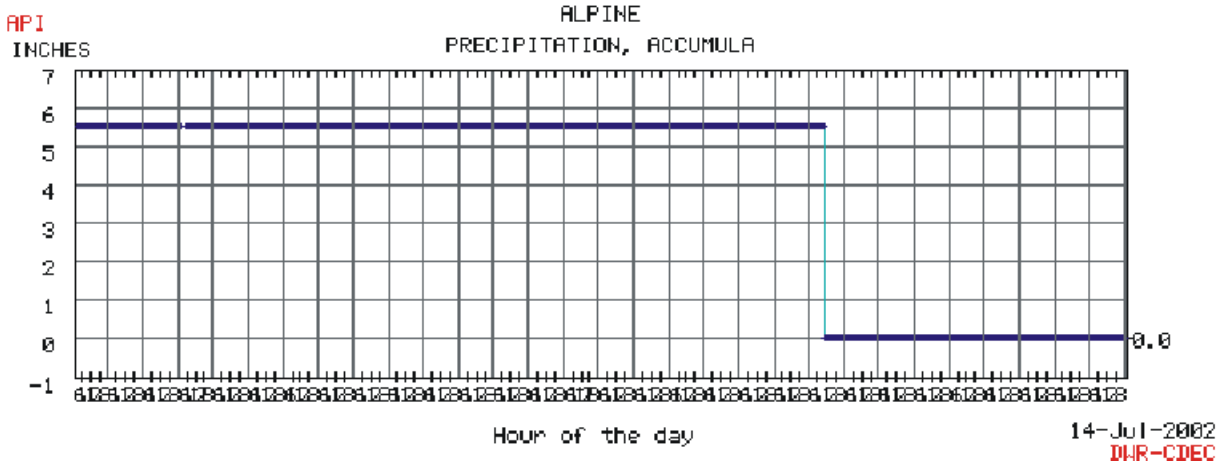


Figure B-6: Daily Rainfall Data 15 June 2002 through 14 July 2002

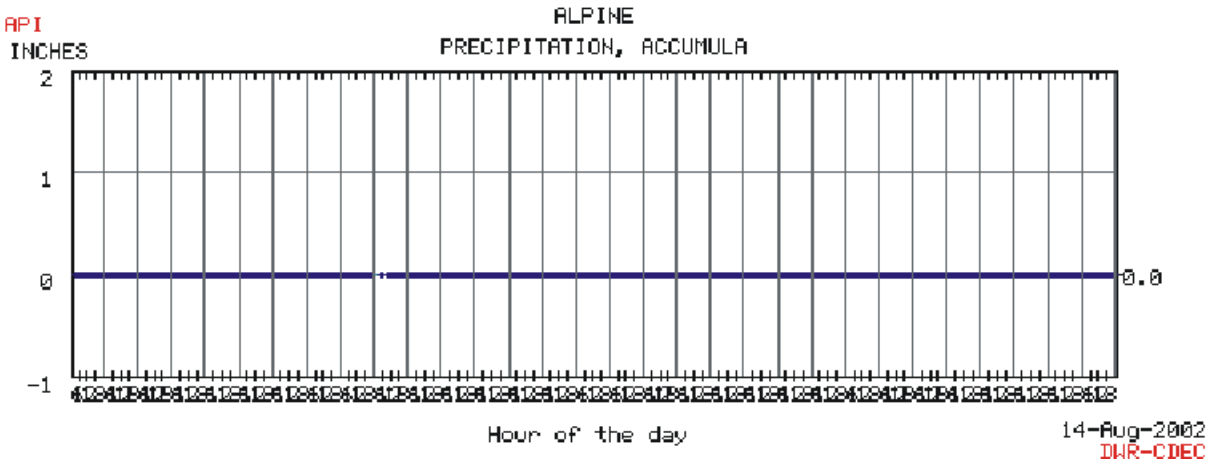


Figure B-7: Daily Rainfall Data 15 July 2002 through 14 August 2002

Figure B-8: Daily Rainfall Data 15 August 2002 through 14 September 2002

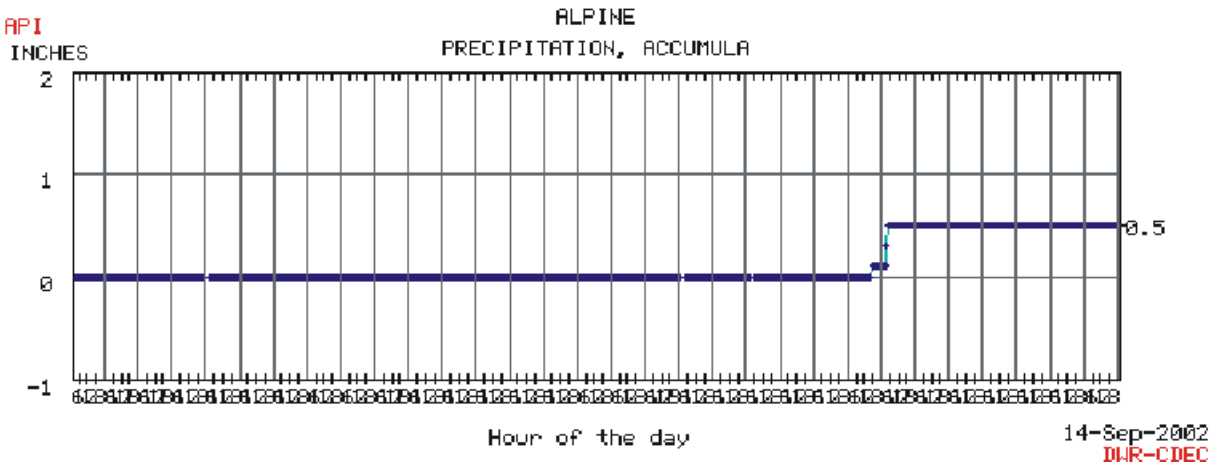
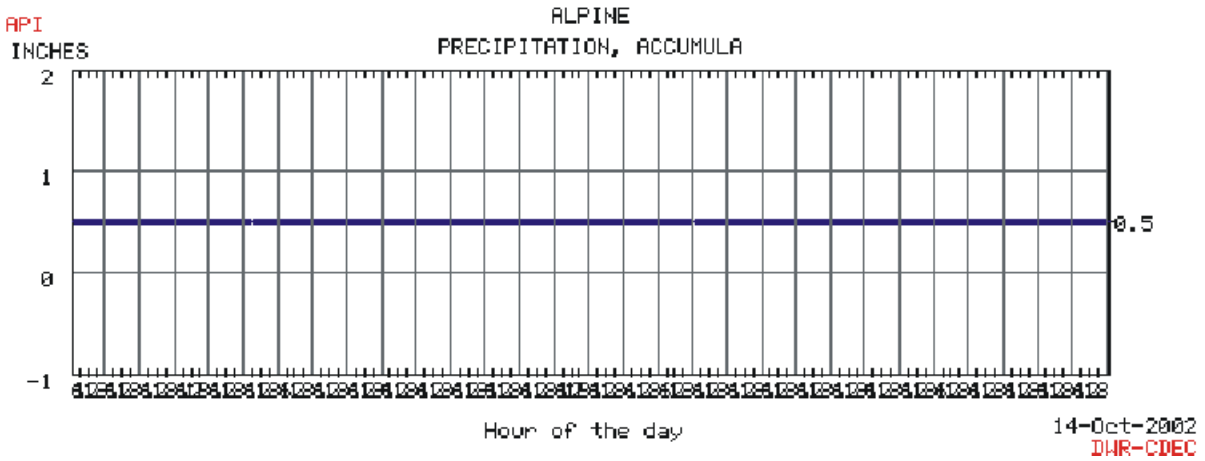


Figure B-9: Daily Rainfall Data 15 September 2002 through 14 October 2002



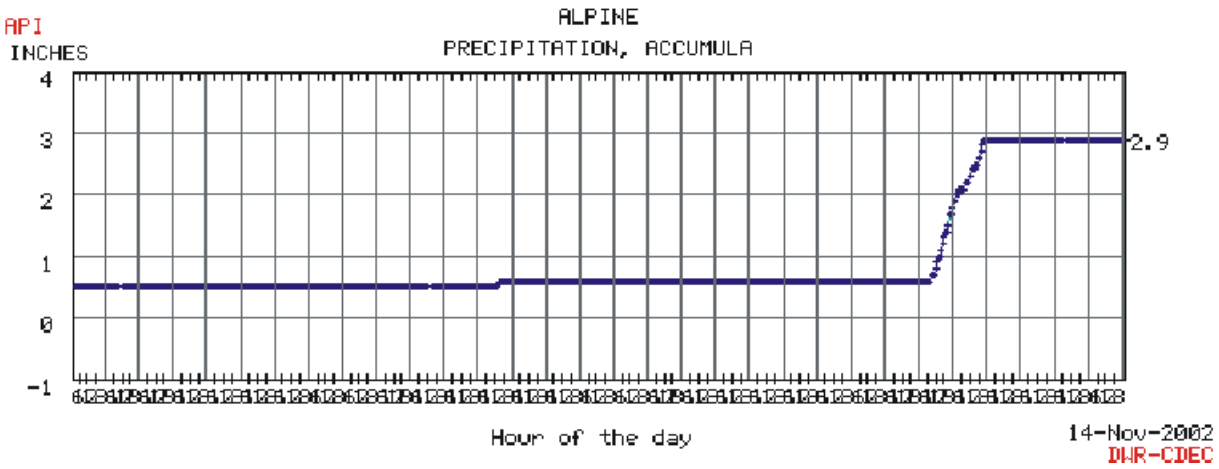
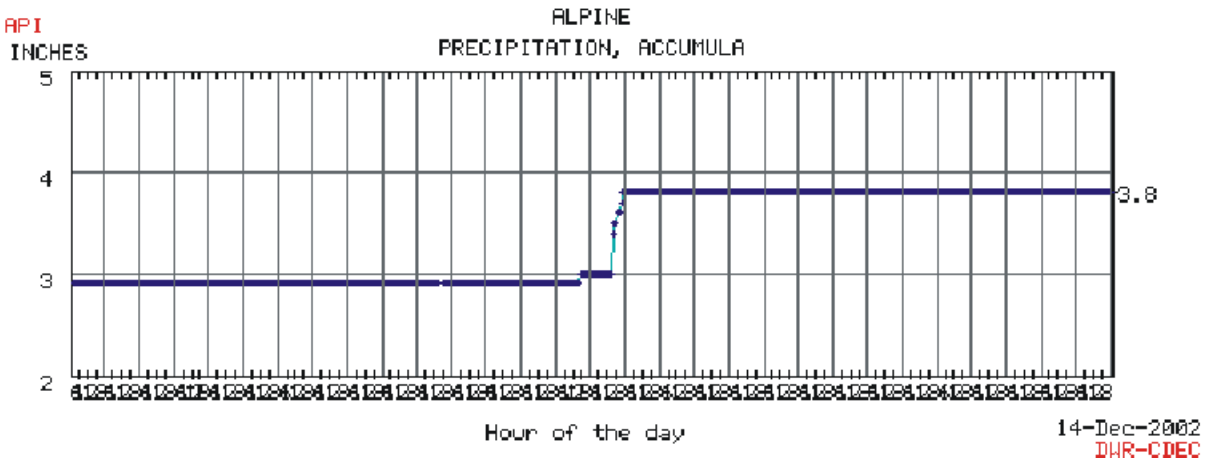


Figure B-10: Daily Rainfall Data 15 October 2002 through 14 November 2002

Figure B-11: Daily Rainfall Data 15 November 2002 through 14 December 2002



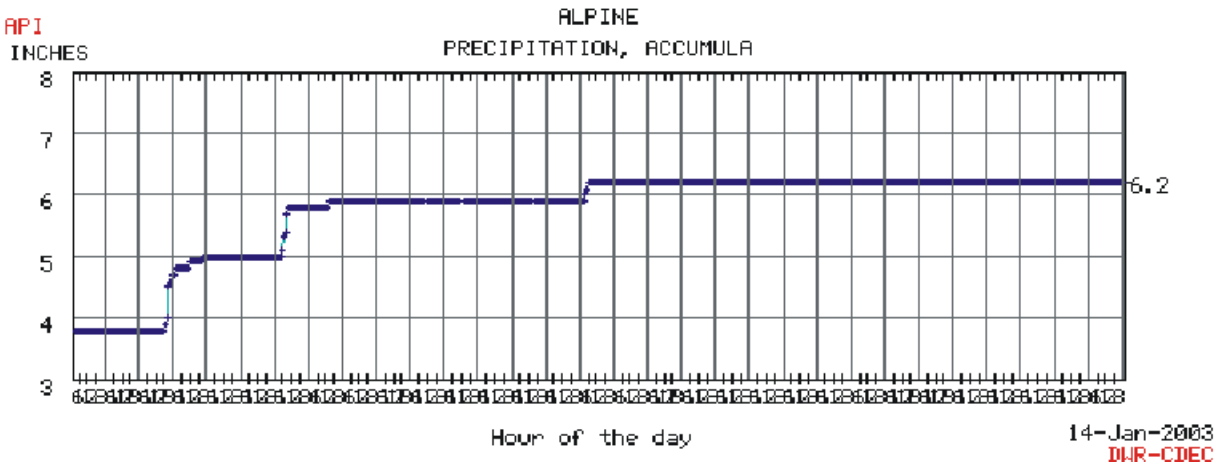


Figure B-12: Daily Rainfall Data 15 December 2002 through 14 January 2003

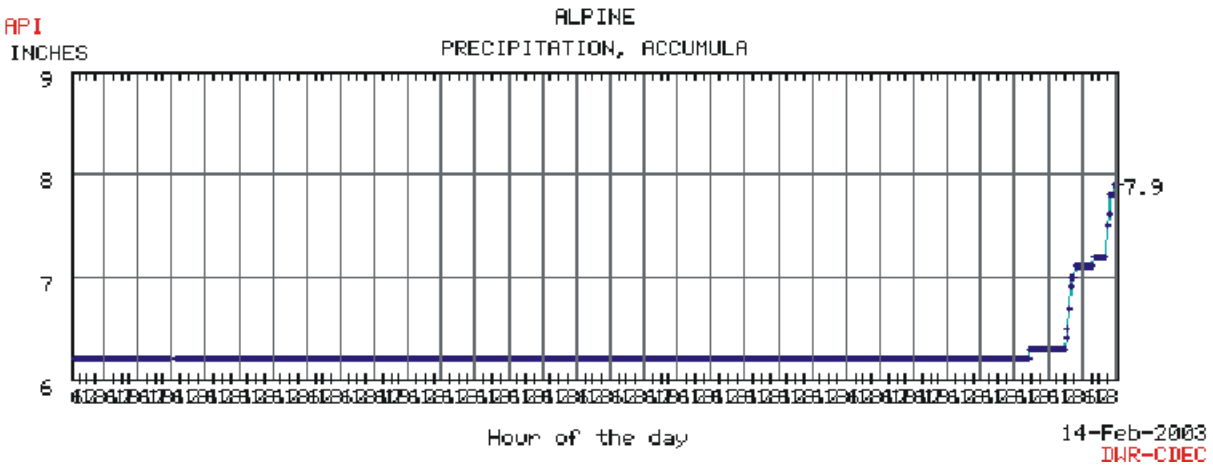


Figure B-13: Daily Rainfall Data 15 January 2003 through 14 February 2003

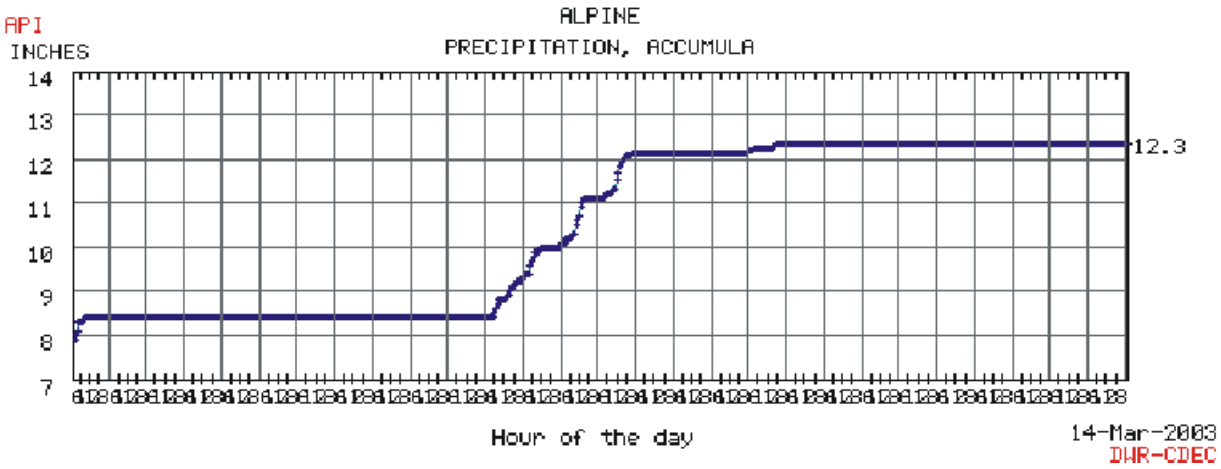


Figure B-14: Daily Rainfall Data 15 February 2003 through 15 March 2003

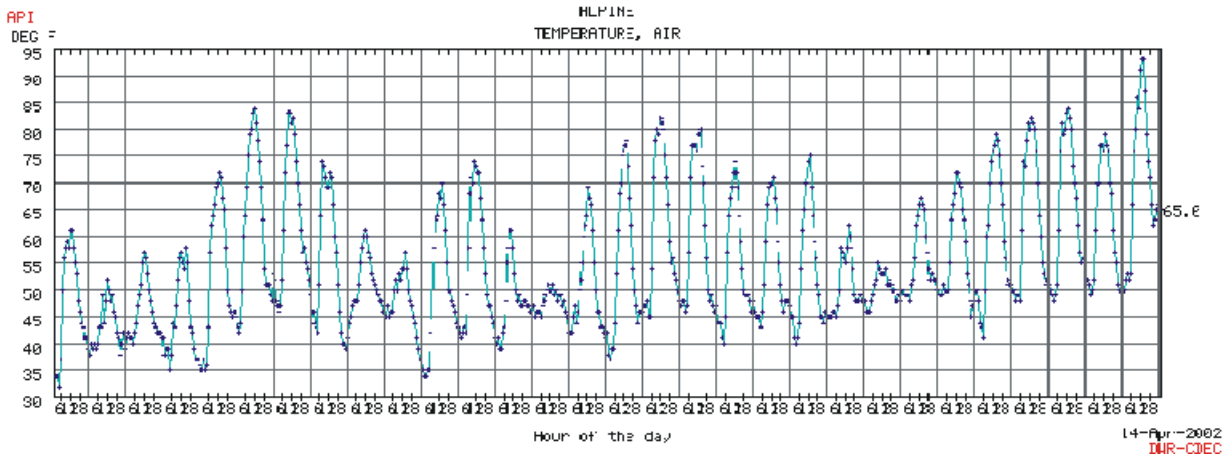


Figure B-15: Daily Temperature Data 15 March 2002 through 14 April 2002

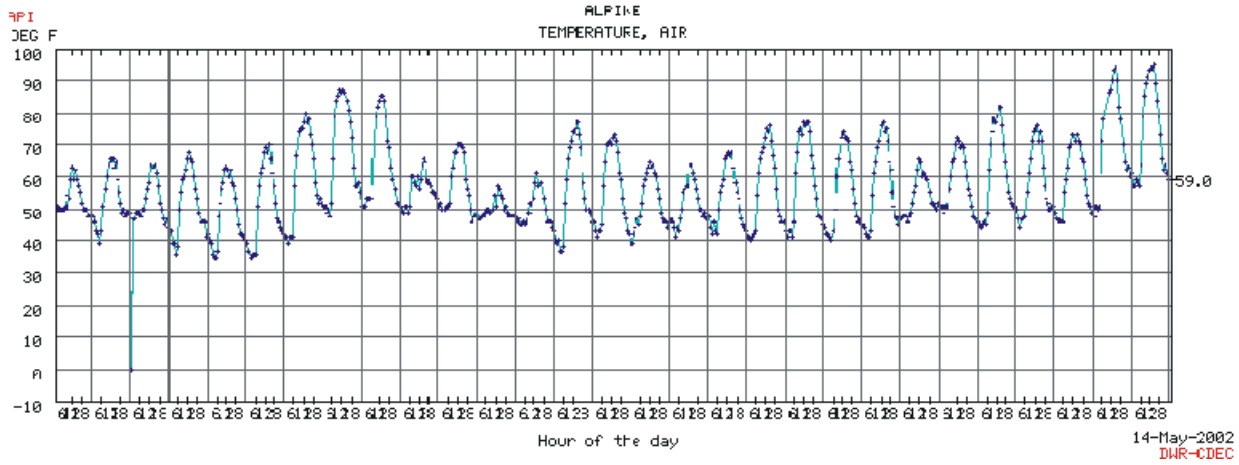


Figure B-16: Daily Temperature Data 15 April 2002 through 14 May 2002

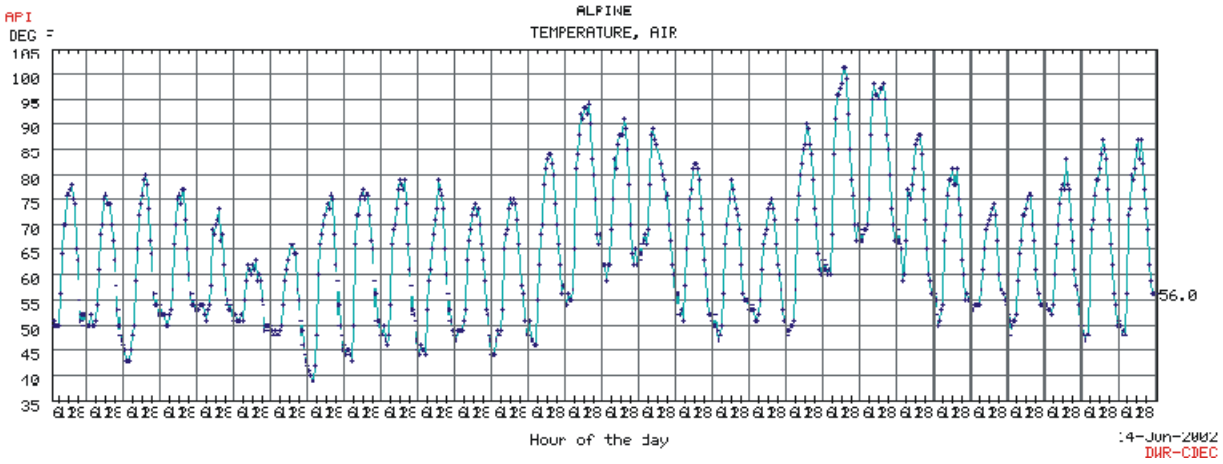
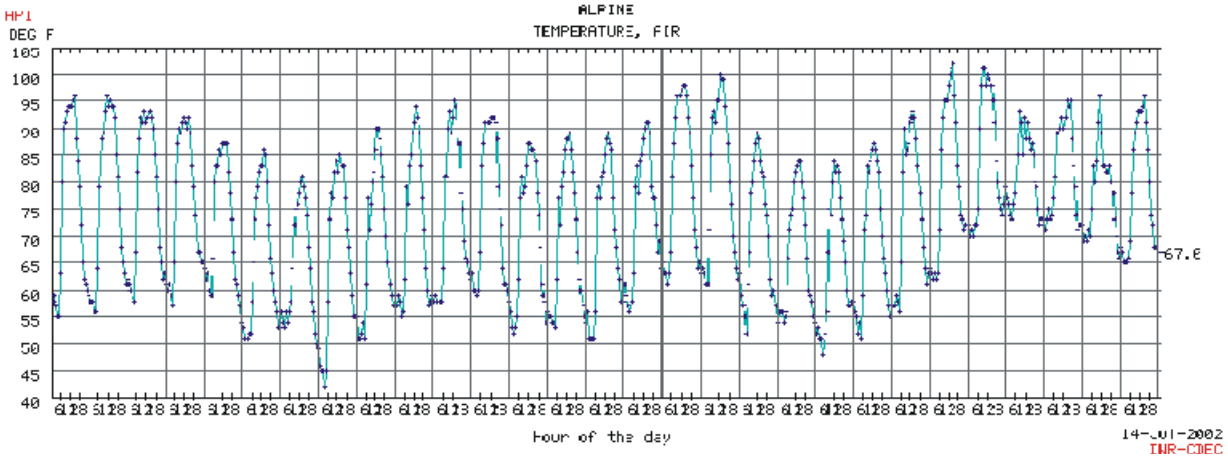


Figure B-17: Daily Temperature Data 15 May 2002 through 14 June 2002

Figure B-18: Daily Temperature Data 15 June 2002 through 14 July 2002



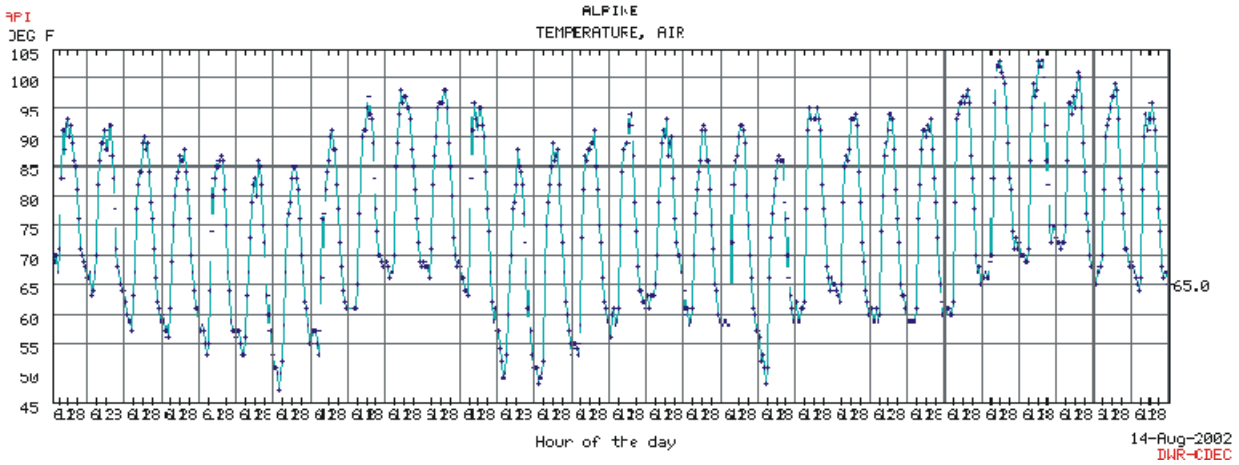


Figure B-18: Daily Temperature Data 15 July 2002 through 14 August 2002

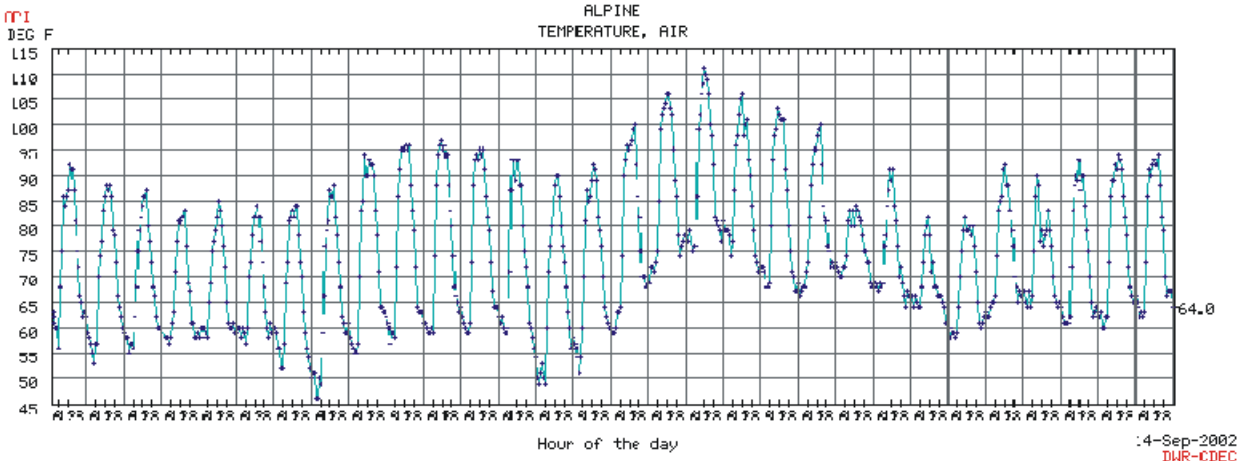


Figure B-19: Daily Temperature Data 15 August 2002 through 14 September 2002

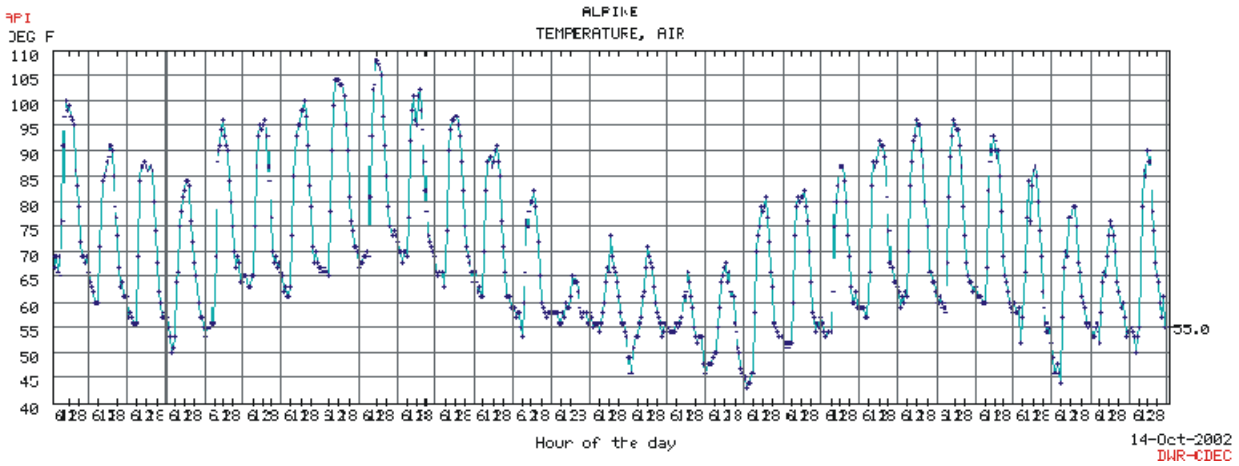


Figure B-20: Daily Temperature Data 15 September 2002 through 14 October 2002

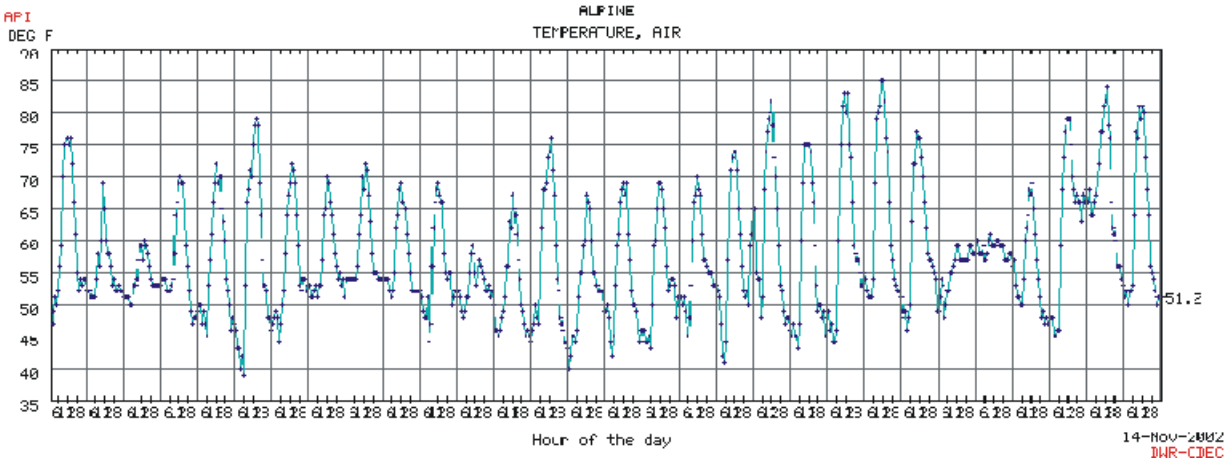


Figure B-21: Daily Temperature Data 15 October 2002 through 14 November 2002

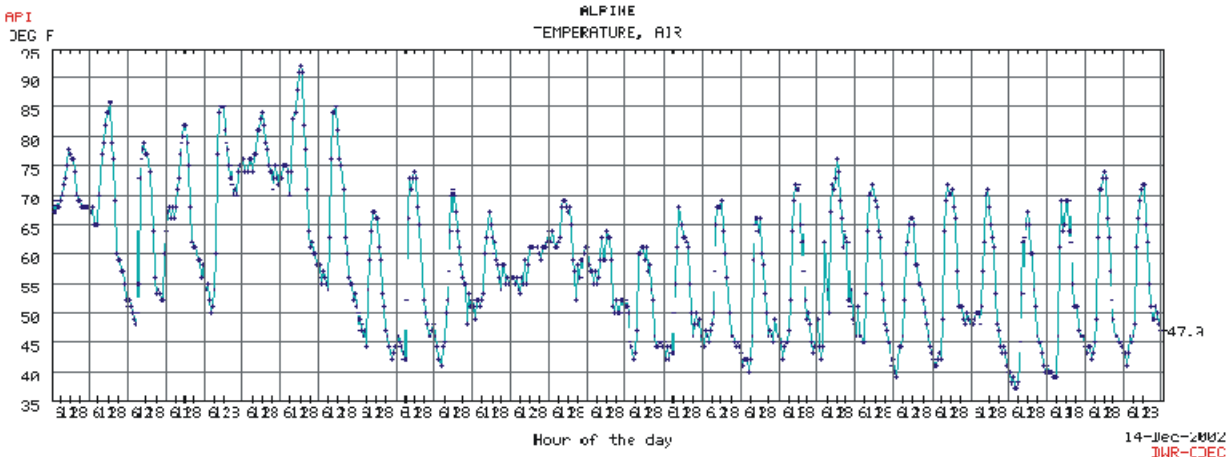


Figure B-22: Daily Temperature Data 15 November 2002 through 14 December 2002

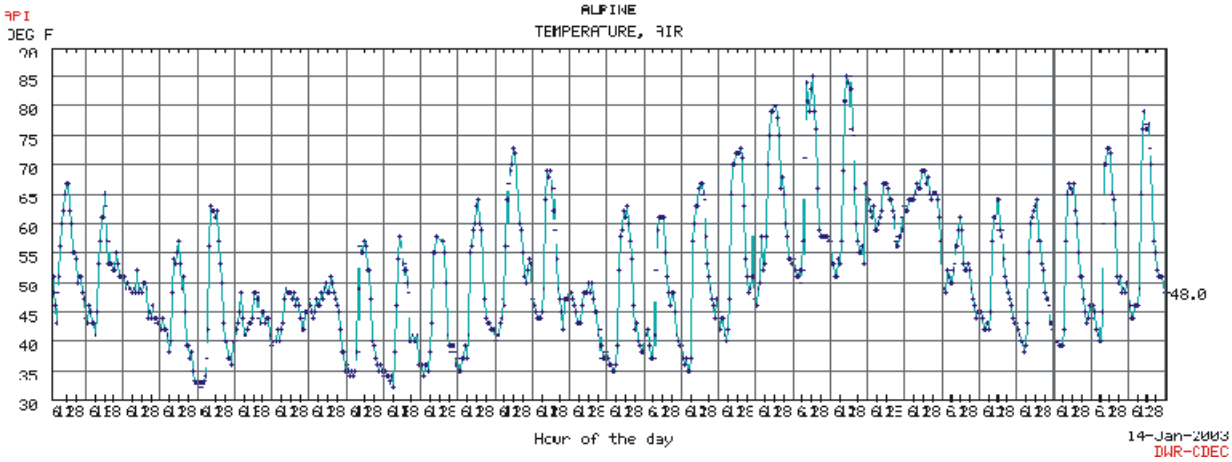


Figure B-23: Daily Temperature Data 15 December 2002 through 14 January 2003

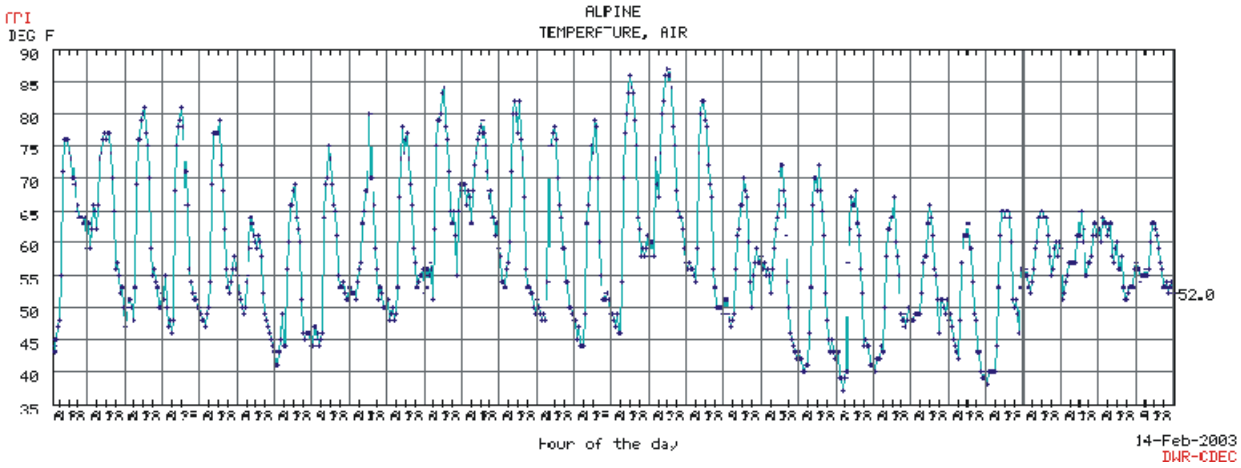
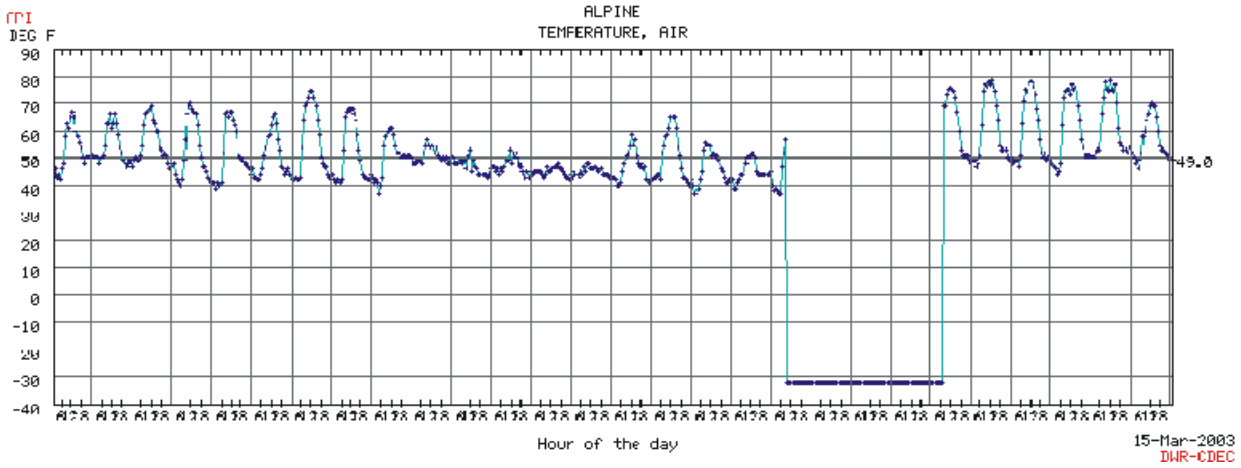


Figure B-24: Daily Temperature Data 15 January 2003 through 14 February 2003

Figure B-25: Daily Temperature Data 15 February 2003 through 15 March 2003



Appendix C

Study Area Visits

Date	Start Time	End Time	Temperature	Cloud Cover	Wind	Study Area
3-22-02	0730	1145	53° F.	0%	0 mph	South
3-27-02	0645	1155	56° F.	100%	0 mph	North & South
4-1-02	0805	1045	60-70° F.	98-2%	0-3 mph	South
4-4-02	0745	1145	60-70° F.	60-0%	0-3 mph	South
4-9-02	0825	1115	64°F	0%	0-3 mph	North
4-15-02	0750	1110	56-65° F.	10-70%	0-3 mph	South
4-23-02	0700	1030	55-68° F.	10-60%	0-2 mph	North
4-24-02	0630	1045	55-68° F.	10-80%	1-3 mph	South
4-29-02	0715	1110	56-72° F.	0%	0-3 mph	North & South
5-2-02	1330	1540	65-67° F.	0-10%	1-4 mph	South (banding/no survey)
5-9-02	0700	1015	61-62° F.	100-0%	0 mph	South
5-17-02	0630	1120	58-61° F.	100%	0 mph	North & South
5-23-02	0635	0955	57-62° F.	0%	0-3 mph	South
5-30-02	0630	1100	58-63° F.	0%	1-5 mph	North & South
6-11-02	0645	0935	64-65° F.	100-30%	0 mph	North
7-3-02	0600	0950	62°F	100%	0 mph	South
7-15-02	0935	1310	71-89° F.	15-40%	0-5 mph	North
7-23-02	0620	1010	63-75° F.	0%	0-3 mph	North & South
9-12-02	0650	0905	62-69° F.	0%	0 mph	North
9-13-02	0650	0950	63-72° F.	0%	0-3 mph	South
10-3-02	0740	1115	54-69° F.	0%	0 mph	North & South
10-4-02	0710	1030	54-67° F.	0%	0-1 mph	South
10-23-02	0715	0930	59-62° F.	100-90%	0-3 mph	South
10-24-02	0725	0920	58-62° F.	100%	0 mph	North
11-7-02	0630	0915	50-60° F.	45%	0 mph	North & South
11-25-02	0825	0955	54-55° F.	100-60%	0 mph	South
12-10-02	0720	1015	49-53° F.	100-0%	0-1 mph	South
12-23-02	0845	1145	45-53° F.	0%	0 mph	South
1-6-03	0705	0935	53-70°F	0%	5-30 mph	North & South
1-21-03	0850	1010	58-63° F.	100-0%	0-3 mph	North
1-23-03	0715	1015	56-60° F.	70-100%	0 mph	South
3-6-03	0710	1020	47-63° F.	0%	0-3 mph	South
3-7-03	0710	0930	48-70° F.	0%	0-3 mph	North
3-11-03	0700	0935	53-70° F.	0%	0 mph	South
3-12-03	0700	0930	53-66° F.	100-0%	0 mph	North

Appendix D

Vertebrate Faunal List

Amphibians	
Garden slender salamander	*Batrachoseps major*
Pacific chorus (tree) frog	*Pseudacris (Hyla) regilla*
Western spadefoot (SSC)	*Spea hammondii*
Reptiles	
San Diego alligator lizard	*Elgaria multicarinata webbii*
Orangethroat whiptail (SSC)	*Cnemidophorus (Aspidoceles) hyperythrus*
California side-blotched lizard	*Uta stansburiana elegans*
San Joaquin fence lizard	*Sceloporus occidentalis biseriatus*
California striped racer	*Masticophis lateralis lateralis*
San Diego gopher snake	*Pituophis catenifer annectens*
California kingsnake	*Lampropeltis getula californiae*
Southern pacific rattlesnake	*Crotalus oreganus helleri*
Red diamond rattlesnake (SSC)	*Crotalus ruber*
Mammals	
San Diego pocket gopher	*Thomomys bottae sanctidiegi*
Deer mouse	*Peromyscus maniculatus*
Cactus mouse	*Peromyscus eremicus*
Desert (Audubon) cottontail	*Sylvilagus auduboni*
California ground squirrel	*Spermophilus beecheyi nudipes*
Striped skunk	*Mephitis mephitis*
Gray fox	*Urocyon cinereoargenteus*
Coyote	*Canis latrans*
Dog	*Canis familiaris*
Horse	*Equus caballos*

Common Name	Scientific Name
Birds	
Turkey vulture	*Cathartes aura*
Mallard	*Anas platyrhynchos*
Osprey (SSC)	*Pandion haliaetus*
Cooper's hawk (SSC)	*Accipiter cooperii*
American kestrel	*Falco sparverius*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicenis*
California quail	*Callipepla californica*
Killdeer	*Charidrius vociferus*
Ring-billed gull	*Larus delawarensis*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Red-crowned parrot	*Amazona viridigenalis*
Vaux's swift (SSC)	*Chaetura vauxi*
White-throated swift	*Aeronautes saxatalis*
Anna's hummingbird	*Calypte anna*
Costa's hummingbird	*Calypte costae*
Black-chinned hummingbird	*Archilochus alexandri*
Unidentified *Selasphorus* hummingbirds	*Selasphorus* spp.
Rufous hummingbird	*Selasphorus rufus*
Acorn woodpecker	*Melanerpes formicivorus*
Nuttall's woodpecker	*Picoides nuttallii*
Western flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Say's phoebe	*Sayornis saya*
Cassin's kingbird	*Tyrranus vociferans*
Western kingbird	*Tyrranus verticalis*
Warbling vireo	*Vireo gilvus*
Western scrub-jay	*Aphelocoma californica*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Cedar waxwing	*Bombycilla cedrorum*
European starling	*Sturnus vulgaris*
Northern mockingbird	*Mimus polyglottos*
American robin	*Turdus migratorius*

Common Name	Scientific Name
Hermit thrush	*Cathartes guttatus*
California thrasher	*Toxostoma redivivum*
Bewick's wren	*Thryomanes bewickii*
House wren	*Troglodytes aedon*
Blue-gray gnatcatcher	*Polioptila caerulea*
California gnatcatcher (SSC, FT)	*Polioptila californica*
Bushtit	*Psaltriparus minimus*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Barn swallow	*Hirundo rustica*
Cliff swallow	*Petrochelidon pyrrhonota*
Wrentit	*Chamaea fasciata*
Lesser goldfinch	*Carduelis psaltria*
House finch	*Carpodacus mexicanus*
Fox sparrow	*Passerella iliaca*
White-crowned sparrow	*Zonotrichia leucophrys*
Golden-crowned sparrow	*Zonotrichia atricapilla*
So. Cal. rufous-crowned sparrow (SSC)	*Aimophila ruficeps canescens*
Spotted towhee	*Pipilo maculatus*
California towhee	*Pipilo crissalis*
Nashville warbler	*Vermivora ruficapilla*
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Wilson's warbler	*Wilsonia pusilla*
Red-winged blackbird	*Agelaius phoeniceus*

Appendix E

Copies of Applicable Permits and Memoranda

Appendix F

Quarterly Reports

Report of Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands,
San Diego County, California
Varanus Biological Services/Campbell BioConsulting
15 June 2003

California Gnatcatcher Distribution

in the Lakeside Area

of the County of San Diego

Quarterly Report

June 2002

Contract Number 44918

Prepared by:

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Introduction

Campbell BioConsulting contracted Varanus Biological Services, Inc. (Varanus) to monitor nests of, band the juveniles of, and conduct surveys for dispersing California gnatcatchers (*Polioptila californica,* CaGn) at two properties located in Lakeside, San Diego County, California. The study area is within the Metro Lakeside-Jamul Segment of the County of San Diego's Multiple Species Conservation Plan (MSCP) Subarea Plan. It is situated within the Lakeside Community Planning Area of San Diego County, and consists of approximately 200 acres of publicly and privately owned lands in the United States Geological Survey (USGS) 7.5' minute El Cajon map, El Cajon Rancho; Township 15 South, Range 1 East. The specific study sites occur north and south of Interstate 8 (I-8). To the south of I-8 the study area includes portions of the Gatlin mitigation parcel (APN 401-191-03) and the Pembroke mitigation parcel (APN 401-010-03,02). North of I-8 the study sites include the CalTrans mitigation site (APN 400-070-05) and a portion of the Crestridge Ecological Reserve.

The elevation at the study sites ranges from 600 and 1000 feet. Soils on-site are primarily Cieneba (CmrG), and Vista (VvG), (VsE), (VsG). The sites are hilly with steeper slopes descending to I-8 and Los Coches Road in the southern parcels, and more gently rolling slopes in the northern parcels. This area is identified by the wildlife agencies and the County as an area that contains "Very High Quality" habitat for the California gnatcatcher and in addition provides linkage to like habitat types.

Purpose

The study design is the product of the collaborative efforts of Dave Lawhead (California Department of Fish and Game, DFG) and Clark Winchell (U. S. Fish and Wildlife Service, FWS). The funding source is the DFG in support of the County of San Diego, Dept. of Parks and Recreation (County). The study purpose is to address the question of whether CaGn cross I-8 at this location. This is viewed as a potentially important question at the MSCP scale due to the study area serving as either a dispersal corridor or a dispersal barrier between the North County and South County populations of the California gnatcatcher.

Task Description

The California gnatcatcher is a resident of the coastal plain in southern California. It's primary habitat is coastal sage scrub (CSS). Little is known about its regional population dynamics or dispersal patterns, or how capable it is of moving across large landscape barriers. Baseline data on the distribution, abundance, and habitat usage in these MSCP areas is lacking. This study will provide data establishing current conditions and will facilitate future monitoring of this species in the area.

The primary goal of our study is to evaluate whether California gnatcatcher movement across I-8 is occurring, and to assess if this area is acting as a functional corridor as it is assumed to be in the MSCP Subarea Plan. This two-year study entails monitoring of color banded birds to determine the distribution of and to document dispersal of juvenile California gnatcatchers between the Gatlin and Pembroke mitigation areas (south of I-8) and the CalTrans mitigation site (north of I-8).

The Study and Tasks

Hypothesis

The California gnatcatcher does not traverse I-8 in the vicinity of the study area.

Objective

The objective is to test the hypothesis that the California gnatcatcher does not traverse I-8 in the vicinity of the study area by marking a sample population and following the marked individuals over a two-year period to determine if dispersal occurs between suitable habitats separated by the interstate.

Study Area

The study areas, described above, are located adjacent to I-8. Habitat is coastal sage scrub of various associations (e.g., white sage dominated, California buckwheat dominated). Each study area has a minimum of two pairs of California gnatcatchers.

Methods

March 01st – May 31st 2002

Varanus personnel have visited the study area weekly beginning 7 March 2002. On 7 March Biologists Kylie Fischer and William Haas met with Kurt Campbell (Campbell BioConsulting), and Maeve Hanley and Mark Webb (County of San Diego) to inspect the site and to delineate the study areas. On subsequent visits Fischer and Haas conducted surveys by walking meandering transects through each site to locate all California gnatcatcher breeding pairs. Based on behavioral cues (e.g., carrying nest material, repeated visits to a specific area) we located active nest sites. Once nest sites were found, we mapped nest sites using a Global Positioning System (GPS) handheld recorder. We determined approximate age of (± 1 day) and banded nestlings from the study area between the ages of 7 (seven) – 9 (nine) days post hatching. We placed one numbered U.S. Geological Survey (USGS) aluminum band and one celluloid color band, one per leg, on each nestling. Through 31 May our methods included only banding of locals (nestlings) as indicated. Based on our assessment of the rapidly drying habitat we decided that all future banding in 2002 will involve mist netting and banding of fledglings in order to avoid all contact with active nests. Once we had a sample of banded birds, during each site visit we attempted to locate and record the locations of all color marked birds noting the complete color band combination if discernable.

Personnel

William E. Haas (TE-779910) and Kylie Fischer (TE-039321) conducted all surveys, nest searches, and nest monitoring. William Haas banded all gnatcatchers, assisted by Kylie Fischer.

Results

March 01st - May 31st

Varanus personnel have detected seven pairs of California gnatcatchers, five on the south side of I-8 and two on the north side of I-8. We have found a total of eleven nests, at least one nest for each pair and two nests for five of the pairs (Appendix 1). Probably related to the extremely dry winter (one of the driest in the recorded history of San Diego weather), gnatcatcher breeding activity was delayed. We found the first gnatcatcher nest on 15 April. Based on our data from more than 400 California gnatcatcher nests, this is approximately one month later than the average first nesting

date we recorded between 1992 and 2000. We have also noted reduced breeding activity levels (late onset of breeding or even a lack thereof) in other sage scrub passerines species present within the study areas. Similar results have been reported from elsewhere in the county (Philip Unitt pers. com.)

To date, we have banded four chicks, three from nest W-01a-02 (WalMart parcel, pair 01, nest a (= nest 1), year 2002) and one from W-04a-02. Of the four chicks banded one is known to have fledged from its nest. From nest W-04a-02 the successful fledge bears a silver USGS band on its right leg and an orange band on its left.

Discussion

Banding

Conditions throughout southern California are extremely dry. Our study site is no exception. We rarely find even early morning dew on coastal sage scrub vegetation. Because of the dry conditions, much of the vegetation has become senescent; halting vegetative growth, exfoliating, and little in the way of providing protective or cryptic cover. At this time we are hesitant to approach and thus band chicks at the nest. We believe that, under current conditions, human scent left in the vicinity of a nest lingers for a greater time period. With little cover available, this leaves the nest and young in a very precarious predicament. For any subsequent nests that we find, we will band fledglings within two weeks of leaving the nest. In order to capture the fledglings we will use mist nets. This is typically a safer, more effective means of banding young, however it is typically more time consuming than banding at the nest. We feel the protection afforded the young warrants the additional time expenditure.

Threats

We have documented a high level of disturbance to the area, primarily due to the presence of humans living at the site. Refuse at the site has continued to mount. Other causes of disturbance include bicycle, all terrain vehicle, and motorcycle activity; dogs and ponies exercised "off-leash"; and other transient uses of each site. One individual disclosed that he has cut trails for the mountain bikers, hunts rattlesnakes, collects horned lizards, and feeds ravens and hummingbirds. Other potential dangers include the threat of wildfire. There are numerous fire rings (to cook food and probably to also provide warmth at night) and the residents are frequently observed smoking.

Appendix 1: **Gnatcatcher Nesting Data, By Nest Number**

Nest Number
C-01A-02

Species	**Map Coordinates**
Eriogonum fasciculatum	

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Pair foraging	Kylie Fischer (KF)
09-Apr-02				Pair foraging throughout eastern half of parcel	Kylie Fischer
23-Apr-02				Pair foraging throughout eastern half of parcel	Kylie Fischer
29-Apr-02				Nest found, 25%, male building	Kylie Fischer
17-May-02				Nest abandoned	Kylie Fischer

Nest Number
C-01B-02

Species	**Map Coordinates**
Baccharis sarothroides	

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
17-May-02	2			Male incubating eggs, did not flush male	Kylie Fischer
30-May-02		2		Pair feeding chicks	William Haas (WH)

Nest Number
C-02A-02

Species	**Map Coordinates**

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Pair foraging	William Haas
09-Apr-02				Nest found, pair building	William Haas
23-Apr-02				Nest abandoned	William Haas

Nest Number
C-02B-02

Species	**Map Coordinates**
Eriogonum fasciculatum	

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
29-Apr-02				No sign of pair	Kylie Fischer
17-May-02				Nest found, Pair building	William Haas
30-May-02				Female on nest. Unknown number of eggs	William Haas

Nest Number
W-01A-02

Species	**Map Coordinates**
Eriogonum fasciculatum	

Parcel
Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
07-Mar-02				Hear CAGN	WH/KF
22-Mar-02				No sign	Kylie Fischer
27-Mar-02				No sign	WH/KF
01-Apr-02				Pair foraging	WH/KF
04-Apr-02				Pair moves togeter in a limited area. Nest site searching?	William Haas
15-Apr-02				Nest found near observation point from previous visit, female incubating	William Haas

24-Apr-02	3		3 eggs	William Haas
29-Apr-02		3	3 chicks day 3-4	Kylie Fischer
02-May-02		3	Banded 3 chicks - day 6	Kylie Fischer
09-May-02			Nest in perfect condition but empty. Fate of chicks unknown.	Kylie Fischer

Nest Number
W-01B-02

Species **Map Coordinates**

Parcel

Salvia apiana

Walmart

Number of:

Date	Eggs	Chicks	Fledges	Comments	Observer
09-May-02				Pair building nest, taking material from old nest. Nest 90%	Kylie Fischer
17-May-02				Nest looks intact, but pair not in vicinity; calling far away	WH/KF
23-May-02				Nest abandoned, pair foraging in NE corner of parcel	WH/KF
30-May-02				Pair foraging	William Haas

Nest Number
W-02A-02

Species **Map Coordinates**

Parcel

Baccharis sarothroides

Walmart

Number of:

Date	Eggs	Chicks	Fledges	Comments	Observer
01-Apr-02				Nest found, 50%, both adults building	William Haas
04-Apr-02				Pair still building, 90%	Kylie Fischer
15-Apr-02	2			Female on nest	Kylie Fischer
29-Apr-02				Nest depredated, no sign of pair	Kylie Fischer

Nest Number
W-02B-02

Species **Map Coordinates**

Parcel

Eriogonum fasciculatum

Walmart

Number of:

Date	Eggs	Chicks	Fledges	Comments	Observer
09-May-02				Male calling constantly.	Kylie Fischer
17-May-02				Pair present, suspect new nest area	William Haas
23-May-02				Male scolding in area of Baccharis sarothroides. Pair foraging together later.	WH/KF
30-May-02				Pair building in Eriogonum in NW corner of parcel	William Haas

Nest Number
W-03A-02

Species **Map Coordinates**

Parcel

Eriogonum fasciculatum

Walmart

Number of:

Date	Eggs	Chicks	Fledges	Comments	Observer
07-Mar-02				hear CAGN	WH/KF
22-Mar-02				pair foraging	William Haas
01-Apr-02				pair foraging	William Haas
04-Apr-02				Pair present	WH/KF
15-Apr-02				Nest found near trail approximately half way up the slope.	William Haas
29-Apr-02				Nest abandoned or depredated, calls heard downslope	Kylie Fischer
09-May-02				Unsure of location or if neighboring pair	Kylie Fischer
17-May-02				a few calls	William Haas
23-May-02				pair foraging	William Haas
30-May-02				Pair quiet and staying low in vegetation	William Haas

Nest Number
W-04A-02

Species Artemisia californica

Map Coordinates

Parcel
Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
01-Apr-02				possible pair	William Haas
04-Apr-02				pair foraging	Kylie Fischer
15-Apr-02				Pair building nest, 90% complete	Kylie Fischer
29-Apr-02	3			Female at nest	Kylie Fischer
09-May-02		3		Three 3-day old chicks	Kylie Fischer
14-May-02		1		Two chicks missing. Banded remaining chick, growth of 9 day old chick.	WH/KF
17-May-02			1	Chick popped from nest when putting back first time. Eventually stayed in nest. Male attacked Bill like he was a predator. Feeding 1 fledgling near nest area (Silver right leg, orange left leg)	WH/KF
23-May-02			1	Feeding 1 fledgling 500 m. south of the nest site	WH/KF
30-May-02			1	Family group just north of where they were seen last time. Fledgling foraging independently of adults but in their vicinity.	William Haas

Nest Number
W-05A-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel
Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Saw pair in large bowl (southern edge of study area). Unsure of behavior	Kylie Fischer
04-Apr-02				Birds heard in new area	William Haas
14-May-02				Heard calls while walking back from banding W-04A-02	WH/KF
23-May-02				Pair foraging	WH/KF
30-May-02				Female arranging nest material, 99% complete	William Haas

Third Quarterly Report for a Study of the Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands San Diego County, California

15 January 2003

Contract Number 44918

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Introduction

Campbell BioConsulting contracted Varanus Biological Services, Inc. (Varanus) to determine the number of pairs, monitor the nests of, band all young-of-the-year from, and conduct surveys for dispersing juvenile California Gnatcatchers (*Polioptila californica*) at two preserves located in Lakeside, San Diego County, California. The study area is within the Metro Lakeside-Jamul Segment of the County of San Diego's Multiple Species Conservation Plan (MSCP) Subarea Plan. It is located in the Lakeside Community Planning Area, San Diego County, California and consists of approximately 200 acres of publicly and privately owned land in portions of the El Cajon Rancho, Township 15 South, Range 1 East of the U.S. Geological Survey (USGS) 7.5' minute El Cajon, California map, San Bernardino Base and Meridian. Functionally, the study area is within the Metro Lakeside-Jamul Segment of the County of San Diego's MSCP Subarea Plan.

The specific properties constituting the site south of I-8 include portions of the Gatlin mitigation parcel (APN 401-191-03), and the Pembroke mitigation parcel (APN 401-010-03-02). The site to the north of I-8 consists of the California Department of Transportation (CalTrans) mitigation parcel (APN 400-070-05). The elevation of the study area ranges between about 700 and 1100 feet (about 210 to 335 meters). Soils are primarily Cieneba (CmrG), and Vista (VvG, VsE, VsG) (Bowman 1973).

The southern study site is generally hilly, sloping from south to north with steep, manufactured slopes descending to I-8. The northern study site is overall more gently sloped and is comprised of a relatively steep east-facing slope along its eastern boundary and a contoured central plateau composed of several shallow basins of various aspect. The islands of coastal sage scrub within the Lakeside archipelago are identified by the wildlife agencies and the County as containing "very high quality" habitat for California Gnatcatchers (M. Webb, Dept. of Parks and Recreation, pers. comm.). The study parcels presumably provide linkage to adjacent open space parcels located north and south of the study area, although to the south the habitat changes dramatically to dense chaparral and to the north the open space is located in a mosaic of parcels (the archipelago) separated by residential and industrial development.

Purpose

The study design is the product of the collaborative efforts of Dave Lawhead (California Department of Fish and Game, DFG) and Clark Winchell (U.S. Fish and Wildlife Service, FWS). The funding source is the DFG in support of the County. The study purpose is to address the question of whether California Gnatcatchers cross I-8 at this location. This is an important question to answer at the MSCP scale as the reserve design is based on the supposition that I-8 does not act in this area as a barrier to dispersal between North County and South County populations of the California Gnatcatcher.

Task Description

The California Gnatcatcher is a resident of the coastal plain in southern California. It's primary habitat is coastal sage scrub (CSS). Little is known about its regional population dynamics or dispersal patterns, or how capable it is of moving across large landscape barriers. Baseline data on the distribution, abundance, and habitat usage in these MSCP areas is lacking. This study will provide baseline data for the study area establishing current conditions and will facilitate future monitoring of this species in the area. Data on the dispersal patterns of juvenile California Gnatcatchers will be obtained by conducting an initial survey to determine the number of pairs in the study area , monitoring the nests of, banding all young-of-the-year from, and conducting follow-up surveys for dispersing juveniles.

The Study and Tasks

Objective

The primary goal of our study is to evaluate whether California Gnatcatchers move across I-8 thereby assessing whether this area can serve as a functional corridor as it is assumed to be in the MSCP Subarea Plan, or whether I-8 in this area acts as dispersal barrier. This one year study entails monitoring of color banded juvenile California Gnatcatchers to document their dispersal within the Gatlin and Pembroke mitigation areas (south of I-8) and the CalTrans mitigation site (north of I-8), and to determine whether there is movement between the two parcels. By marking a sample population and following the marked individuals over a one year period we hoped to determine whether dispersal occurs between suitable occupied habitats separated by the four-lane interstate highway.

Study Area

The study areas are located adjacent to I-8. Habitats at both study sites are variants of sage scrubs common along the southern California coast. The southern parcel is characterized by a variety of Diegan coastal sage scrubs that include several distinct pockets dominated either by Black Sage (*Salvia mellifera*), Laurel Sumac (*Malosma laurina*), or Chaparral Broom (*Baccharis sarothroides*). Their histories are related to previous patchy disturbance (mechanical or fire-related), and the overall time period since the area was last burned. Relatively greater vegetation density and diverse composition on the southern parcels are fostered by their northerly aspect and drainage from a greater area. The CalTrans parcel north of I-8 is more sparsely vegetated, primarily by sage scrubs dominated by California Sagebrush (*Artemisia californica*). This parcel exhibits a relatively greater percentage of disturbed habitat - of uncertain origin - than do the southern parcels. The disturbed areas are characterized by a mosaic of nonnative mustard-dominated

disturbed grasslands and sage scrubs and a network of dirt roads. The relatively lower density and less variable vegetative composition of this site is probably related to its disturbance history, smaller size, and extremely limited watershed compounded by a relatively large network of mechanically constructed disturbance corridors (i.e., footpaths and motorcycle trails) that foster invasive species colonization.

Methods

1 September - 31 December 2002

Varanus personnel regularly visited the study site between 1 September and 31 December 2002. Biologists Kylie Fischer and William Haas conducted surveys by walking meandering transects through each site to locate all California Gnatcatchers. Our primary goals were: 1) to locate fledglings and 2) to survey for our banded Gnatcatchers. We continued to document the locations of adult California Gnatcatchers when found.

Personnel

William E. Haas (TE-779910) and Kylie Fischer (TE-039321) conducted all surveys.

Results

1 September - 31 December

We routinely detected between three and six pairs of California Gnatcatchers during our site visits, up to four pairs in the two parcels on the south side of I-8 (range 1-4) and one or two pairs (range 1-2) in the parcel north of I-8. Note that the two study parcels south of I-8 adjoin currently suitable California Gnatcatcher habitats that were outside of our study area. On several occasions we observed up to three pairs of California Gnatcatchers foraging in adjacent habitats or move from our study area westward, into those adjacent habitats and out of our assigned study area. It is probable that four of the five pairs found within our study area moved between the study area and adjacent habitats; only the easternmost pair W-01-02 was routinely found within the study area, and even this pair was observed within 75 meters of the study area boundary on several occasions.

Evidence of Movement

On 13 September 2002 William Haas detected a banded juvenile (left leg purple; right leg silver USGS) on the Gatlin parcel. This bird was banded on the CalTrans site on 11 June 2002 in Territory C-01b-02. This was the second incident during our study by which we could ascertain movement of juvenile California Gnatcatchers between the northern and southern parcels.

Discussion

Banding

We conducted no banding activities between 1 September and 31 December.

Dispersal

Observations of dispersing juveniles on 23 July and 13 September is within the dispersal period documented in records from our previous studies (Hunsaker *et al.* 2000; K. Fischer field notes; W. Haas field notes) and suggests that juvenile dispersal surveys should be initiated soon after fledging occurs for a period of up to six months.

Threats

Both study areas suffer impacts related to the presence of homeless transients who occupy the study sites; some on an apparently long-term basis, others for brief periods. Some domiciles consist of a tent only placed in a small clearing, while longer term occupants clear vegetation under large shrubs and develop networks of trails that allow access from several directions. Transient use persists at both sites, where debris build-up also continues; we have found several fire rings, and occasionally found smoldering campfires. We continue to observed an escalating problem at the Gatlin/Pembroke parcels; trails one to two meters in width are being cut randomly through native vegetation, including through known California Gnatcatcher foraging areas. Other persistent causes of disturbance include (mountain) bicycle, all terrain vehicle, and motorcycle activity; as well as domesticated dogs and ponies being exercised “off-leash”.

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Hunsaker II, D., J. O'Leary and F. Awbrey. 2000. Final Report: Habitat Evaluation, Home Range Determination, and Dispersal Study of Coastal California Gnatcatcher (*Polioptila californica californica*) on Marine Corps Air Station Miramar. Prepared for Marine Corps Air Station Miramar and Southwest Division, Naval Facilities Engineering Command.

Appendix 1: Gnatcatcher Nesting Data, By Nest Number

Nest Number
C-01A-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Pair foraging	Kylie Fischer
09-Apr-02				Pair foraging throughout eastern half of parcel	Kylie Fischer
23-Apr-02				Pair foraging throughout eastern half of parcel	Kylie Fischer
29-Apr-02				Nest found, 25%, male building	Kylie Fischer
17-May-02				Nest abandoned	Kylie Fischer

Nest Number
C-01B-02

Species Baccharis sarothroides

Map Coordinates

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
17-May-02	2			Male incubating eggs, did not flush male	Kylie Fischer
30-May-02		2		Pair feeding chicks	William Haas
11-Jun-02			2	Nest almost gone - Banded two fledglings, at least one week old.	WH/KF

Nest Number
C-02A-02

Species

Map Coordinates

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Pair foraging	William Haas
09-Apr-02				Nest found, pair building	William Haas
23-Apr-02				Nest abandoned	William Haas

Nest Number
C-02B-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
29-Apr-02				No sign of pair	Kylie Fischer
17-May-02				Nest found, Pair building	William Haas
30-May-02				Female on nest. Unknown number of eggs	William Haas

Nest Number
C-02C-02

Species

Map Coordinates

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
15-Jul-02	1	1	1	Male seen with one fledgling	Kylie Fischer
23-Jul-02			1	Female foraging with old fledgling, banded fledgling	WH/KF

Gnatcatcher Nesting Data, By Nest Number

Nest Number W-01A-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
07-Mar-02				Hear California gnatcachers	WH/KF
22-Mar-02				No sign	Kylie Fischer
27-Mar-02				No sign	WH/KF
01-Apr-02				Pair foraging	WH/KF
04-Apr-02				Pair moves togeter in a limited area. Nest site searching?	William Haas
15-Apr-02				Nest found near observation point from previous visit, female incubating	William Haas
24-Apr-02	3			3 eggs	William Haas
29-Apr-02		3		3 chicks day 3-4	Kylie Fischer
02-May-02		3		Banded 3 chicks - day 6	Kylie Fischer
09-May-02				Nest in perfect condition but empty. Fate of chicks unknown.	Kylie Fischer

Nest Number W-01B-02

Species Salvia apiana

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
09-May-02				Pair building nest, taking material from old nest. Nest 90%	Kylie Fischer
17-May-02				Nest looks intact, but pair not in vicinity; calling far away	WH/KF
23-May-02				Nest abandoned, pair foraging in NE corner of parcel	WH/KF
30-May-02				Pair foraging	William Haas

Nest Number W-01C-02

Species

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
03-Jul-02	3	3	3	Pair found feeding three fledglings. Banded all three.	WH/KF

Nest Number W-02A-02

Species Baccharis sarothroides

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
01-Apr-02				Nest found, 50%, both adults building	William Haas
04-Apr-02				Pair still building, 90%	Kylie Fischer
15-Apr-02	2			Female on nest	Kylie Fischer
29-Apr-02				Nest depredated, no sign of pair	Kylie Fischer

Nest Number W-02B-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
09-May-02				Male calling constantly.	Kylie Fischer
17-May-02				Pair present, suspect new nest area	William Haas
23-May-02				Male scolding in area of *Baccharis sarothroides*. Pair foraging together	WH/KF
30-May-02				Pair building in Eriogonum in NW corner of parcel	William Haas

Nest Number W-03A-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
07-Mar-02				hear California Gnatcatchers	WH/KF
22-Mar-02				pair foraging	William Haas
01-Apr-02				pair foraging	William Haas
04-Apr-02				Pair present	WH/KF
15-Apr-02				Nest found near trail approximately half way up the slope.	William Haas
29-Apr-02				Nest abandoned or depredated, calls heard downslope	Kylie Fischer
09-May-02				Unsure of location or if neighboring pair	Kylie Fischer
17-May-02				a few calls	William Haas
23-May-02				pair foraging	William Haas
30-May-02				Pair quiet and staying low in vegetation	William Haas

Nest Number W-04A-02

Species Artemisia californica

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
01-Apr-02				possible pair	William Haas
04-Apr-02				pair foraging	Kylie Fischer
15-Apr-02				Pair building nest, 90% complete	Kylie Fischer
29-Apr-02	3			Female at nest	Kylie Fischer
09-May-02		3		Three 3-day old chicks	Kylie Fischer
14-May-02		1		Two chicks missing. Banded remaining chick, growth of 9 day old chick.	WH/KF
				Chick popped from nest when putting back first time. Eventually stayed in nest. Male attacked Bill like he was a predator.	
17-May-02			1	Feeding 1 fledgling near nest area (Silver right leg, orange left leg)	WH/KF
23-May-02			1	Feeding 1 fledgling far from nest site	WH/KF
30-May-02			1	Family group just north of where they were seen last time. Fledgling foraging independently of adults but in their vicinity.	William Haas

Gnatcatcher Nesting Data, By Nest Number

Nest Number
W-05A-02

Parcel	**Species**	**Map Coordinates**
Walmart	Eriogonum fasciculatum	

	Number of:				
Date	**Eggs**	**Chicks**	**Fledges**	**Comments**	**Observer**
27-Mar-02				Saw pair in large bowl. Unsure of behavior	Kylie Fischer
04-Apr-02				Birds heard in new area	William Haas
14-May-02				Heard calls while walking back from banding W-04A-02	WH/KF
23-May-02				Pair foraging	WH/KF
30-May-02				Female fixing nest, 99% complete	William Haas

Second Quarterly Report for a Study of the Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands San Diego County, California

15 September 2002

Contract Number 44918

Prepared for:
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Introduction

Campbell BioConsulting contracted Varanus Biological Services, Inc. (Varanus) to determine the number of pairs, monitor the nests of, band all young-of-the-year from, and conduct surveys for dispersing juvenile California Gnatcatchers (*Polioptila californica*) at two preserves located in Lakeside, San Diego County, California. The study area is within the Metro Lakeside-Jamul Segment of the County of San Diego's Multiple Species Conservation Plan (MSCP) Subarea Plan. It is located in the Lakeside Community Planning Area, San Diego County, California and consists of approximately 200 acres of publicly and privately owned land in portions of the El Cajon Rancho, Township 15 South, Range 1 East of the U.S. Geological Survey (USGS) 7.5' minute El Cajon, California map, San Bernardino Base and Meridian. Functionally, the study area is within the Metro Lakeside-Jamul Segment of the County of San Diego's MSCP Subarea Plan.

The specific properties constituting the site south of I-8 include portions of the Gatlin mitigation parcel (APN 401-191-03), and the Pembroke mitigation parcel (APN 401-010-03-02). The site to the north of I-8 consists of the California Department of Transportation (CalTrans) mitigation parcel (APN 400-070-05). The elevation of the study area ranges between about 700 and 1100 feet (about 210 to 335 meters). Soils are primarily Cieneba (CmrG), and Vista (VvG, VsE, VsG) (Bowman 1973).

The southern study site is generally hilly, sloping from south to north with steep, manufactured slopes descending to I-8. The northern study site is overall more gently sloped and is comprised of a relatively steep east-facing slope along its eastern boundary and a contoured central plateau composed of several shallow basins of various aspect. The islands of coastal sage scrub within the Lakeside archipelago are identified by the wildlife agencies and the County as containing "very high quality" habitat for California Gnatcatchers (M. Webb, Dept. of Parks and Recreation, pers. comm.). The study parcels presumably provide linkage to adjacent open space parcels located north and south of the study area, although to the south the habitat changes dramatically to dense chaparral and to the north the open space is located in a mosaic of parcels (the archipelago) separated by residential and industrial development.

Purpose

The study design is the product of the collaborative efforts of Dave Lawhead (California Department of Fish and Game, DFG) and Clark Winchell (U.S. Fish and Wildlife Service, FWS). The funding source is the DFG in support of the County. The study purpose is to address the question of whether California Gnatcatchers cross I-8 at this location. This is an important question to answer at the MSCP scale as the reserve design is based on the supposition that I-8 does not act in this area as a barrier to dispersal between North County and South County populations of the California Gnatcatcher.

Task Description

The California Gnatcatcher is a resident of the coastal plain in southern California. It's primary habitat is coastal sage scrub (CSS). Little is known about its regional population dynamics or dispersal patterns, or how capable it is of moving across large landscape barriers. Baseline data on the distribution, abundance, and habitat usage in these MSCP areas is lacking. This study will provide baseline data for the study area establishing current conditions and will facilitate future monitoring of this species in the area. Data on the dispersal patterns of juvenile California Gnatcatchers will be obtained by conducting an initial survey to determine the number of pairs in the study area , monitoring the nests of, banding all young-of-the-year from, and conducting follow-up surveys for dispersing juveniles.

The Study and Tasks

Objective

The primary goal of our study is to evaluate whether California Gnatcatchers move across I-8 thereby assessing whether this area can serve as a functional corridor as it is assumed to be in the MSCP Subarea Plan, or whether I-8 in this area acts as dispersal barrier. This one year study entails monitoring of color banded juvenile California Gnatcatchers to document their dispersal within the Gatlin and Pembroke mitigation areas (south of I-8) and the CalTrans mitigation site (north of I-8), and to determine whether there is movement between the two parcels. By marking a sample population and following the marked individuals over a one year period we hoped to determine whether dispersal occurs between suitable occupied habitats separated by the four-lane interstate highway.

Study Area

The study areas are located adjacent to I-8. Habitats at both study sites are variants of sage scrubs common along the southern California coast. The southern parcel is characterized by a variety of Diegan coastal sage scrubs that include several distinct pockets dominated either by Black Sage (*Salvia mellifera*), Laurel Sumac (*Malosma laurina*), or Chaparral Broom (*Baccharis sarothroides*). Their histories are related to previous patchy disturbance (mechanical or fire-related), and the overall time period since the area was last burned. Relatively greater vegetation density and diverse composition on the southern parcels are fostered by their northerly aspect and drainage from a greater area. The CalTrans parcel north of I-8 is more sparsely vegetated, primarily by sage scrubs dominated by California Sagebrush (*Artemisia californica*).

This parcel exhibits a relatively greater percentage of disturbed habitat - of uncertain origin - than do the southern parcels. The disturbed areas are characterized by a mosaic of nonnative mustard-dominated disturbed grasslands and sage scrubs and a network of dirt roads. The relatively lower density and less variable vegetative composition of this site is probably related to its disturbance history, smaller size, and extremely limited watershed compounded by a relatively large network of mechanically constructed disturbance corridors (i.e., footpaths and motorcycle trails) that foster invasive species colonization.

Methods

June 1st – August 31st 2002

Varanus personnel regularly visited the study site between 1 June and 31 August 2002. Biologists Kylie Fischer and William Haas conducted surveys by walking meandering transects through each site to locate all California Gnatcatchers. Through mid-July our goals were several, but especially: 1) to locate active nests, 2) to locate fledglings soon after they left the nest, 3) to band all unbanded young-of-the-year that we detected, and 4) to survey for our banded Gnatcatchers.

Banding Methods

Prior to 1 June, we banded only locals (nestlings). Based on our assessment of potentially adverse impacts to nest success due to the extremely dry vegetation we decided that for the remainder of 2002 we would mist net to capture and band fledglings, and avoid all contact with active nests. We captured juvenile Gnatcatchers by locating family groups within the natal territory. Family groups are typically easy to locate because they are typically very noisy, as adults and juveniles maintain contact while they move through and forage within their territories. We captured juveniles for banding, usually within two weeks of fledging, by placing mist nets along movement corridors that we documented while monitoring. After capture, we placed one numbered U.S. Geological Survey (USGS) aluminum band on one leg, and one to two re-sized (Haas and Fischer 1999) celluloid color bands on the other leg. We documented locations of pairs and family groups during each site visit, however during each site visit we focused especially on locating color-marked birds. Once found, we mapped the location using a Global Positioning System (GPS) handheld recorder with ±2.5 meters.

Personnel

William E. Haas (TE-779910), Kylie Fischer (TE-039321) and Ingri Quon (TE-812740) conducted

all surveys, nest searches, and nest monitoring. William Haas banded all juvenile California Gnatcatchers; he was assisted by Kylie Fischer and Ingri Quon.

Results

1 June - 31 August

We routinely detected between three and seven pairs of California Gnatcatchers during our site visits, five pairs in the two parcels on the south side of I-8 (range 2-5) and two pairs (range 1-3) in the parcel north of I-8. Note that the two study parcels south of I-8 adjoin currently suitable California Gnatcatcher habitats that were outside of our study area. On several occasions we observed up to three pairs of California Gnatcatchers foraging in adjacent habitats or move from our study area westward, into those adjacent habitats and out of our assigned study area. It is probable that four of the five pairs found within our study area moved between the study area and adjacent habitats; only the easternmost pair W-01-02 was routinely found within the study area, and even this pair was observed within 75 meters of the study area boundary on several occasions.

Between 1 June and 31 August we banded six fledglings (Table 1) contributing to a total of seven for the 2002 breeding season.

Table 1: Banding combinations used from 1 June to 31 August

Nest Name	Date Banded	Left Leg	Right Leg
C-01b-02	11 June 2002	white	Silver USGS
C-01b-02	11 June 2002	purple	Silver USGS
W-01c-02	3 July 2002	purple/purple	Silver USGS
W-01c-02	3 July 2002	dark blue/orange	Silver USGS
W-01c-02	3 July 2002	orange/orange	Silver USGS
C-02c-02	23 July 2002	yellow/blue	Blue USGS

Evidence of Movement

On 23 July 2002 Kylie Fischer documented the occurrence in the WalMart parcel of a juvenile that had been banded in on 11 June 2001 in Territory C-01B-02, that is, north of I-8 in the CalTrans parcel.

Discussion

Banding

Conditions throughout southern California during 2002 have been extremely dry. The period between September 2001 and August 2002 was the driest in San Diego recorded history dating back to the period 1 July 1850 to 30 June 1851 (Brad Doyle, U.S. Weather Bureau, 13 September 2002 pers. com.). Because of the dry conditions, much of the vegetation in our study sites had become senescent resulting in suspension of vegetative growth and defoliation of a large percentage of its leafy canopy resulting in the reduction of protective and cryptic cover. We believe that under those conditions, human scent left in the vicinity of a nest is easier for a predator to trace. With little cover to provide camouflage or protection we were remiss to approach and thus band chicks at the nest. We decided to band fledglings within two weeks of their leaving the nest, having altered our methods to avoid endangering active nests.

Dispersal

During July and August we observed an influx of California Gnatcatchers into the CalTrans parcel. In addition to pairs C-01-02 (with their two juveniles) and C-02-02 (with one juvenile) we documented the occurrence at the CalTrans parcel of one additional adult pair (based on plumage and behaviors) as well as one pair of juveniles (based on plumage). The history of their occurrence is unknown; none of these individuals was marked in such a way that we could establish their identities. On 15 July, the C-01b-02 fledgling banded left leg white, right leg silver (USGS) was seen between territories C-01-02 and C-02-02 on the Caltrans parcel. On 23 July, the same individual was observed foraging south of W-05-02 and north of W-01-02 on the WalMart parcel. Thus, between 15 and 23 July one of our banded juveniles crossed I-8, from north to south. Timing of this migration is within the dispersal period documented in records from our previous studies (K. Fischer field notes; W. Haas field notes) and suggests that juvenile dispersal surveys need to be conducted soon after fledging occurs, and into the six months following the end of the breeding season.

Threats

Both study areas suffer impacts related to the presence of homeless transients who occupy the study sites; some on an apparently long-term basis, others for brief periods. Some domiciles consist of a tent only placed in a small clearing, while longer term occupants clear vegetation under large shrubs and develop networks of trails that allow access from several directions. The level of occupation at the WalMart site

declined after the discovery by San Diego County Sheriffs of two bodies in early July. Transient use persists at both sites, where debris build-up also continues. We have observed a more recent, escalating problem at the Gatlin/Pembroke parcels; trails one to two meters in width are being cut randomly through native vegetation, including through known California Gnatcatcher foraging areas. Other persistent causes of disturbance include (mountain) bicycle, all terrain vehicle, and motorcycle activity; as well as domesticated dogs and ponies being exercised "off-leash".

References

Bowman, R.H. 1973. Soil survey of San Diego Area, California. USDA. Soil Conserv. Serv., Washington, DC.

Haas, W. and K. Fischer. 1999. An improved of method of preparing small color bands. N. Amer. Bird Bander. 24(2):42-43.

Appendix 1: Gnatcatcher Nesting Data, By Nest Number

Nest Number
C-01A-02

Species | **Map Coordinates**

Parcel
Caltrans

Eriogonum fasciculatum

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Pair foraging	Kylie Fischer
09-Apr-02				Pair foraging throughout eastern half of parcel	Kylie Fischer
23-Apr-02				Pair foraging throughout eastern half of parcel	Kylie Fischer
29-Apr-02				Nest found, 25%, male building	Kylie Fischer
17-May-02				Nest abandoned	Kylie Fischer

Nest Number
C-01B-02

Species | **Map Coordinates**

Parcel
Caltrans

Baccharis sarothroides

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
17-May-02	2			Male incubating eggs, did not flush male	Kylie Fischer
30-May-02		2		Pair feeding chicks	William Haas
11-Jun-02			2	Nest almost gone - Banded two fledglings, at least one week old.	WH/KF

Nest Number
C-02A-02

Species | **Map Coordinates**

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Pair foraging	William Haas
09-Apr-02				Nest found, pair building	William Haas
23-Apr-02				Nest abandoned	William Haas

Nest Number
C-02B-02

Species | **Map Coordinates**

Parcel
Caltrans

Eriogonum fasciculatum

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
29-Apr-02				No sign of pair	Kylie Fischer
17-May-02				Nest found, Pair building	William Haas
30-May-02				Female on nest. Unknown number of eggs	William Haas

Nest Number
C-02C-02

Species | **Map Coordinates**

Parcel
Caltrans

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
15-Jul-02	1	1	1	Male seen with one fledgling	Kylie Fischer
23-Jul-02			1	Female foraging with old fledgling, banded fledgling	WH/KF

Nest Number W-01A-02

Species	Map Coordinates
Eriogonum fasciculatum	

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
07-Mar-02				Hear California gnatcachers	WH/KF
22-Mar-02				No sign	Kylie Fischer
27-Mar-02				No sign	WH/KF
01-Apr-02				Pair foraging	WH/KF
04-Apr-02				Pair moves togeter in a limited area. Nest site searching?	William Haas
15-Apr-02				Nest found near observation point from previous visit, female incubating	William Haas
24-Apr-02	3			3 eggs	William Haas
29-Apr-02		3		3 chicks day 3-4	Kylie Fischer
02-May-02		3		Banded 3 chicks - day 6	Kylie Fischer
09-May-02				Nest in perfect condition but empty. Fate of chicks unknown.	Kylie Fischer

Nest Number W-01B-02

Species	Map Coordinates
Salvia apiana	

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
09-May-02				Pair building nest, taking material from old nest. Nest 90%	Kylie Fischer
17-May-02				Nest looks intact, but pair not in vicinity; calling far away	WH/KF
23-May-02				Nest abandoned, pair foraging in NE corner of parcel	WH/KF
30-May-02				Pair foraging	William Haas

Nest Number W-01C-02

Species	Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
03-Jul-02	3	3	3	Pair found feeding three fledglings. Banded all three.	WH/KF

Nest Number W-02A-02

Species	Map Coordinates
Baccharis sarothroides	

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
01-Apr-02				Nest found, 50%, both adults building	William Haas
04-Apr-02				Pair still building, 90%	Kylie Fischer
15-Apr-02	2			Female on nest	Kylie Fischer
29-Apr-02				Nest depredated, no sign of pair	Kylie Fischer

Nest Number W-02B-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
09-May-02				Male calling constantly.	Kylie Fischer
17-May-02				Pair present, suspect new nest area	William Haas
23-May-02				Male scolding in area of *Baccharis sarothroides*. Pair foraging together	WH/KF
30-May-02				Pair building in Eriogonum in NW corner of parcel	William Haas

Nest Number W-03A-02

Species Eriogonum fasciculatum

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
07-Mar-02				hear California Gnatcatchers	WH/KF
22-Mar-02				pair foraging	William Haas
01-Apr-02				pair foraging	William Haas
04-Apr-02				Pair present	WH/KF
15-Apr-02				Nest found near trail approximately half way up the slope.	William Haas
29-Apr-02				Nest abandoned or depredated, calls heard downslope	Kylie Fischer
09-May-02				Unsure of location or if neighboring pair	Kylie Fischer
17-May-02				a few calls	William Haas
23-May-02				pair foraging	William Haas
30-May-02				Pair quiet and staying low in vegetation	William Haas

Nest Number W-04A-02

Species Artemisia californica

Map Coordinates

Parcel Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
01-Apr-02				possible pair	William Haas
04-Apr-02				pair foraging	Kylie Fischer
15-Apr-02				Pair building nest, 90% complete	Kylie Fischer
29-Apr-02	3			Female at nest	Kylie Fischer
09-May-02		3		Three 3-day old chicks	Kylie Fischer
14-May-02		1		Two chicks missing. Banded remaining chick, growth of 9 day old chick.	WH/KF
				Chick popped from nest when putting back first time. Eventually stayed in nest. Male attacked Bill like he was a predator.	
17-May-02			1	Feeding 1 fledgling near nest area (Silver right leg, orange left leg)	WH/KF
23-May-02			1	Feeding 1 fledgling far from nest site	WH/KF
30-May-02			1	Family group just north of where they were seen last time. Fledgling foraging independently of adults but in their vicinity.	William Haas

Gnatcatcher Nesting Data, By Nest Number

Nest Number
W-05A-02

Species | **Map Coordinates**

Parcel
Eriogonum fasciculatum
Walmart

Date	Number of: Eggs	Chicks	Fledges	Comments	Observer
27-Mar-02				Saw pair in large bowl. Unsure of behavior	Kylie Fischer
04-Apr-02				Birds heard in new area	William Haas
14-May-02				Heard calls while walking back from banding W-04A-02	WH/KF
23-May-02				Pair foraging	WH/KF
30-May-02				Female fixing nest, 99% complete	William Haas

Fourth Quarterly Report for a Study of the Coastal California Gnatcatcher Juvenile Dispersal across Interstate-8 at the MSCP Southern Lakeside Archipelago Lands San Diego County, California

1 April 2003

Contract Number 44918

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Contact: William Haas

Introduction

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The specific properties constituting the site south of I-8 include portions of the Gatlin mitigation parcel (APN 401-191-03), and the Pembroke mitigation parcel (APN 401-010-03-02). The site to the north of I-8 consists of the California Department of Transportation (CalTrans) mitigation parcel (APN 400-070-05). The elevation of the study area ranges between about 700 and 1100 feet (about 210 to 335 meters). Soils are primarily Cieneba (CmrG), and Vista (VvG, VsE, VsG) (Bowman 1973).

The southern study site is generally hilly, sloping from south to north with steep, manufactured slopes descending to I-8. The northern study site is overall more gently sloped and is comprised of a relatively steep east-facing slope along its eastern boundary and a contoured central plateau composed of several shallow basins of various aspect. The islands of coastal sage scrub within the Lakeside archipelago are identified by the wildlife agencies and the County as containing "very high quality" habitat for California Gnatcatchers (M. Webb, Dept. of Parks and Recreation, pers. comm.). The study parcels presumably provide linkage to adjacent open space parcels located north and south of the study area, although to the south the habitat changes dramatically to dense chaparral and to the north the open space is located in a mosaic of parcels (the archipelago) separated by residential and industrial development.

Purpose

The study design is the product of the collaborative efforts of Dave Lawhead (California Department of Fish and Game, DFG) and Clark Winchell (U.S. Fish and Wildlife Service, FWS). The funding source is the DFG in support of the County. The study purpose is to address the question of whether California Gnatcatchers cross I-8 at this location. This is an important question to answer at the MSCP scale as the reserve design is based on the supposition that I-8 does not act in this area as a barrier to dispersal between North County and South County populations of the California Gnatcatcher.

Task Description

The California Gnatcatcher is a resident of the coastal plain in southern California. It's primary habitat is coastal sage scrub (CSS). Little is known about its regional population dynamics or dispersal patterns, or how capable it is of moving across large landscape barriers. Baseline data on the distribution, abundance, and habitat usage in these MSCP areas is lacking. This study will provide baseline data for the study area establishing current conditions and will facilitate future monitoring of this species in the area. Data on the dispersal patterns of juvenile California Gnatcatchers will be obtained by conducting an initial survey to determine the number of pairs in the study area , monitoring the nests of, banding all young-of-the-year from, and conducting follow-up surveys for dispersing juveniles.

The Study and Tasks

Objective

The primary goal of our study is to evaluate whether California Gnatcatchers move across I-8 thereby assessing whether this area can serve as a functional corridor as it is assumed to be in the MSCP Subarea Plan, or whether I-8 in this area acts as dispersal barrier. This one year study entails monitoring of color banded juvenile California Gnatcatchers to document their dispersal within the Gatlin and Pembroke mitigation areas (south of I-8) and the CalTrans mitigation site (north of I-8), and to determine whether there is movement between the two parcels. By marking a sample population and following the marked individuals over a one year period we hoped to determine whether dispersal occurs between suitable occupied habitats separated by the four-lane interstate highway.

Study Area

The study areas are located adjacent to I-8. Habitats at both study sites are variants of sage scrubs common along the southern California coast. The southern parcel is characterized by a variety of Diegan coastal sage scrubs that include several distinct pockets dominated either by Black Sage (*Salvia mellifera*), Laurel Sumac (*Malosma laurina*), or Chaparral Broom (*Baccharis sarothroides*). Their histories are related to previous patchy disturbance (mechanical or fire-related), and the overall time period since the area was last burned. Relatively greater vegetation density and diverse composition on the southern parcels are fostered by both the northerly aspect and drainage from a greater area. The CalTrans parcel north of I-8 is more sparsely vegetated, primarily by sage scrubs dominated by California Sagebrush (*Artemisia californica*). This parcel exhibits a relatively greater percentage of disturbed habitat - of uncertain origin - than do the southern parcels. The disturbed areas are characterized by a mosaic of nonnative mustard-dominated disturbed grasslands and sage scrubs and a network of dirt roads. The relatively lower density

and less variable vegetative composition of this site is probably related to its disturbance history, smaller size, and extremely limited watershed compounded by a relatively large network of mechanically constructed disturbance corridors (i.e., footpaths and motorcycle trails) that foster invasive species colonization.

Methods

January 01st – March 15th 2003

Varanus personnel regularly visited the study site between 01 January and 15 March 2003. Biologists Kylie Fischer and William Haas conducted surveys by walking meandering transects through each site to locate all California gnatcatchers. We documented locations of gnatcatchers during each site visit, especially focusing on color-marked birds.

Personnel

William E. Haas (TE-779910), Kylie Fischer (TE-039321) and Thomas Myers conducted all surveys. Mr. Myers accompanied Ms. Fischer as a field escort for safety reasons, to augment species lists, and to quantify impacts from illegal trail cutting. No banding was conducted during this quarter.

Results

1 January - 15 March

Between 1 January and 15 March we routinely detected between three and six pairs of California Gnatcatchers during our site visits, up to four pairs in the two parcels on the south side of I-8 (range 1-4) and one or two pairs (range 1-2) in the parcel north of I-8. Note that the two study parcels south of I-8 adjoin currently suitable California Gnatcatcher habitats that were outside of our study area. On several occasions we observed up to three pairs of California Gnatcatchers foraging in adjacent habitats or move from our study area westward, into those adjacent habitats and out of our assigned study area. It is probable that four of the five pairs found within our study area moved between the study area and adjacent habitats; only the easternmost pair W-01-02 was routinely found within the study area, and even this pair was observed within 75 meters of the study area boundary on several occasions.

Evidence of Movement

Between 1 January and 15 March 2003 we detected no dispersal of juvenile California Gnatcatchers between our study areas. Neither did we re-find either of the two juveniles that we had documented as having dispersed from the northern study parcel to the southern study parcels across I-8.

Discussion

Banding

We conducted no banding activities between 1 September and 31 December.

Dispersal

California Gnatcatcher detectability is typically lowest in early winter; this is still technically during the non-breeding season when the pairs forage quietly most of the time and juveniles may also be extremely quiet. We saw no evidence of dispersal beyond our earlier reported incidents, that is, of two juveniles, observed on 23 July and 13 September respectively. This may be attributed to a number of reasons, the foremost being: 1) the low level of calling activity in general at this time of year, 2) the small sample size (n=7) from which we could derive our data, and 3) the possibility of reduced number of juvenile California Gnatcatchers due to mortality. Our study did not investigate any of these possible causes.

Threats

Both study areas suffer impacts related to the presence of homeless transients who occupy the study sites; some on an apparently long-term basis, others for brief periods. Some domiciles consist of a tent only placed in a small clearing, while longer term occupants clear vegetation under large shrubs and develop networks of trails that allow access from several directions. Transient use persists at both sites, where debris build-up also continues; we have found several fire rings, and occasionally found smoldering campfires. We continue to observed an escalating problem at the Gatlin/Pembroke parcels; trails one to two meters in width are being cut randomly through native vegetation, including through known California Gnatcatcher foraging areas. Other persistent causes of disturbance include (mountain) bicycle, all terrain vehicle, and motorcycle activity; as well as domesticated dogs and ponies being exercised “off-leash”.

References

Bowman, R.H. 1973. Soil survey of San Diego Area, California. USDA. Soil Conserv. Serv., Washington, D.C.