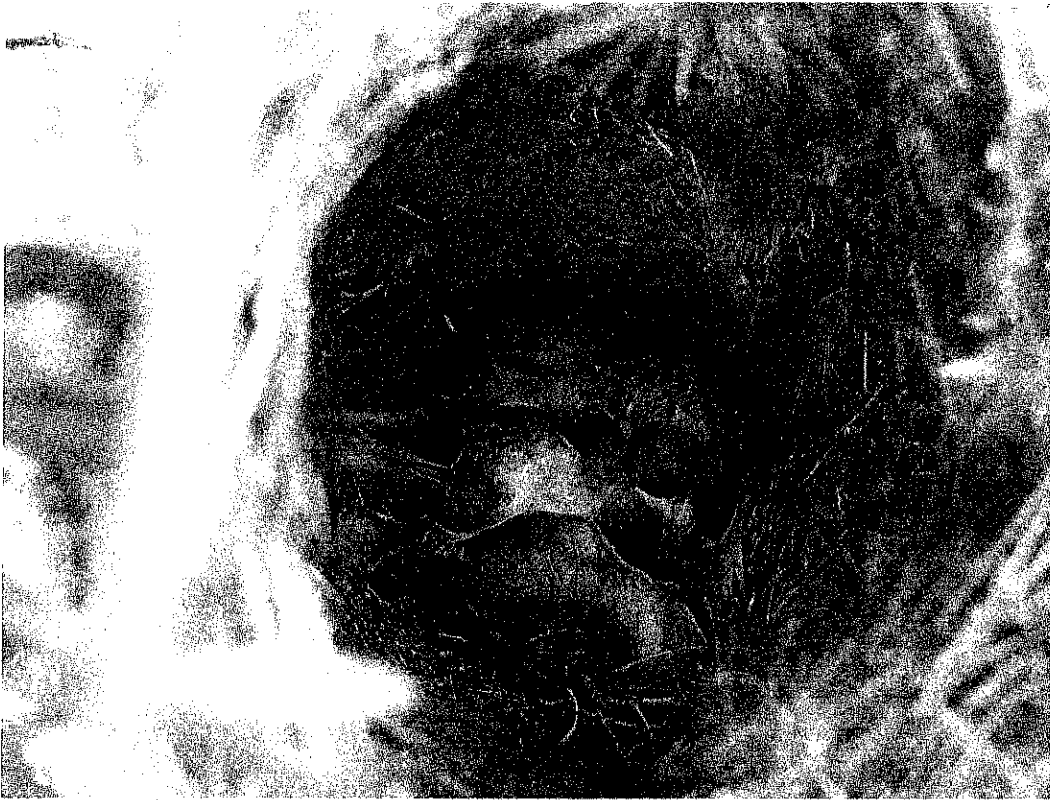


# **2008 SAN DIEGUITO RIVER PARK**

## **AVIAN SURVEY**



California gnatcatcher chicks 2-3 days after hatching.



**GRIFFITH WILDLIFE BIOLOGY**

# **2008 SAN DIEGUITO RIVER PARK AVIAN SURVEY**

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## EXECUTIVE SUMMARY

An avian survey to determine the point location, breeding status, and band status of all individuals and pairs of the California gnatcatcher (*Polioptila californica californica*) was performed at the Bernardo Mountain Preserve, San Dieguito River Park in San Diego County, California. Three replicate surveys (4 days per survey pass) were performed between 22 March and 12 May 2008. A cumulative list of incidentally observed birds was compiled, with special emphasis upon the coastal cactus wren (*Campylorhynchus brunneicapillus couesi*) and least Bell's vireo (*Vireo bellii pusillus*).

Thirteen gnatcatcher (11 pairs, 2 single males), five cactus wren (all pairs), and no vireo breeding territories were detected. The gnatcatchers produced 26 (minimum) to 40 (maximum) fledglings. Sixty-four avian species were incidentally observed within the immediate study area. The brood parasitic brown-headed cowbird (*Molothrus ater*) was detected in the study area; no parasitism events were observed.

The gnatcatchers and wrens were restricted to habitat that was not burned in the October 2007 Witch Fire, primarily upslope and downslope of the perimeter road/trail. There is little to no additional suitable vacant habitat available in the study area.

Key words: Bernardo Mountain Preserve, brown-headed cowbird (*Molothrus ater*), California, California gnatcatcher (*Polioptila californica californica*), coastal cactus wren (*Campylorhynchus brunneicapillus couesi*), least Bell's vireo (*Vireo bellii pusillus*), San Diego County, Witch Fire.

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## INTRODUCTION

### California gnatcatcher

The California gnatcatcher (*Polioptila californica*) is a small gray and black songbird that inhabits scrub plant communities from coastal southern California to the tip of the Baja California Peninsula. Three subspecies are recognized. The northernmost nominate race, the coastal California gnatcatcher (*Polioptila californica californica*), is a resident of coastal sage scrub and adjacent ecotonal habitats from southern Ventura County southward to northwestern Baja California, Mexico near El Rosario at approximately 30 degrees North latitude, generally found below 500 m (Atwood and Bontrager 2001). The species was originally described as distinct in 1881 but was subsequently lumped with the black-tailed gnatcatcher (*Polioptila melanura*) until Atwood (1988) concluded that it was specifically distinct based on differences in ecology, behavior, and distribution, a finding later adopted by the American Ornithologist's Union (AOU 1989). The subspecies was listed as threatened by the U.S. Fish and Wildlife Service (USFWS) in March 1993 due to habitat loss and fragmentation occurring in conjunction with urban and agricultural development and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (58 FR 16742). Loss of historic habitat is estimated to be 70-90% (Michael Brandman Associates 1991, USFWS 1997). Critical habitat comprised of 13 units encompassing 207,890 ha (12% Federal, 5% local and State, 83% private) was designated by the USFWS in 2000 (Krofta 2000). The life history, management, and research priorities for the California gnatcatcher are presented in Atwood and Bontrager (2001).

The coastal California gnatcatcher occurs almost exclusively in coastal sage scrub (CSS) (Woods 1928, Atwood and Bontrager 2001), although they are sometimes found in adjacent chaparral, riparian, grassland, or disturbed habitats with which CSS is ecotonal (USFWS 1997, Campbell et al. 1998). Coastal sage scrub is a distinctive vegetation type with several subassociations including Venturan, Riversidian, and Diegan in Southern California (Atwood 1993), the southern limit of which coincides with the southern limit of the range of *P. c. californica* and several other birds, plants, terrestrial insects, land mammals, reptiles, and scorpions at about 30 degrees north latitude in Baja California (Atwood 1991). Coastal sage scrub is composed of relatively small (<2m) mostly summer-deciduous shrubs and succulent plants, including California sagebrush (*Artemisia californica*), various species of sage (*Salvia spp*), flat-topped buckwheat (*Eriogonum fasciculatum*), sunflower (*Encelia californica*), prickly pear and cholla cactus (*Opuntia spp*) and various species of goldenbush (*Haplopappus spp*), often interspersed with larger shrubs such as Mexican elderberry (*Sambucus mexicana*), toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*) and lemonade berry (*Rhus integrifolia*) (O'Leary 1990, Holland 1986). The plant composition of gnatcatcher territories may vary widely, but California sagebrush is the dominant or co-dominant shrub in 85% or more territories (Griffith and Griffith 1997, Atwood and Bontrager 2001). CSS dominated by black sage (*Salvia mellifera*), white sage (*Salvia apiana*), and lemonadeberry (*Rhus integrifolia*) supports few or no gnatcatchers, especially in coastal areas (Atwood and Bontrager 2001).

Gnatcatcher use of adjacent and mixed habitats (chaparral, grassland, riparian, and disturbed) is well-documented, and may be critical for dispersal, foraging, and shelter, especially during drought or inclement weather (USFWS 1997, Griffith and Griffith 1997).

Coastal sage scrub habitat has been in noted decline since the 1940's and is now considered the most endangered habitat type in the continental United States due to past and planned urbanization and agricultural activities (Grinnell and Miller 1944, Westman 1981 and 1987, Michael Brandman Associates 1991). Only about 20% of the remaining coastal sage scrub habitat in southern California occurs on public lands, of which more than 60% (approximately 52,500 acres) is on military reservations, according to the California Department of Fish and Game (CDFG 1993).

The breeding season of the California gnatcatcher extends from about 15 February, when the breeding plumage black cap of the male becomes apparent, through 30 August (Atwood and Bontrager 2001). Annual changes in the timing of breeding plumage and first nests may be related to precipitation and temperature (Grishaver et al 1998, Atwood and Bontrager 2001). The peak of nesting activity is mid-March to mid-May at Marine Corps Base Camp Pendleton (Base, Camp Pendleton) (Griffith and Griffith 1997) and elsewhere in San Diego and Orange Counties (Atwood and Bontrager 2001). Prior to nesting, pairs are vocal and relatively easy to detect. After nesting has begun, pairs are less vocal, more secretive, and more difficult to detect. Both adults participate in nest building. Incubation of 3-5 eggs requires 14 days. The young fledge at 12-16 days of age and are capable of independence within 3-4 weeks, although they may remain associated with the family group for several months. Post-fledging family groups are vocal, visible, and relatively easy to detect. By mid to late summer, unmarked hatch-year gnatcatchers are not reliably distinguishable by sight or voice from post hatch-year adults in the field. Hatch-year gnatcatchers may form pair bonds and defend territories by October, some as early as July (Atwood and Bontrager 2001).

Gnatcatchers are extremely fecund. Pairs may attempt 10 nests and raise 3 broods during a single breeding season (Atwood and Bontrager 2001). At Camp Pendleton in 1993-1994, about 70% of nests were successful, producing 3.5 young per nest; 84-98% of pairs were successful (produced at least 1 fledgling); and 13-17% of pairs attempted double-brooding (Griffith and Griffith 1997). Other sites report nest success rates of 32-74%, 1.6 to 4.4 young per pair, and double-brooding rates of 15-52% (Atwood and Bontrager 2001). Gnatcatchers are known to have higher success rates, more young per nest, and increased survivorship in larger, higher quality habitat adjacent to riparian habitat, as opposed to small, poor-quality, isolated patches (Atwood et al 1998, Famolaro and Newman 1998). Some sites may have higher than average productivity due to large amounts of high quality habitat with contiguous riparian refugia.

Cowbird brood parasitism impacts gnatcatcher productivity, especially in areas with near cowbird foraging areas (dairies) and near host-rich and cowbird-preferred riparian habitat (Braden 1992, Bontrager et al 1995, Griffith and Griffith 2000). Only 2% of gnatcatcher eggs

hatch after a parasitism event; no gnatcatcher fledglings are known from parasitized nests (Braden et al 1997). Gnatcatchers may be scarce or absent from some areas containing suitable habitat due to persistent and prolonged cowbird parasitism (Atwood 1993), but since the peak of gnatcatcher nesting occurs before the major dispersal of cowbirds from wintering flocks to breeding habitat, and because cowbirds prefer host-rich riparian habitat, cowbird parasitism does not appear to be driving the species to extinction (Braden et al 1997, Griffith and Griffith 1993). In Riverside County, Braden et al (1997) and Griffith and Griffith (1993) reported parasitism rates increasing from zero to 47% (n=107) and 71% (n=7), respectively, before and after cowbird dispersal into coastal sage scrub habitat in April and May.

California gnatcatchers have also benefited from cowbird control done on behalf of the federally endangered least Bell's vireo (*Vireo bellii pusillus*) (USFWS 1998, Griffith and Griffith 2000). In Orange County, California, gnatcatcher nest parasitism rates of 59% (n=17) prior to cowbird trapping were reduced to less than 1% (n>200) after trapping was initiated (Miner et al 1998). Atwood (1990) recorded a 20% parasitism rate (n=5) among the gnatcatcher at Camp Pendleton in 1980. Cowbird control has been performed annually at Camp Pendleton since 1983 (40 traps Base-wide since 1988) (Griffith Wildlife Biology 2005). No parasitism of the California gnatcatcher has been observed on Base since 1980 (n>172; Tutton 1991, Griffith and Griffith 1997, Atwood et al 1998).

Gnatcatchers suffer winter mortality associated with prolonged periods of rainfall and cold (Mock 1998, Atwood and Bontrager 2001). After such periods, gnatcatcher populations can be reduced by as much as 54% (ERCE 1990, Atwood et al 1998, Erickson and Miner 1998). As a result of their fecundity and potential for high weather-related mortality, gnatcatcher populations fluctuate widely between years in stable habitat (Atwood and Bontrager 2001).

### Coastal Cactus Wren

A very prominent but localized feature of sage scrub is thickets of cactus, including coastal cholla (*Opuntia prolifera*) and two prickly pears (*O. littoralis* and *O. oricola*). The cactus wren (*Campylorhynchus brunneicapillus couesi*), a large, blackbird-sized, vocal wren, is an obligate resident of these cactus thickets within coastal sage scrub.

Rea (1986) and Rea and Weaver (1990) published descriptions of the "San Diego cactus wren" (*C. b. sandiegensis*) utilizing seven distinct color characters and separating this subspecies from the northern Baja California subspecies (*C. b. bryanti*) and the subspecies of north coastal southern California, eastern California, and the Sonoran desert of Arizona and Mexico, including Lake Mathews (*C. b. anthonyi*). However, these subspecies were not recognized by the American Ornithologist's Union (AOU), which to date recognizes only one subspecies (*C. b. couesi*) within the United States, inclusive of both the coastal and interior populations.



The coastal cactus wren is presently listed as a California State Species of Special Concern and Cleveland National Forest Federal Sensitive Species (Dudek and Assoc. 2000). In 1993, it was selected as one of three target species in California's Natural Communities Conservation Planning Program (NCCP) and a surrogate for conservation of coastal sage scrub habitat. In September 1990, the U.S. Fish and Wildlife Service (USFWS) was petitioned to recognize the San Diego cactus wren (*C. b. sandiegensis*), as an endangered subspecies pursuant to the Federal Endangered Species Act. In March 1991, the U.S. Fish and Wildlife Service announced the initiation of a status review for the Coastal Cactus Wren. Based on the findings of the AOU Committee on Classification and Nomenclature, it was decided to transfer the coastal population of the cactus wren from Category 2 to category 3B, which includes taxa that do not meet the definition of distinct species under the Endangered Species Act (Department of Interior 1994).

The cactus wren, like the gnatcatcher, is restricted to sage scrub, and its decline can be similarly traced directly to the loss of sage scrub habitat. The loss of approximately 90 percent of this habitat from an estimated 2.5 million acres historically (Westman 1981a, 1981b) and current threats to coastal sage scrub are treated above regarding the California gnatcatcher.

The cactus wren cannot utilize all sub-associations of the remnant sage scrub habitat; its chief requirement is the presence of tall *Opuntia* cacti. Cacti are indispensable to the cactus wren for several reasons: the wrens supplement their insect diet in the fall and winter with fruit from the cacti; dense stands of cactus provide safe shelter; and cacti provide the only firm substrate for the wren's bulky, football-shaped and sized nests. Rea and Weaver (1990) located 584 cactus wren nests; only two were supported by vegetation other than cacti. In addition to the three *Opuntia* species, the vegetative composition of cactus wren home ranges essentially mirrors that of the gnatcatcher. At Otay Mesa in San Diego County, large numbers of both wrens and gnatcatchers occur, and their home ranges are indistinguishable (J. Griffith unpub. data). The two species coexist within identical habitat, provided it contains cactus.

Cactus wrens are permanent residents, never straying far from their cactus patches. Pairs remain faithful between breeding seasons. Nest-building takes 7 to 10 days. Both the male and female construct the nest, although the female chooses the site. Feather and grass lining material is added to the nest throughout incubation. Usually three or 4 eggs are laid. Incubation is done by the female only and requires 16 days; altricial young hatch asynchronously and fledge 19 to 23 days after hatching (Ehrlich et al. 1988). Often two broods are produced each year, sometimes three (ibid).

Nests are used not only for raising young, but also for nighttime roosting throughout the year. Up to a dozen nests are built and maintained in each home range. While nest presence is an excellent indicator of wren presence, present and past, nests cannot be used to determine wren population densities.

Rea and Weaver (1990) report that the cactus wren is more sensitive to passive disturbance than many sage scrub birds and often abandon intact or only slightly impacted home ranges if adjacent areas are developed.

### Least Bell's Vireo

The least Bell's vireo is a small migratory songbird endemic to California and Baja California, Mexico. Early ornithologists regarded the vireo as common to abundant in riparian and adjacent habitats throughout its historic breeding range (Cooper 1874, Grinnell and Miller 1944, Franzreb 1989). Despite the historical abundance and large range of the species, by 1978 only 90 singing males were located range-wide (Goldwasser et al. 1980). The least Bell's vireo had been extirpated from the Central Valley, where 60% to 80% of the historic population occurred (Franzreb 1989), and from the coastal area north from Santa Barbara. The species was subsequently listed as endangered by California in 1980 and by the United States in 1986.

There are two causes to the precipitous population decline, in isolation neither of which might have caused the least Bell's vireo to become endangered. First, more than 95% of the vireo's obligate riparian habitat in the Central Valley was destroyed by agriculture, urban development, flood control and water projects, and mining activities (Smith 1977). Similar losses have occurred throughout Southern California and Baja California (Federal Register 1986, Wilbur 1981). Much habitat was also degraded beyond vireo quality by grazing, invasive exotic plants, and off road vehicles. Second, vireo populations decimated and fragmented by habitat loss and degradation were subjected beginning about 1900 to brood parasitism by the brown-headed cowbird (Grinnell and Miller 1944, Franzreb 1989). As early as the 1940's, Grinnell and Miller (1944) recorded "a noticeable decline in numbers... apparently coincident with an increase of cowbirds" in some locations.

Vireos rarely raise any of their own young when parasitized, unlike many larger cowbird hosts. Persistent parasitism of reduced, fragmented populations led to local extirpations and ultimately the endangered status of the least Bell's vireo.

The riparian habitat preferred by the least Bell's vireo is well defined, often linear, and occurs primarily in the lower, flatter sections of streams and rivers. The vegetation in vireo home ranges is dominated in the tree and shrub layers by several willow species: arroyo willow (*Salix lasiolepis*), black willow (*S. gooddingii*), sandbar willow (*S. hindsiana*), and red willow (*S. lasiandra*). Other trees include Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), California sycamore (*Platanus racemosa*), and coast live oak (*Quercus agrifolia*). Important shrubs include mulefat (*Baccharis glutinosa*), blackberry (*Rubus ursinus*), wild rose (*Rosa californica*), Mexican elderberry (*Sambucus mexicana*), and poison oak (*Toxicodendron diversilobum*). Common herbaceous species include western ragweed (*Ambrosia psilostachya*), mugwort (*Artemisia douglasiana*), stinging nettle (*Urtica holosericea*), and poison hemlock (*Conium maculatum*). Diversity in plant species composition and structure are important components of vireo home ranges and nest sites; monotypic and senescent willow woodland is

generally avoided. Most of the plants listed are used by the vireo for foraging and all are used for nest substrate. The average nest height is 100 cm, the great majority of which are hung in willow (42%) or mulefat (27%) (GWB 1992). Invasive exotic plants like tamarisk (*Tamarix spp.*), giant reed (*Arundo donax*) and *Myoporum spp.* may provide nest substrate but do not provide adequate forage; vireos are absent from monocultures of these plants.

Least Bell's vireos arrive in California from their southern Baja California wintering grounds from late March to mid April. First breeding year males generally settle in areas adjacent to other vireos near their natal home range and are quite site tenacious, returning each year to the same 0.1-2.0 ha breeding territory over their life span (up to 10 years; Griffith field notes). Females may also return to the same breeding territories and males each year, though some change mates and territories between and among years, usually after breeding failures. Males vocalize often (10-25 songs per minute when singing for the first 4-6 hours each day from early April through mid-May), making home ranges easy to locate. Breeding begins upon arrival and continues through July, though most young are fledged in May and early June. The male and female share nest building, incubation, and parenting duties. Usually 3-4 eggs are laid, although clutches of 5 are known and clutches of only 2 are common on third or later (up to seven) nest attempts. Incubation requires 14 days, and the nestling period lasts 10-12 days. Double brooding is common, triple brooding is rare. About 3 weeks after fledging, young vireos can forage on their own, but family groups may remain associated into September. With few exceptions, the least Bell's vireo is absent from breeding areas by the end of September (Griffith and Griffith 2000, GWB field notes).

### Brown-headed Cowbird

The brown-headed cowbird is a small blackbird native to the Great Plains. Cowbirds are brood parasites; they do not build their own nests or raise their own young. Instead, cowbird females lay their eggs in the nests of other birds, called hosts, which then incubate, hatch, and raise the cowbird chick, often at the expense of the host young.

Brown-headed cowbirds first colonized the area west of the Sierra-Cascade axis about 1890 (Rothstein 1994). At that time, the Nevada cowbird (*Molothrus ater artemisiae*) bred in the Great Basin and the dwarf cowbird (*M. a. obscurus*) bred from the Colorado River east to perhaps Texas. The latter invaded the Far West from the east and expanded northward beginning around 1900. The first cowbird documented in Southern California was at Borrego Springs in 1896 (Unitt 1984). By 1930, cowbirds were "well established" throughout Southern California (Willet 1933); by 1955 they had reached British Columbia (Flahaut and Schultz 1955). Cowbirds may not have appeared in the Far West without the unwitting aid of man. However, it is certain large numbers of cowbirds and their devastating impact upon hosts in the region would not have occurred without massive anthropogenic landscape alteration. This includes the provision of year-round cowbird forage by agricultural and livestock operations and the coincident wholesale destruction of native habitats. A history of the cowbird's invasion of the Far West is available in Rothstein (1994).

Cowbirds are extreme generalists and parasitize nearly every species (at least 220) with which they are sympatric (Friedmann 1963, Friedmann and Kiff 1985). Because this lack of host specificity appears to be true even on an individual basis (Fleischer 1985), and because cowbird productivity is generally proportional to the losses host species experience (Rothstein 1990), no feedback processes on ecological or evolutionary time scales lead to the amelioration of parasitism of a particular host. Therefore, unlike most parasites whose fate is closely tied to a specific host, cowbirds may drive a rare species (like the vireo or flycatcher) to extinction with negligible effect upon their own population. In addition, because of their extreme fecundity, even a single female cowbird can reduce the productivity of hosts in a given area such as the Santa Margarita River. In the wild, brown-headed cowbirds lay eggs on 70% to 80% of days during a two- to four-month breeding season for a total of 40 and perhaps as many as 70 eggs (Holford and Roby 1993). Shiny cowbirds are known to lay 120 eggs per year (Kattan 1997).

Cowbird eggs hatch sooner than most host eggs (10-12 days versus 12-16 days), and cowbird young develop faster than host young. Utilizing these advantages, nestling cowbirds often out-compete their host nest-mates. Most small passerine hosts produce a single cowbird chick and none of their own young from parasitized nests. For the vireo, flycatcher, and other small hosts, nest parasitism and nest predation have the same end result (reproductive failure); excepting that after predation the host pair often renests within 2-14 days, while a successful parasitism event may consume the time and energy of an entire breeding season. In addition, California host species did not co-evolve with cowbirds and may have fewer mechanisms against parasitism than hosts elsewhere, such as cowbird egg removal, laying a replacement clutch, or nest abandonment.

In contrast to the increase of cowbirds in distribution and abundance throughout California in this century, populations of most native birds are in general decline, primarily because of their dependence upon increasingly reduced, fragmented, and degraded native habitats in which they are more susceptible to predation and parasitism (Gaines 1974, Goldwasser et al 1980). Thus there is an inverse relationship between the amount of native habitat and associated avian populations, such as the vireo and flycatcher, and the number and subsequent impact of brown-headed cowbirds and predators upon such populations.

It has been repeatedly demonstrated that parasitism of endangered hosts can be dramatically reduced or entirely eliminated by removing cowbirds from host habitat during the breeding season using small, relatively mobile traps placed about 1 km apart within or near to occupied host habitat ("topical trapping") (Griffith and Griffith 2000). Not surprisingly, in areas where cowbird control has been done for five or more years, the abundance and diversity of other host species such as the yellow warbler and yellow-breasted chat has increased markedly (ibid).

## 2008 San Dieguito River Park Survey

The objectives of this study were to document the point location, breeding status, and band status of all individuals and pairs of California gnatcatcher, coastal cactus wren, and least Bell's vireo within the Bernardo Mountain Preserve, San Dieguito River Park, California (Figure 1). A cumulative list of incidentally observed avian species was also compiled.

A similar avian and general biology survey was conducted in a somewhat larger survey area in 2005 (Haas 2006); a survey of the Eastern Mitigation Area was performed in 2006 (GWB 2006).

## **STUDY AREA**

The 2006 survey area was restricted to the Eastern Mitigation Area of the Bernardo Mountain Preserve (Figure 2), much of which burned in 2007. The 2008 survey area included unburned habitat in both the Eastern and Western Mitigation Areas. The topography consists of Bernardo Mountain and its steep slopes and flanks. Elevations ranged from about 300 ft to 1150 ft. The upper elevations and north side burned almost completely (Figure 3); nearly all of the remaining coastal sage scrub habitat occurs along the lower, flatter sections on upslope and downslope of the perimeter road (Figure 4). The climate is typically Mediterranean, with warm dry summers and cool wet winters.

The species composition of coastal sage scrub habitat within the study area follows general descriptions (see Introduction). Other species present included bladderpod (*Isomeris arborea*), bush mallow (*Malacothammus fasciculatus*), California brickellbush (*Brickellia californica*), coyote bush (*Baccharis pilularis*), deerweed (*Lotus scoparius*), Mexican elderberry (*Sambucus mexicana*), monkey flower (*Mimulus spp*), toyon (*Heteromeles arbutifolia*), wild cucumber (*Marah macrocarpus*) and yerba santa (*Eriodictyon trichocalyx*). To a limited extent, historic grazing, fires, and mechanical disturbances of varying degree have fragmented the habitat and allowed the establishment and naturalization of several non-native plants including many grass species, mustard (*Brassica spp*), fennel (*Foeniculum vulgare*), Russian thistle (*Salsola pestifera*), horehound (*Marrubium vulgare*) and others.

The small portion of Felicita Creek included in the survey area contained primarily coast live oak (*Quercus agrifolia*) and California sycamore (*Platanus racemosa*) riparian woodland. Willow-dominated riparian habitat preferred by the least Bell's vireo was found downstream of the study area on Felicita Creek and in several other spots at the margins of Lake Hodges. The oak-sycamore portion of the creek burned heavily. The downstream portions were relatively unscathed.

## METHODS

This study consisted of a simple presence/absence and breeding status protocol survey. No banding of adults or nestlings or data collection regarding habitat, vegetation, or fire history was performed. A cumulative list of incidentally observed avian species was compiled.

The Principal Investigator was J.T. Griffith. The Project Manager was J.C. Griffith. Both hold the requisite permits to perform the requisite work under Section 10(a)(1)(A) of the Endangered Species Act. The San Dieguito Park representative was S. Anderson.

The gnatcatcher surveys were performed per the Coastal California Gnatcatcher Presence/Absence Survey Protocol and Natural Communities Conservation Planning (NCCP) guidelines (USFWS 1997). The cactus wren surveys were performed coincident with the gnatcatcher surveys. The USFWS was notified 10 days in advance of the intent to survey, and was provided with the name of the surveyors and a topographic map of the area to be surveyed. Each area of habitat was surveyed three times, at least one week apart, between 22 March and 12 May (within the 15 February to 15 July survey window); each survey pass required 4 field days (Table 1). Gnatcatchers and wrens were considered to be absent from suitable habitat if they were not located during the three surveys.

Non-protocol surveys were performed for the least Bell's vireo in the limited willow riparian habitat in the survey area. Access to the sage scrub was via the riparian habitat, therefore the riparian habitat was surveyed each survey day (12 times).

All surveys were conducted between 0530 and 1230 hours. Surveys were not performed at temperature below 55 degree F or in periods of excessive heat, wind, rain, fog, or other inclement weather. Taped vocalizations of the gnatcatcher and wren were used to elicit responses. Tapes were not played unless birds were not initially detected, or after birds were located, or for the vireo. The surveys were conducted by slowly walking survey routes, at a pace that allowed complete coverage by sight and sound of all habitat. No more than 100 acres (40ha) of suitable habitat was surveyed per biologist per day.

Data recorded each field day included surveyor name, date, survey area, start and stop information (time, temperature, percent cloud cover, wind speed), photograph or map number, and resurvey polygon number (if applicable). The location of each sensitive bird observed was recorded as a numbered point on an aerial photograph or topographic map. Additional attribute data was recorded for each point in a field data booklet. Attribute data included observation start and stop time, ID number, bands (if any, and if legs were seen), breeding status (single male, single female, pair, family group, nest, fledgling, or juvenile), and GPS location. GPS points were recorded at the approximate center of each breeding territory using a Garmin ETrex handheld GPS unit with WGS 84 UTM grid coordinates.

If complete data (location, band status, and breeding status) were obtained on the initial site survey pass, no further observations of the location were made. If the breeding status or band information were not confirmed during the initial observation, up to 2 more visits were made to the location to collect the required data. After three visits with no observations, gnatcatchers, wrens, and vireos were considered absent.

An effort was made to collect nesting and reproduction data as possible.

## RESULTS

Thirteen (13) California gnatcatcher breeding territories were detected, including 11 pairs and 2 single males (Table 2, Figure 5).

Ten nests were located, and ten family groups were observed (adults with at least one young) (Figure 6). Based on the incomplete data (all nests were not found, and the contents of all found nests were not definitively known), the 11 pairs produced at least 26 young (observed: 2.4 per pair) and as many as 40 young (expected: 3.6 per pair). The latter figure is probably more accurate because more nests were attempted than known, more pairs produced young than observed (some still had active nests when surveys were completed), and more young were produced per pair than observed.

The legs of all males and all but 2 females were observed; no bands were detected.

Cowbirds were observed within the study area, though not in the numbers seen in 2006. No cowbird eggs or young were observed in gnatcatcher nests or family groups.

Five coastal cactus wren home ranges were detected (Table 2, Figure 7). At least one wren pair occupied each location. No bands were observed. Young were not detected, probably because the surveys were completed in early May.

No least Bell's vireo were detected within the survey area or downstream of the survey area in the vireo-quality willow-dominated riparian habitat closer to Lake Hodges.

Sixty-four species of birds were observed in the study area (Table 3). Observations were restricted to the immediate study area; sightings associated with the lake were not reported.

## DISCUSSION AND CONCLUSIONS

The survey area contains high quality California sagebrush-dominated California gnatcatcher habitat with stands of cactus-dominated coastal cactus wren habitat. The survey area contains limited least Bell's vireo habitat (most of the riparian habitat within the survey area is oak-sycamore). Vireo-quality willow-dominated riparian habitat occurs immediately downstream of the limited survey area on Felicita Creek and at the margins of Lake Hodges.

The gnatcatchers and cactus wrens present are restricted to within the remaining unburned habitat upslope and downslope from the main perimeter trail. There is little vacant habitat, especially for the cactus wren.

Brown-headed cowbirds were observed in the survey area. No cowbird eggs or young were observed in gnatcatcher nests or family groups. Cowbird brood parasitism can negatively impact gnatcatcher reproduction success, as documented in 2006. Cowbirds puncture or remove host eggs, and cowbird chicks out-compete and smother host young.

## MANAGEMENT RECOMMENDATIONS

1. Periodically conduct protocol gnatcatcher/cactus wren and vireo presence/absence-breeding status surveys in all suitable habitat within San Dieguito River Park. Gnatcatcher surveys should be completed as possible between 15 February and 15 May. Vireo surveys should be completed as possible between 15 April and 15 June.
2. Implement brown-headed cowbird trapping program in all gnatcatcher and vireo habitat in the entire San Dieguito River Park (occupied or not). The range of influence of each trap is roughly a 1 km radius circle.
3. Periodically conduct gnatcatcher and vireo nest monitoring to measure the efficacy of the trapping program.



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Figure 1. 2008 avian survey project location, San Dieguito River Park, California.

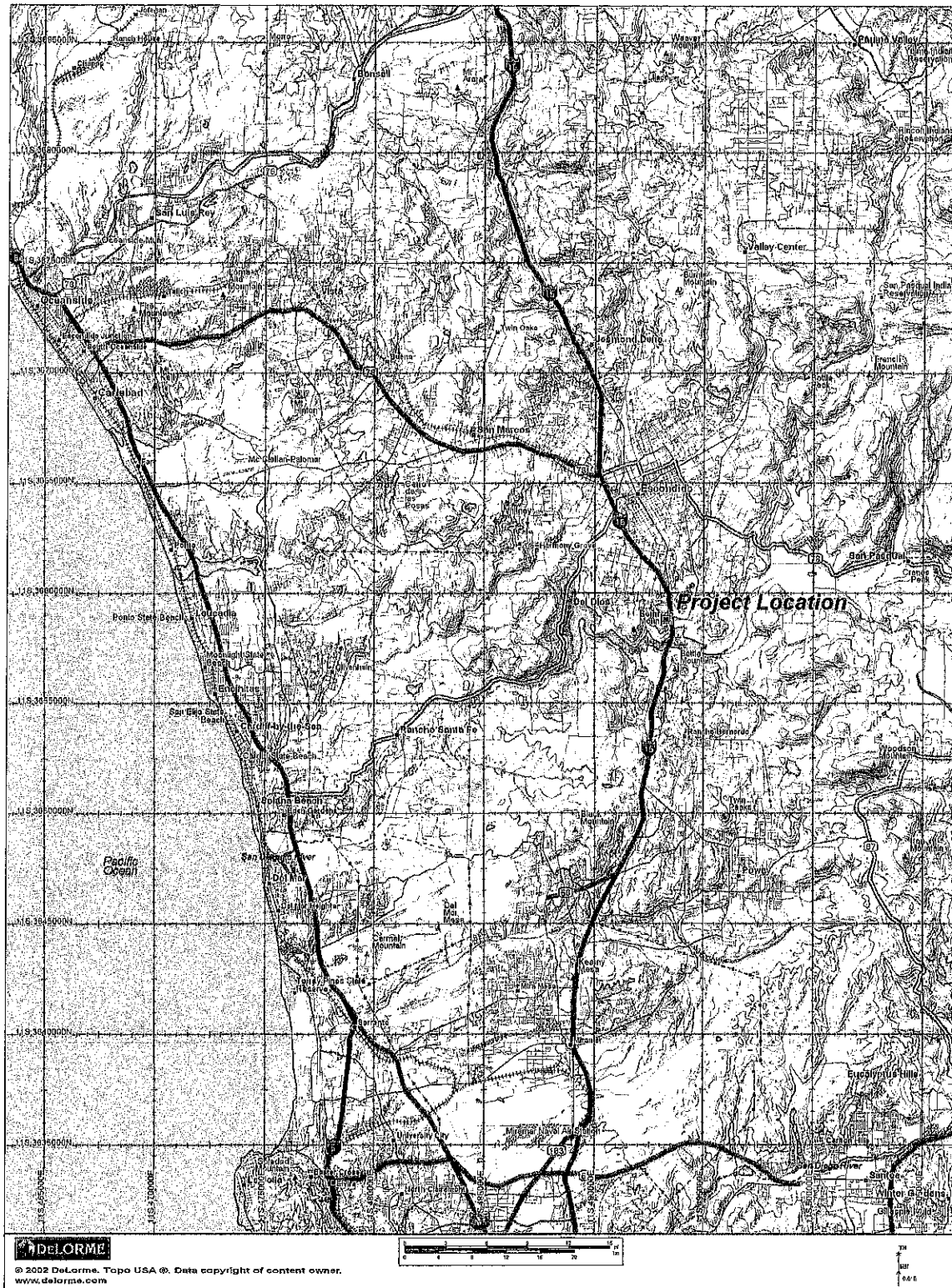


Figure 2. 2008 avian survey study area, Eastern and Western Mitigation Area, Bernardo Mountain Preserve, San Dieguito River Park, California.

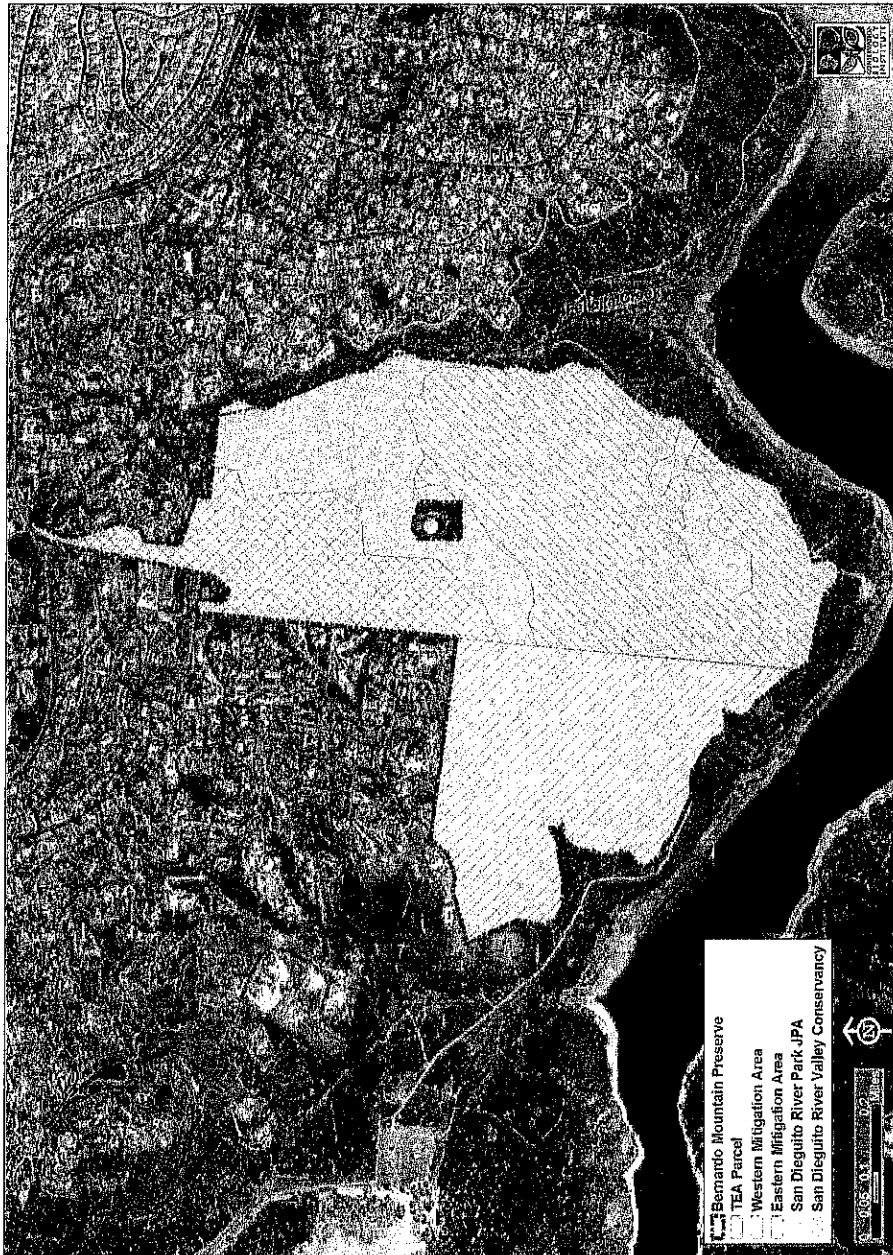


Figure 3. Damage from October 2007 Witch Fire at Bernardo Mountain Preserve, San Dieguito River Park, California, as seen in spring 2008.

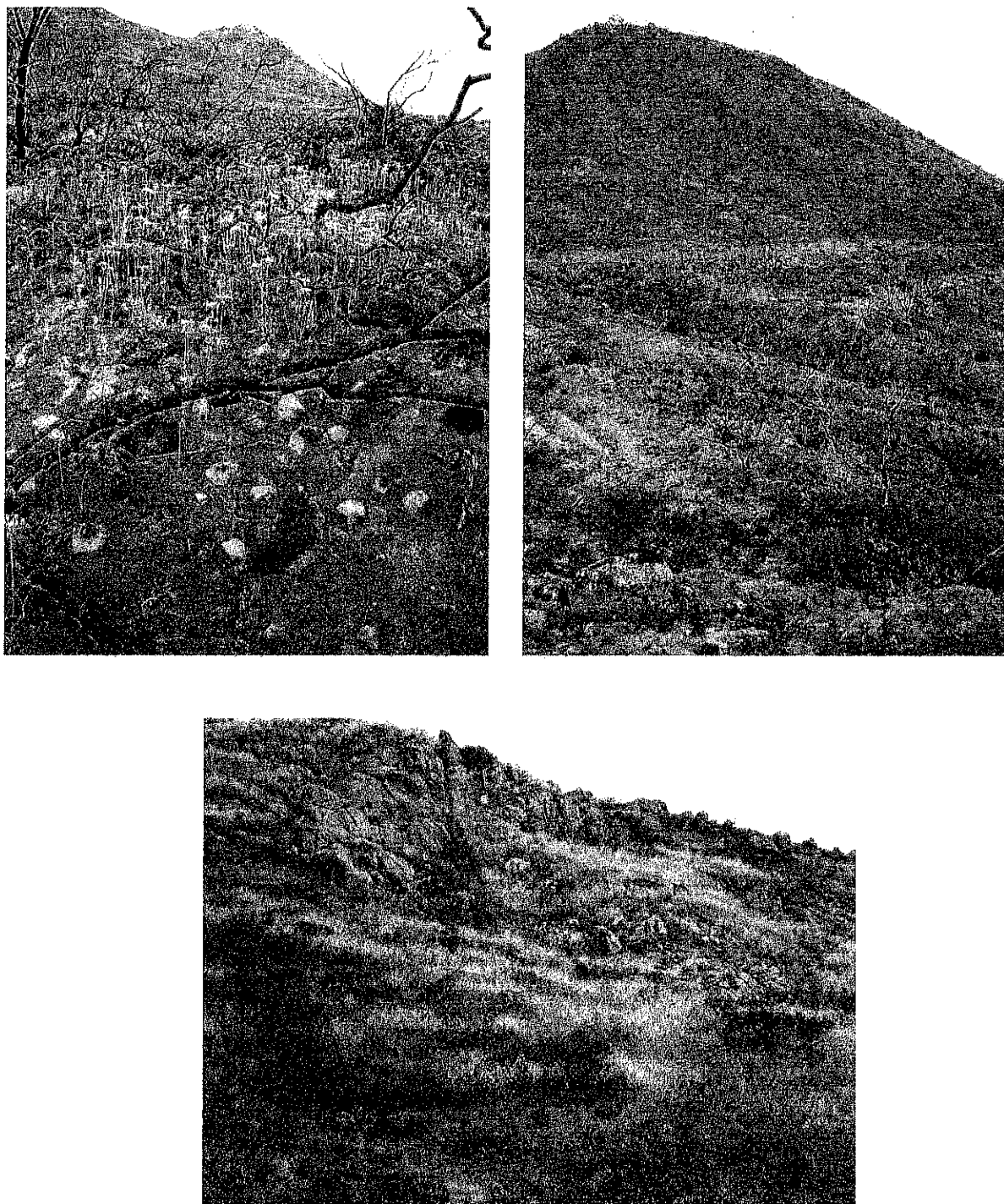




Figure 3. (continued)



Figure 4. Intact sage scrub habitat occupied by the California gnatcatcher at Bernardo Mountain Preserve, San Dieguito River Park, California, in 2008.

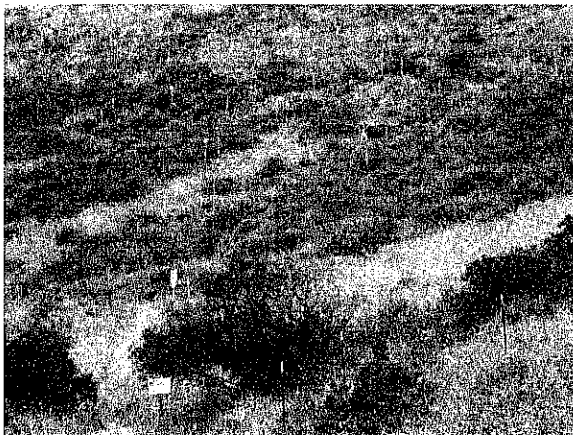
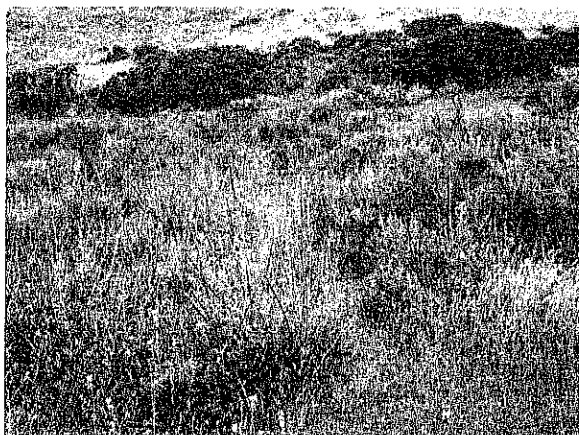


Figure 5. Sites occupied by the California gnatcatcher at Bernardo Mountain Preserve, San Dieguito River Park, California, in 2008.



Note: gnatcatchers were distributed within remaining unburned habitat, which occurred in a band upslope and downslope of the perimeter road.

Figure 6. California gnatcatcher nests at San Dieguito River Park, California, in 2008.





Figure 7. Sites occupied by the coastal cactus wren at Bernardo Mountain Preserve, San Dieguito River Park, California, in 2008.



Table 1. Avian survey dates, times, and conditions at Bernardo Mountain Preserve, San Dieguito River Park, California, in 2008.

Date	Time <sup>1</sup>		Temperature (F)		Wind (avg mph)		Cloud%	
	start	stop	start	stop	start	stop	start	stop
22-Mar	630	1130	51.4	76.7	0	1.4	0	0
23-Mar	630	1130	52.2	94.6	1.4	2.5	0	0
28-Mar	630	1100	55.8	57.4	1	1.8	100	100
29-Mar	630	1200	56.4	66.2	2	1.9	100	100
3-Apr	800	1145	55.2	62.2	0	3.7	100	100
4-Apr	620	1130	57.2	76.6	0	2.7	100	0
5-Apr	645	1045	58	64.1	1.5	2.6	100	100
6-Apr	640	1200	55.1	67.5	0.2	1.1	100	85
9-May	600	1100	56	73.4	0	2.7	100	0
10-May	600	1230	55	74.7	0.3	3.9	100	0
11-May	600	1200	59	68	0	2.2	100	70
12-May	600	1145	57	63	0	3.6	100	100

1: Field time. Does not include travel to and from site.

Table 2. Location, breeding status, and reproductive activity of the California gnatcatcher (cagn) and coastal cactus wren (ccwr) at Bernardo Mountain Preserve, San Dieguito River Park, California.

Species	Breeding	Bands		UTM Coordinates		Nest		Fledglings	
		M	F	Easting	Northing	Plant	Ht cm	min	max
cagn 1	pair	no	no	492200	3658186	saap	48	4	4
cagn 2	pair	no	no	492244	3658059	arca	85	3	4
cagn 3	pair	no	no	491980	3657852	erfa	56	3	4
cagn 4	pair	no	dns	491900	3657800			3	4
cagn 5	pair	no	no	491810	3657734	enfa	87		
cagn 6	pair	no	no	491773	3657681	arca	35		
cagn 7	pair	no	no	491690	3657712	enfa	48	3	4
	n2					arca		0	4
cagn 9	pair	no	no	491528	3657828	same	124	fail	
	n2			491598	3657864	enfa	60	0	4
cagn 11	single male	no		491346	3657974				
cagn 12	pair	no	no	491320	3658049	arca	94	4	4
cagn 13	pair	no	no	491184	3658026			4	4
cagn 14	pair	no	dns	491090	3658080			2	4
cagn 15	single male	no		491130	3658042				
13	locations					min F	(obs)	26	
11	pairs					max F	(exp)		40
2	single males								
ccwr 1	pair			491917	3657805				
ccwr 2	pair			491553	3657722				
ccwr 3	pair			491436	3657900				
ccwr 4	pair			491398	3657948				
ccwr 5	pair			491110	3658077				
5	locations								
5	pairs								

arca: California sagebrush

enfa: Canyon sunflower

erfa: Flat-topped buckwheat

saap: White sage

same: Black sage

Table 3. Cumulative list of avian species incidentally observed at Bernardo Mountain Preserve, San Dieguito River Park, California, in 2008.

Canada goose	Barn swallow
Mallard	Oak titmouse
California quail	Bushtit
Great blue heron	Coastal cactus wren
Great egret	Bewick's wren
Green heron	House wren
Black-crowned night heron	California gnatcatcher
Turkey vulture	Blue-gray gnatcatcher
Cooper's hawk	Wrentit
Red-shouldered hawk	Northern mockingbird
Red-tailed hawk	California thrasher
Killdeer	European starling
Rock dove	Phainopepla
Mourning dove	Orange-crowned warbler
Great horned owl	Yellow-rumped warbler
White-throated swift	Common yellowthroat
Black-chinned hummingbird	Wilson's warbler
Anna's hummingbird	Western tanager
Costa's hummingbird	Spotted towhee
Nuttall's woodpecker	California towhee
Pacific slope flycatcher	Rufous-crowned sparrow
Black phoebe	Song sparrow
Ash-throated flycatcher	White-crowned sparrow
Cassin's kingbird	Golden-crowned sparrow
Western kingbird	Black-headed grosbeak
Hutton's vireo	Blue grosbeak
Western scrub jay	Red-winged blackbird
American crow	Brown-headed cowbird
Common raven	Bullock's oriole
Horned lark	House finch
Tree swallow	Lesser goldfinch
Cliff swallow	American goldfinch

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64 species

Note: Includes only observations within immediate study area (not lake).