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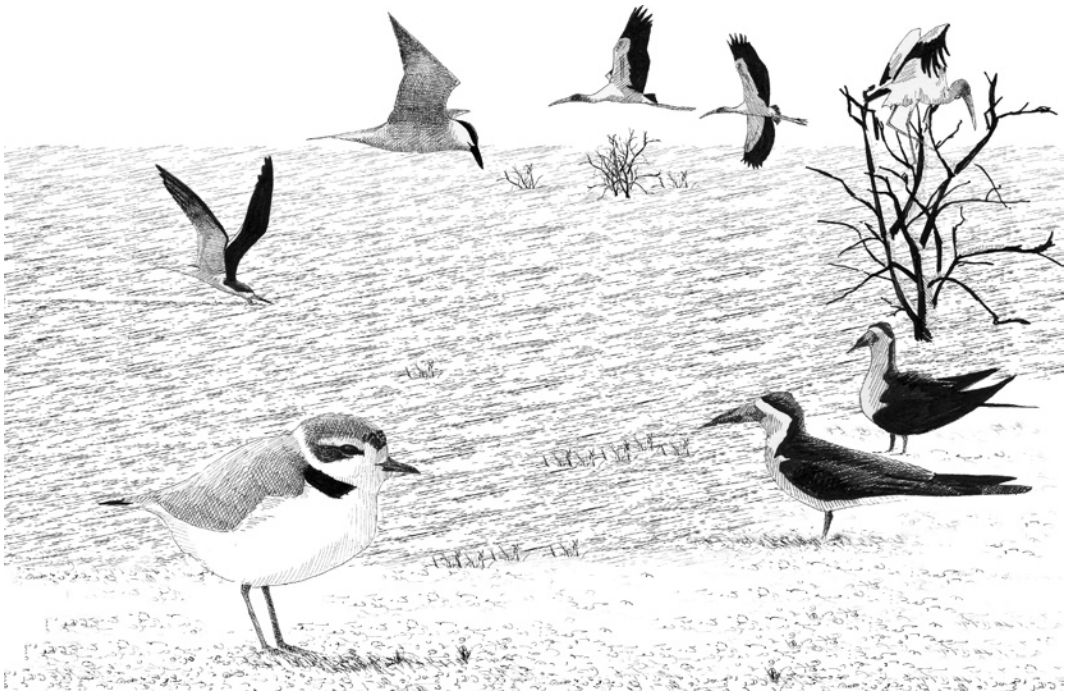
SPECIES ACCOUNTS



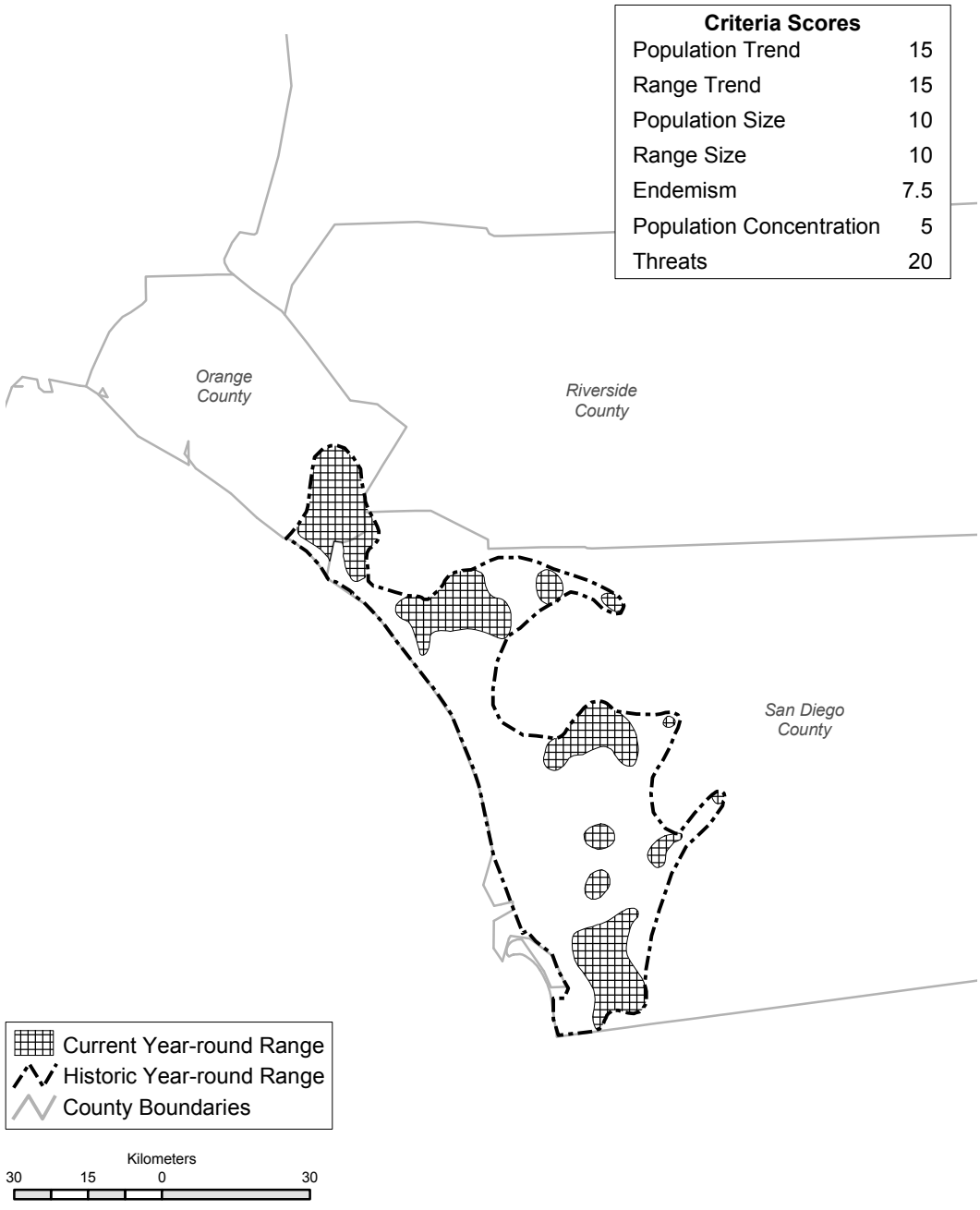
Andy Birch

PDF of San Diego Cactus Wren account from:

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

SAN DIEGO CACTUS WREN
(*Campylorhynchus brunneicapillus sandiegensis*)

Philip Unitt



Current and historic (ca. 1944) year-round range of the San Diego Cactus Wren in California, where restricted to disjunct patches on the coastal slope of Orange and San Diego counties. The subspecies' range has retracted considerably in San Diego County, and overall numbers have declined greatly. The northern limits of the range, mapped here on the basis of assessment of birds in the field by K. L. Weaver, are uncertain because of the lack of specimens over most of Orange County.

Special Concern Priority

Currently considered a Bird Species of Special Concern (year round), priority 1. Included on CDFG's (1992) unprioritized list but not on the original prioritized list (Remsen 1978).

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment (Sauer et al. 2005).

General Range and Abundance

The Cactus Wren (*Campylorynchus brunneicapillus*) is resident in arid and semiarid regions from southern California, southern Nevada, extreme southwestern Utah, central Arizona, central New Mexico, and central and southern Texas south in Mexico to southern Baja California, central Sinaloa in the Pacific lowlands, northern Michoacán and Hidalgo in the central highlands, and Tamaulipas on the Atlantic slope (AOU 1998, Proudfoot et al. 2000). The species is considered "common" over much of its range, and the Breeding Bird Survey shows densities in the United States highest in southern Arizona and southwestern Texas (Sauer et al. 2005).

Recent classifications recognize eight subspecies falling roughly in two groups, *affinis* group (peninsular forms of Baja California, 2 subspecies) and *brunneicapillus* group (continental forms, at least 4 subspecies), with two subspecies including *sandiegensis* intermediate between the groups (summarized in Proudfoot et al. 2000).

The San Diego Cactus Wren (*C. b. sandiegensis*) has a very limited range, extending from extreme northwestern Baja California (Valle de las Palmas) north through the coastal lowlands of San Diego County and apparently into southern Orange County (Rea and Weaver 1990). The northern limit of the range is uncertain because of the lack of specimens from northwestern San Diego County and most of Orange County. Differences in song (slower frequency and lower pitch in *sandiegensis*) and visual assessments of birds in the field (K. L. Weaver pers. comm.) suggest that southern Orange County is the northern limit of the subspecies' range. In Orange County, Weaver (unpubl. data) found the wrens at Starr Ranch Sanctuary and a single individual at San Clemente to appear closer to *sandiegensis*, those at Caspers Regional Park to look intermediate, though with features of *sandiegensis* being frequent. He found that birds at Laguna Beach to showed mostly features of *C. b. anthonyi*, while all those at El Toro, Trabuco Canyon, Buena Park, and Brea looked like *anthonyi*. Specimens from extreme northern Orange County are *anthonyi* (Rea and Weaver 1990). Most of the range of *sandiegensis* south of the Mexican border has been covered by the city of Tijuana, so the long-term viability of the population in Baja California is doubtful.

Some have disputed the subspecific validity of *sandiegensis* (unpublished letters reported in Beattie 1994), but no interpretations other than that of Rea and Weaver have yet been published. Conversely, a genetic study (Eggert 1996) found evidence of population isolation beyond that suggested by the subspecies' external characters.

Seasonal Status in California

Like all other subspecies of this wren, a sedentary resident. Breeds mainly from early March through July (Unitt 2004). Only short-distance dispersal by immatures from their natal territories is likely, as occurrences even a few kilometers from known sites of residency are very rare (Unitt 2004). Fieldwork for the San Diego County bird atlas, 1997–2001, revealed just two winter records of Cactus Wrens at distances greater than 5 km from known breeding areas.

Historic Range and Abundance in California

Because of its restriction to stands of chollas and prickly pears, the San Diego Cactus Wren has always had a rather patchy range (Bancroft 1923). Nevertheless, it was formerly widespread and "abundant" at elevations below 300 m (1000 ft) in coastal San Diego County (Stephens 1921), especially in the area now covered by the inner city of San Diego (Rea and Weaver 1990, SDNHM specimens). Lack of detailed historical information on birds in Orange County prevents a definite statement on the Cactus Wren's past status there. Grinnell and Miller (1944) commented, "range on coastal slope of southern California now much restricted as compared with condition in 1880s and 1890s, owing to great reduction of requisite habitat."

Recent Range and Abundance in California

Currently the San Diego Cactus Wren has an extremely localized distribution (see map). Rea and Weaver (1990) listed 86 sites in California (some close enough to each other to be considered

one extended site). They mapped the species as extirpated in the 1980s at 26 of these sites and discussed former occurrence on the south-facing slopes just north of northern San Diego County's coastal lagoons, where the Cactus Wren was eliminated by urbanization during the 1980s. Subsequent records submitted to the California Natural Diversity Database added 8 sites. Fieldwork for the San Diego County bird atlas, 1997–2001, added about 18 additional sites and relocated the species near 6 sites where Rea and Weaver (1990) thought it extirpated. The "population" at several of these sites, however, consists of as few as a single individual and therefore may be ephemeral or not viable.

Numbers of Cactus Wrens may be larger in Orange County than in San Diego County. Mock (1993) estimated 1200–1600 individuals in Orange County, though a large fraction of these may be closer to *C. b. anthonyi* than to *sandiegensis*. Gallagher (1997) mapped the Cactus Wren as occurring in 44 of 110 atlas blocks (5 km by 5 km) in Orange County and listed 10 additional poorly covered blocks where the species could have been missed by the Orange County bird atlas effort. Only 10 of these 54 blocks, however, coincide with locations mapped as *sandiegensis* by Rea and Weaver (1990).

In San Diego County, the San Diego Cactus Wren is now concentrated in four core regions: southern Camp Pendleton/Fallbrook Naval Weapons Station (70 pairs), Lake Hodges/San Pasqual (90 pairs), Lake Jennings (25 pairs; the site burned in the 2003 Cedar fire, destroying most of the occupied wren habitat; D. Mayer pers. comm.), and Sweetwater/Otay (extending from Dictionary Hill on the north to Otay Mesa on the south, from Euclid Avenue on the west to Upper and Lower Otay lakes on the east; 80 pairs; Mock 1993). Other San Diego County sites combined contribute probably fewer than 50 individuals. The total population of the subspecies in this county is now undoubtedly below the 400 pairs estimated by Rea and Weaver (1990).

Ecological Requirements

Rea and Weaver (1990) described the San Diego Cactus Wren's habitat thoroughly. The key habitat element is thickets of chollas (*Opuntia prolifera*) or prickly-pear cacti (*O. littoralis*, *O. oricola*) tall enough to support and protect the birds' nests. In the Lake Hodges/San Pasqual area, Weaver (in Rea and Weaver 1990) found 13 San Diego Cactus Wren territories to range in size from 0.8 to 2.0 ha, averaging 1.3 ha. Not all the territory need consist of cactus thickets; D. Bontrager (in Gallagher 1997) found Cactus Wrens in Orange County nesting in relict stands of cactus as small as 0.04 to 0.08 ha surrounded by grassland. In southeast San Diego and on Dictionary Hill, San Diego Cactus Wrens make some use of spiny ornamental garden plants (pers. obs.). It appears that the precise makeup of the habitat surrounding suitable cactus thickets is not critical. Typically, however, the San Diego Cactus Wren's habitat consists of coastal sage scrub at elevations below 460 m (1500 ft) in which cacti are prominent. Suitable conditions are found on south-facing slopes, at bases of hillsides, or in dry washes (Rea and Weaver 1990).

The Cactus Wren's characteristic nest is a hollow football-shaped structure with the entrance hole at one end. San Diego Cactus Wrens build their nests in chollas or prickly-pears almost exclusively. The median height of a sample of 98 cacti used for nesting was 138 cm (range = 74–226 cm), and the median height of nests above ground was 94 cm (range = 40–165 cm; Rea and Weaver 1990). Cactus Wrens may raise more than one brood per season (Proudfoot et al. 2000).

Cactus Wrens forage extensively on the ground, turning over fallen leaves or other debris in search of prey, which they also secure by searching bushes and probing tree bark (Proudfoot et al. 2000). They are primarily insectivorous, their diet including beetles, ants and wasps, grasshoppers, butterflies and moths, true bugs, and spiders, but also lesser amounts of vegetation (fruit pulp and seeds) and, rarely, amphibians and reptiles. San Diego Cactus Wrens supplement their insect diet in fall and winter with the fruits of two species of *Opuntia* (Rea and Weaver 1990).

Threats

Habitat destruction from urban sprawl threatens the San Diego Cactus Wren gravely. Dawson (1923) recognized this, and the threat has only intensified since. Currently, massive construction of housing tracts in eastern Chula Vista is taking place in much of the habitat for the Sweetwater/Otay population. The pressure from urbanization in the rest of the subspecies' range is also great. Two freeways currently being built or scheduled for construction, the Foothill Transportation Corridor in southern Orange County and Highway 125 in the Sweetwater/Otay region of southern San Diego County, cut through two of the largest known populations and eliminate occupied habitat. The environmental impact statement for Highway 125

specifies elimination of 11 Cactus Wren territories (V. Marquez pers. comm.). Recent public acquisitions of significant tracts of coastal sage scrub for San Diego County's multiple-species conservation plan lie largely farther inland than cactus thickets and hence include few if any Cactus Wren sites. With the population so reduced and fragmented, the long-term viability of what remains is an open question (Mock 1993).

Rea and Weaver (1990) also identified fire as a threat to the San Diego Cactus Wren, citing Benson (1969) in calling fire "the chief limiting factor in the distribution of cacti in southern California." The long time required for a burned cactus thicket to regrow to a height sufficient for nesting Cactus Wrens can result in the species' dying out in burned habitat. One year after the Laguna Canyon fire in the San Joaquin Hills, Orange County, the population of Cactus Wrens was down 72% (Bontrager et al. 1995). Burning of San Diego Cactus Wren habitat is of greatest concern on military bases, where artillery frequently starts fires. The Cedar Fire of October 2003 burned much of the habitat of the Lake Jennings population, including 14 ha purchased as Cactus Wren habitat. In this area, the fire reduced 7 pairs to 2 pairs. Caltrans is transplanting cacti to this site (L. Comrack pers. comm.).

Degradation of habitat can happen even on lands with conservation easements, especially where these are adjacent to housing and receive heavy human foot traffic. In Rice Canyon, Chula Vista, in designated open space supporting Cactus Wrens surrounded by recent urbanization, schoolchildren were recruited to plant oak trees (V. Marquez pers. comm.)!

Habitat fragmentation may compound the negative effect of habitat destruction. Rea and Weaver (1990) noted that during the 1980s all 26 sites where they documented the bird's disappearance had supported fewer than five pairs and that at 18 of these sites the extent of the habitat still appeared sufficient to support at least one pair. If the habitat is adequate, however, rather isolated populations may persist. At Malcolm X Library in southeast San Diego, in partly degraded sage scrub isolated for decades from the rest of the Sweetwater/Otay population, about six pairs persisted from 1997 through 2001 (Unitt unpubl. data.).

A population-viability analysis encompassing the Lake Hodges/San Pasqual, Lake Jennings, and Sweetwater/Otay populations, assuming productivity and survival rates typical for songbirds, estimated extinction probabilities over 200 years ranging from 7% to 35%, variations arising from variations in these assumed rates and whether or not a dispersal rate between the populations of 1% per year is allowed (Mock 1993). Under current plans, however, even these 200 pairs are not sustained. The final multiple-species conservation plan for the region encompassing these three populations specifies that just 60% of the maritime succulent scrub in it will be conserved. The plan, however, includes agency commitments to restore and expand cactus habitats adjacent to conserved Cactus Wren populations (P. J. Mock in litt.).

The San Diego Cactus Wren has benefited to some extent from the listing of the California Gnatcatcher as federally threatened, since almost all of the wren's sites also support the gnatcatcher, but because of the wren's specializations greater conservation measures for it are needed.

Management and Research Recommendations

The recommendations by Rea and Weaver (1990) for conservation of the San Diego Cactus Wren apply now more than ever.

- Protect all remaining core sites, and as many others as possible, from urbanization and from highway building and widening, and compensate for any more lost habitat by restoring cacti in previously degraded areas.
- Restore and enhance (through planting of cacti) sage scrub around current sites.
- Develop a recovery plan that identifies all sites, determines the ownership status and conservation potential of each, and outlines a strategy for the conservation and management of these sites. Between the list of Rea and Weaver (1990), San Diego County bird atlas results, and surveys made by environmental consultants, probably all sites have already been identified, if the results of surveys on private lands can be extracted.
- Put occupied sites into public ownership or conservation easements, even though many of these will fall outside of the framework of San Diego's multiple-species conservation plan and will entail modifications of this plan.
- Experiment with cacti in landscaping at developed areas near occupied sites. Though the San Diego Cactus Wren appears far less adaptable to urbanization than the desert subspecies, its persistence in some isolated pockets of habitat suggests that conservation of patches of occupied habitat within

urbanized areas may offer some conservation potential if preservation of large blocks of habitat fails.
- Conduct studies of the subspecies' breeding ecology, including nesting success and its relationship to habitat and landscape features, to better identify ideal habitat and thereby guide restoration efforts. Identify the minimum habitat patch size needed to support wrens in the long term, and determine juvenile dispersal distances so restoration sites are located close enough to source populations.
- Investigate rates of recovery of cactus and reoccupation by wrens in burned areas.
- Study the effectiveness of planting or transplanting of cacti and wrens' use of restored habitat.
- Conduct research in urban and suburban settings to assess the characteristics of sites that enable the long-term viability of wren populations.
- Investigate, ideally with whole specimens, the characters of the Cactus Wrens of Orange County. At a minimum, the material needed is rectrices 3–5 from one side of the tail as well as color photographs showing both the upperparts and underparts of fresh-plumaged birds (Oct–Dec), taken from directly above and below.

Monitoring Needs

A complete survey of all sites for the San Diego Cactus Wren is needed urgently, in tandem with an effort to identify all suitable habitat (easily done from existing vegetation maps and possibly aerial photos, on which extensive cactus thickets may be visible). Regular standardized monitoring of the populations on lands owned by government or public-trust agencies (Department of Defense: Camp Pendleton, Fallbrook Naval Weapons Station; city of San Diego: Lake Hodges, San Diego Wild Animal Park; California State Parks: San Pasqual Battlefield State Historic Park; Sweetwater Authority: Sweetwater Reservoir; San Diego County parks department: Sweetwater County Park; U.S. Fish and Wildlife Service: San Diego NWR) is especially important so that the long-term viability of wrens inhabiting even conserved habitat can be assessed. Because of the rapidity of decreases documented by Rea and Weaver (1990), this monitoring should be done annually if possible, every three years at the minimum. It also would be valuable to monitor restoration sites to see whether wrens colonize them and then maintain their numbers over time and to monitor burn sites to assess long-term patterns of wren use.

Acknowledgments

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Literature Cited

American Ornithologists' Union (AOU). 1998. Checklist of North American Birds, 7th ed. Am. Ornithol. Union, Washington, DC.

Bancroft, G. 1923. Some geographic notes on the Cactus Wren. Condor 25:165–168.

Beattie, M. H. 1994. Endangered and threatened wildlife and plants; 1-year finding for a petition to list the Pacific coast population of the Cactus Wren under the Endangered Species Act. Federal Register 59:45659–45661.

Benson, L. 1969. The Native Cacti of California. Stanford Univ. Press, Stanford, CA.

Bontrager, D. R., Erickson, R. A., and Hamilton, R. A. 1995. Impacts of the October 1993 Laguna Canyon fire on California Gnatcatchers and Cactus Wrens, in Brushfires in California wildlands: Ecology and resource management (J. E. Keeley and T. Scott, eds.), pp. 69–76. Int. Assoc. Wildland Fire, Fairfield, WA.

California Department of Fish and Game (CDFG). 1992. Bird species of special concern. Unpublished list, July 1992, Calif. Dept. Fish & Game, 1416 Ninth St., Sacramento, CA 95814.

Dawson, W. D. 1923. The Birds of California. South Moulton Co., San Diego.

Eggert, L. S. 1996. A phylogeographic approach to management of coastal California Cactus Wrens (*Campylorhynchus brunneicapillus*). M.S. thesis, San Diego State Univ., San Diego.

Gallagher, S. R., ed. 1997. Atlas of Breeding Birds, Orange County, California. Sea and Sage Audubon Press, Irvine, CA.

Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Mock, P. J. 1993. Population viability analysis for the coastal Cactus Wren within the MSCP study area. Report to Clean Water Program, city of San Diego. Ogden Environmental and Energy Services Co., 5510 Morehouse Dr., San Diego, CA 92121.

Proudfoot, G. A., Sherry, D. A., and Johnson, S. 2000. Cactus Wren (*Campylorynchus brunneicapillus*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 558. Birds N. Am., Philadelphia.

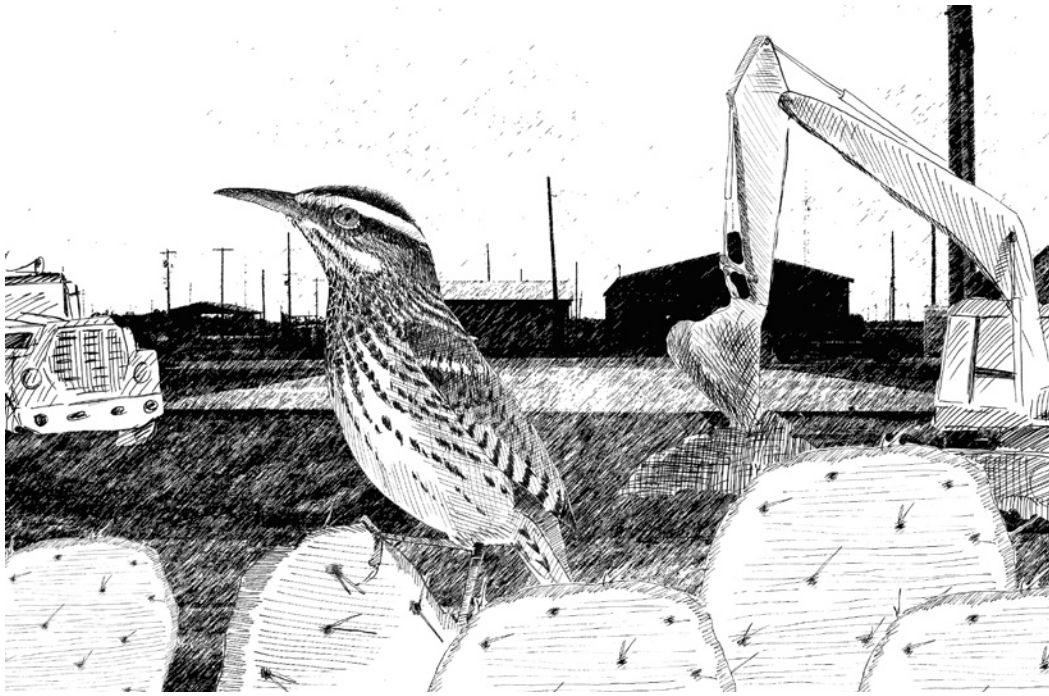
Rea, A. M., and Weaver, K. L. 1990. The taxonomy, distribution, and status of coastal California Cactus Wrens. W. Birds 21:82–126.

Remsen, J. V., Jr. 1978. Bird species of special concern in California: An annotated list of declining or vulnerable bird species. Nongame Wildl. Invest., Wildl. Mgmt. Branch Admin. Rep. 78-1, Calif. Dept. Fish & Game, 1416 Ninth St., Sacramento, CA 95814.

Sauer, J. R., Hines, J. E., and Fallon, J. 2005. The North American Breeding Bird Survey, results and analysis 1966–2004, version 2005.2. USGS Patuxent Wildl. Res. Ctr., Laurel, MD. Available at www.mbr-pwrc.usgs.gov/bbs/bbs.html.

Stephens, F. 1921. An annotated list of the birds of San Diego County, California. Trans. San Diego Soc. Nat. Hist. 3:142–180.

Unitt, P. 2004. San Diego County bird atlas. Proc. San Diego Soc. Nat Hist. 39.



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