

OCCURRENCES OF THREE SPECIES OF GNATCATCHERS IN THE SAN GORGONIO PASS, CALIFORNIA

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ABSTRACT: The San Gorgonio Pass is an important zone of interchange between desert and coastal flora and fauna in southern California. We report multiple recent observations of California Gnatcatchers (*Polioptila californica*) within the pass, apparently persisting since their first documentation in 1908. While the Blue-gray Gnatcatcher (*P. caerulea*) has been documented here for more than a century, the occurrence of the California Gnatcatcher in this area is not widely known and not included in recent distribution maps for this threatened species. We also report the expansion of the Black-tailed Gnatcatcher (*P. melanura*) into the pass in recent decades, forming one of the few zones of overlap between these two species. With its elevational gradients, vegetation mosaics, and shifting species ranges the San Gorgonio Pass serves as a potential refugium from various anthropogenic stressors including climate change. The pass is currently subject to piecemeal development and lacks any significant conservation areas. It deserves more comprehensive conservation planning attention.

In Riverside County, California, at 250–800 meters above sea level, the San Gorgonio Pass is a low east–west trending valley separating the San Bernardino Mountains (elevation 3500 m) to the north from the San Jacinto Mountains (elevation 3285 m) to the south (Figure 1). Although bisected lengthwise by Interstate 10 and urban development, the valley floor retains substantial native habitat, which consists mostly of open scrubland dominated by desert willow (*Chilopsis linearis*), catclaw (*Senegalia greggii*), and deerweed (*Acmispon glaber*), with a greater cover of brittlebush (*Encelia farinosa*) and creosote (*Larrea tridentata*) toward the east end and greater cover of chamise (*Adenostoma fasciculatum*) and black sage (*Salvia mellifera*) toward the west end. Throughout, there are occasional trees, mostly sycamore (*Platanus racemosa*), and succulents, mostly silver cholla (*Cylindropuntia echinocarpa*). Both the northern and southern slopes have steep elevational gradients that transition up to chaparral and eventually coniferous woodland.

The San Gorgonio Pass connects the Coachella Valley and its desert habitats to the east with the Santa Ana River and San Jacinto River valleys in more coastal climates to the west. As such it is a frequent contact zone between closely related species and subspecies, between the low deserts and coastal plain, as well as between the two high mountain ranges. It also serves as an

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FIGURE 1. Sites of California Gnatcatcher occurrences in the San Gorgonio Pass cited in the text.

important corridor for faunal interchange between interior desert and coastal habitats and thus may play an important role in a future of shifting climate and vegetation patterns. For instance, the San Gorgonio Pass is likely the conduit for the recent colonization of the upper Santa Ana River, west of the pass, by the Ladder-backed Woodpecker (*Dryobates scalaris*), which was previously resident only to the east of the pass in desert habitats (House et al. 2010), and at Valle Vista to the south, where it formerly occurred in a pocket of desert habitat along with other characteristically desert species (Grinnell and Swarth 1913).

One interesting pairing of species within this contact zone is the Black-tailed Gnatcatcher (*Poliophtila melanura*), resident in low-elevation desert scrub to the east, and the California Gnatcatcher (*P. californica*), resident in low-elevation coastal scrub to the west. These two species rarely overlap (Weaver 1998). In 1993 the U.S. Fish and Wildlife Service listed the subspecies of the California Gnatcatcher occurring within the U.S., the Coastal California Gnatcatcher (*P. c. californica*), as a threatened species, but despite extensive research and survey effort before and since, its distribution in some parts of its range remains somewhat uncertain. Although several efforts have attempted to predict the species' distribution in the U.S. (e.g., Atwood 1980, Atwood and Bolsinger 1992, Mock 1998, U.S. Fish and Wildlife Service 2000), new range limits are found regularly (Cooper et al. 2017, Couffer 2019), or may be in flux (Hulton VanTassel et al. 2017). In its 5-year review of the status of the California Gnatcatcher, the United States Fish and Wildlife Service (2010) did not include the San Gorgonio Pass within the range of the species.

Root (1988) and Mock (1998), respectively, correlated the northern limits of the ranges of the Black-tailed and California Gnatcatchers with winter minimum temperatures. They postulated that low winter minimum temperatures increase metabolic stress for these small, resident songbirds, limiting their survivorship and reducing population densities at the range margins. With predicted increases in both maximum temperatures and mean minimum temperatures, these metabolic boundaries may shift to the north and upslope, resulting in shifting distributions in these two species.

On 10 and 24 May 1908, as part of a survey of the San Jacinto Mountains led by Joseph Grinnell, Charles F. Richardson and Walter P. Taylor collected two male California Gnatcatchers near Cabazon, in the central portion of the pass; they are deposited in the Museum of Vertebrate Zoology at the University of California, Berkeley (MVZ 1743, 1744). Richardson and Taylor also found the species farther west, at the base of the San Jacinto Mountains near Banning. They found no Black-tailed Gnatcatchers in the pass during these surveys, the nearest at that time being in low desert at Palm Springs, over 10 km southeast of Whitewater at the east end of the pass (Grinnell and Swarth 1913).

From 2008 to 2012, as part of an effort to resurvey the sites visited by the 1908 Grinnell survey team, the San Diego Natural History Museum conducted extensive surveys within the San Gorgonio Pass (Hargrove et al. 2014). We made three separate visits each to Cabazon, Snow Creek/Whitewater, and Banning, with five days per visit at each site. From 1 May 1908 to 16 June 1908, Taylor and Richardson spent approximately 22 days at Cabazon, 15 days at Snow Creek/Whitewater, and 11 days at Banning. In 1908, "Whitewater" referred to the original Palm Springs train station near the corner of the current Highway 111 and Tipton Road. Here, we distinguish between this site and Whitewater Canyon, which is on the north side of the San Gorgonio Pass, draining the San Bernardino Mountains. We tended to cover Snow Creek and Whitewater concurrently, as Taylor and Richardson did in 1908.

Here we summarize observations of the three gnatcatcher species in the area during those efforts, as well as more recent notable observations by both us and others.

CABAZON

On 16 October 2012, Clark encountered a California Gnatcatcher calling with its characteristic mew vocalization in wash vegetation southwest of Cabazon, about 600 m north of the mouth of Twin Pines Gorge (elevation 520 m, Figure 1, point A1). Several desert-associated shrubs occur here, including catclaw, silver cholla, and California jointfir (*Ephedra californica*).

Later that day, approximately 1100 m to the northwest of the mouth of Twin Pines Gorge, Clark found a pair of California Gnatcatchers on a slope dominated by coastal-associated shrubs, including California sagebrush (*Artemisia californica*) and deerweed (elevation 550 m, Figure 1, point A2, Figures 2–3). The male was calling repeatedly. The same day, Unitt and Hargrove found two apparent immature males about 500 m east of the mouth of the gorge (Figure 1, point A3).

We also found Black-tailed Gnatcatchers, not historically known from anywhere in the pass, repeatedly during our visits to the Cabazon area, with two pairs on 6 January 2010 (Unitt) and up to four per day in the second week of May 2011 (Hargrove). One male and one female Black-tailed Gnatcatcher were collected as vouchers at Cabazon on 6 January 2010 (SDNHM 52494 and 52495). We also found Blue-gray Gnatcatchers during each visit to Cabazon, but no more than one per day and only a single individual during our visit during the breeding season in May 2011.

In his field notes for 24 May 1908, Richardson described the Blue-gray

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FIGURE 2. Habitat of pair of California Gnatcatchers 5 km southwest of Cabazon, California, 16 October 2012, elevation 550 m. The vegetation at this location is dominated by California sagebrush (*Artemisia californica*). View looking south, upslope.

Photo by Kevin B. Clark



FIGURE 3. View looking east at the same location as Figure 2, 16 October 2012, elevation 550 m. The vegetation at this location is dominated by California sagebrush (*Artemisia californica*), and deerweed (*Acmispon glaber*).

Photo by Kevin B. Clark

Gnatcatcher as “abundant and in pairs” at Cabazon, found a nest containing four young in a “sagebrush,” and collected two specimens (MVZ 1742, 15476). Richardson described the California Gnatcatcher as “not very common” at Cabazon; he and Taylor collected two specimens there (MVZ 1743, 1744).

SNOW CREEK/WHITEWATER

On 4 December 2012, Hargrove heard a single diagnostic “mew” of the California Gnatcatcher near the base of the bajada, or alluvial fan, of Snow Creek (elevation 400 m) (Figure 1, point B). The habitat was dominated by brittlebush, catclaw, deerweed, and cholla.

We encountered both Black-tailed and Blue-gray Gnatcatchers during our visits to Snow Creek, with up to five Black-tailed Gnatcatchers on 11 December 2008 (Unitt), and up to five Blue-gray Gnatcatchers on 31 May 2010 (Hargrove). One Blue-gray Gnatcatcher was collected at Snow Creek as a voucher on 30 March 2010 (SDNHM 52551). We also observed migrating Blue-gray Gnatcatchers at Whitewater with up to 8 per day on 1 April 2010 (Unitt).

In 1908, Richardson and Taylor did not encounter any gnatcatchers at Snow Creek or Whitewater.

WHITEWATER CANYON

This site was not covered in 1908, but some of us have visited it for other surveys. On 6 December 2020, Myers found a pair of California Gnatcatchers in the Whitewater River bed near Red Dome, north of the Whitewater Preserve (Figure 1, point D). This sighting is the northeasternmost of the species in the San Gorgonio Pass area.

On 16 May 2023, Ritt encountered a pair of California Gnatcatchers building a nest in a brittlebush (*Encelia farinosa*) (Figures 4, 5, and 6) in a tributary to Cottonwood Canyon, north of Whitewater (elevation 700 m; Figure 1, point C). This is the same general area where Stephanie Stragier had photographed and recorded a California Gnatcatcher on 2 July 2019 (<https://ebird.org/checklist/S58544422>) and Caroline Poli had reported up to two pairs of California Gnatcatchers on 3 March 2023 (<https://ebird.org/checklist/S130089046>). On 23 May Ritt observed a female incubating, establishing what appears to be the easternmost record of this species nesting in California. Scrub within 20 m of the nest was dominated by brittlebush, interspersed with California sagebrush. Mature stands of California sagebrush were located along a wash 100 m southeast of the nesting site, and on multiple visits Ritt saw the pair frequently foraging in the densest and most mature patches of California sagebrush approximately 150–200 m to the southeast in the same wash.

Within the same watershed, Ritt found Black-tailed Gnatcatchers nesting 175 m and 250 m southeast of this California Gnatcatcher nest, and Blue-gray Gnatcatchers nesting 300 m southeast of this nest. Throughout the winter months, all three species of gnatcatchers foraged near each other within the denser vegetation of this wash.

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FIGURE 4. California Gnatcatcher nest in a brittlebush (*Encelia farinosa*) in a tributary to Cottonwood Canyon, north of Whitewater, California, 16 May 2023, elevation 700 m. Scrub within 20 m of the nest was dominated by brittlebush, interspersed with California sagebrush (*Artemisia californica*).

Photo by Steven M. Ritt

BANNING

In 2017 and 2018, Myers recorded the California Gnatcatcher repeatedly near a sand and gravel quarry. For instance, on 3 July 2017 he noted a pair foraging together, along with Black-tailed and Blue-gray gnatcatchers, in the dry wash of the San Gorgonio River. This location was approximately 200 m west of the Morongo Indian Reservation and immediately north of the quarry (Figure 1, point E). On 30 April 2018, he encountered a pair of California Gnatcatchers in coastal sage scrub on a south-facing slope above the riverbed in this area (elevation 760 m). The shrubs on this slope consist of California sagebrush, brittlebush, and California buckwheat (*Eriogonum fasciculatum*). Myers observed the male on this slope on 24 May, 18 June, and 11 July 2018 as well. Black-tailed Gnatcatchers were also frequently seen during surveys of this area from 2017 through 2019, and also apparently nested in the area.

A record in the California Natural Diversity Database (CNDDB FID#59418) by Nathan Moorhatch describes a pair of California Gnatcatchers observed on 19 January 2016 “just e of Banning Airport airstrip & just n of Smith Creek” (Figure 1, point F). The habitat here is described as non-native grassland interspersed with patches of catclaw. Smith Creek flows into the San Gorgonio River just east of this location.

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FIGURE 5. View from a farther distance of the same California Gnatcatcher nest as in Figure 4 in a brittlebush (*Encelia farinosa*) on 16 May 2023, elevation 700 m. Scrub within 20 m of the nest was dominated by brittlebush, interspersed with California sagebrush (*Artemisia californica*).

Photo by Steven M. Ritt

During our Grinnell Resurvey visits to Banning, Unitt found one Black-tailed Gnatcatcher pair 4 km east of Banning on 18 December 2013, and Hargrove found migrating Blue-gray Gnatcatchers, with up to 3 per day on 4 March 2010, but we found no gnatcatchers of any species during our visits in June or July. We detected no California Gnatcatchers on any visit.

In 1908 Richardson and Taylor saw few gnatcatchers at Banning but found at least one Blue-gray Gnatcatcher on 12 June and California Gnatcatchers on 11 and 15 June.

From 1991 through 2025, several other observations of the California Gnatcatcher have been posted to eBird.org and iNaturalist.org from Cabazon to Beaumont. Black-tailed Gnatcatchers have been reported as far west as Banning, and Blue-gray Gnatcatchers from throughout the region.

DISCUSSION

In addition to being a major corridor of migration, the San Gorgonio Pass is the most significant faunal interchange zone in southern California, connecting low-elevation desert and coastal scrub habitats and their associated species along a gradual elevational gradient. As climate patterns shift, this pass will become even more important as species seek out refugia, or expand or contract their ranges in response to increased warming.

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FIGURE 6. Habitat surrounding the California Gnatcatcher nest shown in Figures 4 and 5, in a tributary to Cottonwood Canyon, north of Whitewater, California, 16 May 2023, elevation 700 m. The red arrow indicates the nest's location in a brittlebush (*Encelia farinosa*).

Photo by Steven M. Ritt

Despite its importance for species movement and the documented rare and endangered species in the area, the San Gorgonio Pass has received relatively scant attention with respect to conservation. The pass essentially lacks any natural preserves or other habitat-conservation areas, and it has been subject to piecemeal development and land clearing. On top of these threats, its history of frequent fires poses a threat to various species reliant on mature vegetation.

West of the San Gorgonio Pass, the combination of habitat loss due to development, coupled with wide-ranging and frequent fires, has apparently restricted the distribution of the California Gnatcatcher, resulting in large expanses of former habitat in western Riverside County being unoccupied (Hulton VanTassel et al. 2017). Our surveys from 2008 to 2012 on the west side of the San Jacinto Mountains at Hemet and Valle Vista, sites with robust populations in 1908, found very few individuals—no more than two per day along the wash of the San Jacinto River 0.6 to 3 km north-northeast of Valle Vista. Thus, the California Gnatcatcher's survival at the eastern end of its range in the San Gorgonio Pass represents an important area of population persistence in the face of range contractions in the region.

Atwood (1988:18), listing the known sites of sympatry between the California and Black-tailed gnatcatchers, cited the specimen of the California Gnatcatcher Grinnell collected 2 miles east of Palm Springs in 1904 (Grin-

nell 1904; MVZ 39293) but concluded that “no extensive contact zone has been documented in this region.” Two other specimens of the California Gnatcatcher have been collected near Palm Springs, however (by L. H. Miller in 1916, UCLA 37930; and by J. Mailliard and J. W. Mailliard in 1918, CAS 56641), as have many Black-tailed Gnatcatchers (GBIF 2026). Our documentation of the California Gnatcatcher’s persistence at Cabazon, and the Black-tailed Gnatcatcher’s expansion to the west in the same area, confirm this as a rare contact zone for the two species, adding to the one in the Aguanga area of southern Riverside County (Weaver 1998) and the one at San Felipe in Baja California (Hamilton and Howell 2002). In 1979 and 1980, even though they covered Cabazon and Snow Creek repeatedly, McKernan et al. (1984) did not record the Black-tailed Gnatcatcher west of the mouth of Blaisdell Canyon at the western extremity of the Coachella Valley, so we infer that its expansion west and upslope into the San Gorgonio Pass was more recent. Similar expansions of the Black-tailed Gnatcatcher upslope have been documented by recent surveys in Joshua Tree National Park and other locations in the Mojave Desert (Hargrove and Unitt pers. obs.). In Arizona, Corman and Wise-Gervais (2005) noted northward and upslope range expansion up the Verde River to Camp Verde since the 1960s. For the Black-tailed Gnatcatcher, Root (1988) defined a winter distributional limit based upon winter minimum temperatures, arguing that metabolic demands become too great in colder climates, limiting survivorship through the winter. Rising winter minimum temperatures (Riddell et al. 2021) may therefore be promoting northward and upslope expansions in the region.

For the California Gnatcatcher, Mock (1998) extended Root’s (1988) results on the basis of January mean minimum temperatures in the region, postulating that where January mean temperatures fall below 2.5° C, winter mortality from metabolic stress increases and the California Gnatcatcher cannot persist. According to data from the network of RAWS weather stations from 2011 to 2024, the January mean minimum temperature for Cabazon was 8° C (National Oceanic and Atmospheric Administration 2024), well above the threshold for the California Gnatcatcher’s survival.

The extent of habitat suitable for the California Gnatcatcher in the San Gorgonio Pass is relatively limited, in part because of the patchiness of stands of the California sagebrush, a preferred shrub for the species’ foraging in Camp Pendleton, California (Clark et al. 2023). Historically, much of the lower slopes of the San Jacinto Mountains on the south side of the pass was covered with dense chaparral, which transitioned at lower elevations into coastal sage scrub dominated by California sagebrush, and then alluvial wash vegetation at the flats, and finally desert scrub to the east (Grinnell and Swarth 1913). As stated by Grinnell and Swarth (p. 316), “[Cabazon] is about at the point where the Pacific flora and fauna gives place to desert species.” In recent decades, however, fires in the San Gorgonio Pass have been frequent and extensive, and include the Poppet Fire of 1968, the Cabazon Fire of 1977, the Banning Fire of 1983, a (second) Cabazon Fire of 1985, the Peach Fire of 1988, an unnamed fire in 1989, a (second) Peach Fire in 1995, the Seminole Fire of 1995, the Esperanza Fire of 2006, and the Silver Fire of 2013 (Anderson et al. 2021). The long-term persistence of scrub and chaparral vegetation in the face of such frequent fires is uncertain. In other regions of Riverside

County, frequent fires have contributed to conversion of scrub habitats to grasslands (Minnich and Dezzani 1998), habitats completely unsuitable to any of the gnatcatchers.

The San Gorgonio Pass is also the only location within the U.S. known to support the California Gnatcatcher outside of cismontane southern California, that is, in a watershed not leading to the Pacific Ocean. This California Gnatcatcher population inhabits habitat types distinct from the rest of its U.S. range: desert-edge scrub and wash vegetation also inhabited by the Black-tailed Gnatcatcher. Climate change is predicted to shift rainfall patterns in California, with increased heating and longer droughts reshaping vegetation patterns (Thorne et al. 2016). Therefore, conserving a population of the California Gnatcatcher at the northeastern edge of its range may allow for adaptations to selective pressures in a more arid landscape than the species currently inhabits elsewhere in the U.S.

The San Gorgonio Pass also supports several other birds of conservation concern. At least in the past LeConte's Thrasher (*Toxostoma lecontei*) occurred west to Banning (Gilman 1904, Swarth 2018) but may now be extirpated throughout the pass. The Least Bell's Vireo (*Vireo bellii pusillus*), which was historically common (Grinnell and Swarth 1913), and the Summer Tanager (*Piranga rubra*), a more recent colonist (Unitt 2008), occur in the few patches of riparian trees.

Rojas et al. (2022) analyzed southern California landscapes and found that portions of the San Gorgonio Pass could serve as potential refugia from various anthropogenic stressors, including climate change. The elevation gradients, interplay of desert and coastal climate regimes, and mosaic of habitats suggest the San Gorgonio Pass can play an important role in future conservation in the region, including for the California and Black-tailed Gnatcatchers.

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