Coastal California Gnatcatcher
(*Polioptila californica californica*)

5-Year Review:
Summary and Evaluation

Photo by the U.S. Fish and Wildlife Service

U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
Carlsbad, California

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5-YEAR REVIEW
Coastal California Gnatcatcher (*Polioptila californica californica*)

GENERAL INFORMATION

Species: Coastal California gnatcatcher (*Polioptila californica californica*), a bird subspecies
Date listed under the Endangered Species Act: March 30, 1993
Federal Register citation: Service 1993
Classification: Threatened
Recovery Plan: There is no recovery plan for this subspecies.
Recovery Priority Number: 9C
Critical Habitat Designation: December 19, 2007 (Service 2007)

BACKGROUND

Under the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.), the U.S. Fish and Wildlife Service (Service), referred to as "we" in this document, maintain lists of endangered and threatened wildlife and plant species (referred to as the List) in the Code of Federal Regulations (CFR) at 50 CFR 17.11 (for wildlife) and 17.12 (for plants). Section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years.

Most recent status review: Service 2020. Coastal California gnatcatcher (*Polioptila californica californica*) 5-Year Review: Summary and Evaluation. Prepared by the Carlsbad Fish and Wildlife Office, Carlsbad, California. 4 pp.

We initiated the previous status review for Coastal California gnatcatcher on February 10, 2020 (Service 2020). The review was finalized on June 2, 2020, and recommended no change in status.

Federal Register notice announcing this status review: On August 17, 2023, we published a Federal Register notice announcing initiation of the 5-year review of this species, and the opening of a 60-day period to receive information (Service 2023).

REVIEW ANALYSIS

Species Overview and Habitat: The coastal California gnatcatcher (*Polioptila californica californica*) is a small, insectivorous bird that occupies the coastal sage scrub habitat of southern California and northern Baja California, Mexico. It measures approximately 11 centimeters (cm) (4.5 inches) and weighs 6 grams (0.2 ounces). Recognized for its fragrant aroma and beauty, coastal sage scrub is a remarkably diverse plant community that is associated with more species of concern than any other ecosystem in California (Cleland *et al.* 2016, p. 429). This includes the coastal California gnatcatcher, which is an obligate species of coastal sage scrub habitat (Atwood 1993, p. 151).

ASSESSMENT

Information Acquired Since the Last Status Review

This 5-year review was conducted by the Service's Carlsbad Fish and Wildlife Office. Data for this review were solicited from the public and interested parties through a Federal Register notice announcing this review on August 17, 2023. We also contacted the Ventura Fish and Wildlife Office, United States Geological Survey (USGS), and San Diego Management and Monitoring Program (SDMMP) to request any data or information we should consider in our review. Additionally, we conducted a literature search and reviewed information in our files.

SUMMARY OF NEW INFORMATION SINCE 2020

Genetics

Additional genetic analysis has been completed since the previous 5-year review that assessed the rangewide genetic structure and subspecies differentiation in the California gnatcatcher and supports retaining the coastal California gnatcatcher as a distinct subspecies (Vandergast *et al*. 2022, pp. 1213–1214). Utilizing four approaches to test for subspecies distinctiveness, researchers found genomic support for two distinct groups with a genetic boundary at approximately the 32°N latitude (just north of Ensenada) (Vandergast *et al*. 2022, pp. 1210–1211). When testing for posterior probabilities of assignment, nearly all individuals (96 percent) sampled north of 32°N assigned to *Polioptila californica californica* with greater than 90 percent probability of assignment. South of this delineation, individuals were generally admixed, meaning almost none could be assigned to any one subspecies (Vandergast *et al*. 2022, pp. 1210–1211; Figure 1).

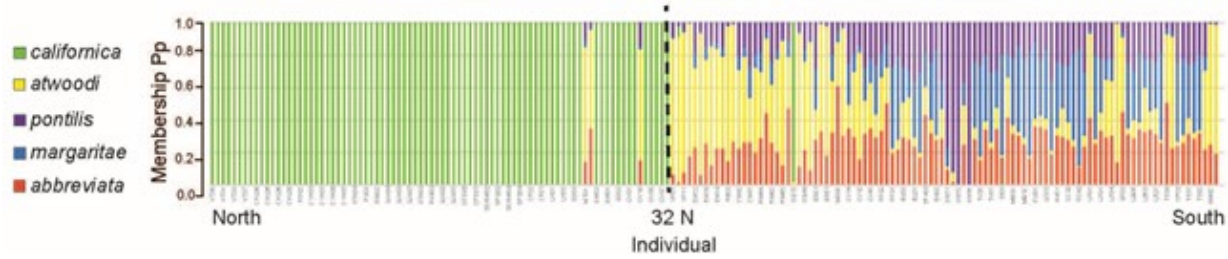

Figure 1. Discriminant Analysis of Principal Components (DAPC) posterior probabilities of assignments arranged from North to South with a dashed line at 32°N.[1]

Although the recent genomic study was not a taxonomic assessment, we continue to recognize the nominate subspecies, *Polioptila californica californica*, as a distinguishable taxon at the subspecies rank at this time. However, given the available information (Mellink and Rea 1994, entire; Vandergast *et al*. 2022, pp. 1210–1211), we conclude that it is more appropriate to consider the southernmost geographical limit to the subspecies' range to be about 32°N latitude, just north of Ensenada, Baja California.

[1] Almost all individuals north of 32°N were assigned with high probability (>0.9) to P. c. californica. Almost no individuals south of 32°N could be assigned with high probability to their respective subspecies (Figure and caption from Vandergast *et al.* 2022, p. 1212).

The researchers additionally assessed associations between climate variables and genetic variation to determine if climate-related selection pressure is driving genetic differentiation throughout the range. In general, Southern California experiences lower temperatures and higher precipitation than the Baja California Peninsula. In their assessment of climate-adapted loci, the researchers noted that the genotype of birds in the northernmost portion of the range (i.e., Ventura, Chino Hills, and Coyote Hills) appear to be associated with greater seasonal extremes of temperature and precipitation (Vandergast *et al*. 2022, pp. 1212–1213). The observed genetic differences may indicate an adaptive significance (Vandergast *et al*. 2022, p. 1213).

THREAT OF FRAGMENTATION

The coastal California gnatcatcher does not appear to be particularly sensitive to edge effects (changes in population or community structure at the boundary of two or more habitats) but rather to the effects of habitat degradation, which may be more concentrated at habitat edges (Bolger 2002, p. 149; Kristan *et al.* 2003, p. 42). Distance effects do not appear to have as large of an effect on gnatcatchers as previously believed, as supported by dispersal through urban areas where some habitat is available (Bailey and Mock 1998, p. 359). However, dispersal is more limiting where habitat (including small habitat patches) is lacking including near the 32°N latitude line.

In addition, recent genetic analysis has revealed genetic signatures indicating a high level of connectivity and gene flow throughout most of Southern California (Vandergast *et al.* 2019, p. 5). Exceptions to this are the northernmost areas in Ventura County, on the Palos Verdes Peninsula, and in the Coyote Hills (Vandergast *et al.* 2019, pp. 5–6) where habitat isolation is associated with reduced gene flow. Large distances between these occupied areas within which there is a low proportion of adjoining suitable habitat appears to separate these areas from the rest of the population in Southern California. Overall, the gnatcatcher remains largely connected throughout Southern California but emergent genetic structure among the northern areas suggests the gnatcatcher is likely to be sensitive to further increases in fragmentation and isolation of habitat within the northern portion of its range. In Baja California, genetic analysis of individuals throughout the peninsula revealed an admixture among the three subspecies residing there, indicating a high level of connectivity (Vandergast *et al.* 2022, pp. 1210–1211). A significant genetic break occurs between birds sampled north and south of the 32°N latitude line (Vandergast *et al.* 2022, pp. 1210–1211). This is likely at least partially due to the extensive urbanization in the Tijuana region restricting gnatcatcher movement.

Ongoing and anticipated implementation of regional NCCP/HCPs works to create a network of core-and-linkage habitat areas, thereby preventing or reducing the effects of future habitat fragmentation for much of the coastal California gnatcatcher range in Southern California. The core areas are large, mostly un-fragmented areas, while conserved habitat linkage areas are intended to provide continuous or ‘‘stepping-stone’’ corridors for coastal California gnatcatcher movement and dispersal. Thus, the ability of the coastal California gnatcatcher to move between and recolonize habitat areas within Southern California, including the existing preserve-and-linkage areas, helps to reduce some of the effects associated with habitat fragmentation, although connectivity appears to be somewhat limited within the larger Los Angeles metropolitan area

outside the boundaries of the adopted subregional multi-species conservation plans. This indicates that fragmentation at the rangewide scale is currently a threat of lower magnitude than initially believed at listing; however, fragmentation remains a significant threat in portions of the range that have become widely separated and geographically isolated (e.g., in Ventura County, on the Palos Verdes Peninsula, and in the Coyote Hills in northern Orange County).

THREAT OF WILDLAND FIRE

Wildland fire has been and remains an ongoing threat to the gnatcatcher and its habitat. Over the past 40 years, 43 percent of suitable gnatcatcher habitat has burned at least once and future projections predict a continuation to an increase in future fire risk. By consuming vegetation that is needed to support the feeding, breeding, and sheltering activities of gnatcatchers, fire temporarily reduces the carrying capacity of habitat capable of supporting gnatcatchers while the vegetation recovers, with studies suggesting it may take decades for gnatcatcher habitat occupancy rates to recover to pre-fire levels. Documented increases in fire frequency are also increasing the risk of vegetation type conversion. In combination, cumulative impacts from wildland fire and subsequent vegetation type conversion creates a positive feedback loop that promotes the degradation and eventual loss of coastal sage scrub habitat. Therefore, wildland fire and vegetation type conversion remain a high-level threat throughout the range of the subspecies. In addition to promoting the conditions that promote increased fire, anticipated effects of climate change also include increased drought, greater precipitation volatility, and increasing temperatures. These effects may have impacts on food availability (decreased arthropod abundance during drought), gnatcatcher reproduction and survivorship, and a shift in coastal sage scrub presence eastward and upslope.

CONCLUSION

Recent genetic work supported recognition of *Polioptila californica californica* as a separate subspecies, clarifying past questions of its taxonomic status. Therefore, we consider the coastal California gnatcatcher's range extends from Ventura County, California, south to approximately Ensenada, Baja California, Mexico at about 32°N latitude (Mellink and Rea 1994, entire; Vandergast *et al.* 2022, pp. 1210–1211).

The impacts of climate change are projected to promote an increase in fire frequency and intensity—further promoting the wildland fire-vegetation type conversion feedback loop described above. With regards to threats, fragmentation—once considered a higher-level threat—is now considered to be a lower magnitude threat than initially believed at listing, particularly in the southern portion of the subspecies U.S. range where NCCP/HCPs have provided for conservation in a "core and linkage" configuration. However, fragmentation remains a higher-level threat in the northern, isolated portions of the range where largescale conservation is not occurring, and data indicates there has been a loss of genetic connectivity with birds to the south. The predominant threats affecting the coastal California gnatcatcher include urban and agricultural development, grazing, wildland fire, vegetation type conversion, climate change, disease, predation, fragmentation, and brood parasitism. Grazing, disease, predation, and brood

parasitism are having local, small-scale impacts to the gnatcatcher; therefore, we do not consider them to be major threats.

After reviewing the best available scientific information, we conclude that the coastal California gnatcatcher remains a threatened species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our 2020 status review remains an accurate reflection of the species current status. Therefore, we conclude that coastal California gnatcatcher remains a federally threatened subspecies and recommend no change in listing status.

RECOMMENDATIONS FOR FUTURE ACTIONS

Successful implementation of the actions below will reduce threats to the coastal California gnatcatcher and provide information to better understand the biological and physical factors limiting the population growth and distribution. We recognize that conservation of this taxon will require cooperation and coordination with partners to minimize impacts from current threats and aid with future restoration efforts.

1. Identify and conserve areas to support coastal California gnatcatcher in a changing environment where potential range shifts may occur due to climate change.
2. Identify, prioritize, and protect coastal California gnatcatcher habitat available for acquisition.
3. Conduct rangewide surveys.
4. Research and develop techniques for coastal sage scrub restoration as part of an active management plan.
5. Monitor for and conduct brown-headed cowbird trapping where necessary to minimize impacts to the coastal California gnatcatcher.

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FIELD OFFICE APPROVAL

Lead Field Supervisor, Fish and Wildlife Service

☒ Approved

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