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**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**[Docket No. FWS–R8–ES–2014–0058; FXES11130900000C2–167–FF09E42000]**

# Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to Delist the Coastal California Gnatcatcher

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of 12-month petition finding.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to remove the coastal California gnatcatcher (*Polioptila californica californica*) from the Federal List of Endangered and Threatened Wildlife (List) under the Endangered Species Act of 1973, as amended. After review of the best available scientific and commercial information, we find that delisting the coastal California gnatcatcher is not warranted at this time.

**DATES:** The finding announced in this document was made on [INSERT DATE OF FEDERAL REGISTER PUBLICATION].

**ADDRESSES:** This finding, as well as supporting documentation we used in preparing this finding, is available on the Internet at *http://www.regulations.gov* at Docket Number FWS–R8–ES–2014–0058. Supporting documentation we used in preparing this finding will also be available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, 2177 Salk

Avenue, Suite 250, Carlsbad, CA 92008. Please submit any new information, materials, comments, or questions concerning this finding to the above address.

**FOR FURTHER INFORMATION CONTACT:** G. Mendel Stewart, Field Supervisor, Carlsbad Fish and Wildlife Office, 2177 Salk Avenue, Suite 250, Carlsbad, CA, 92008; by telephone at 760–431–9440; or by facsimile at 760–431–5901. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800–877–8339.

**SUPPLEMENTARY INFORMATION:**

**Background**

Under the Endangered Species Act of 1973, as amended (ESA or Act; 16 U.S.C. 1531 *et seq.*), we administer the Federal Lists of Endangered and Threatened Wildlife and Plants, which are set forth in title 50 of the Code of Federal Regulations in part 17 (50 CFR 17.11 and 17.12). Under section 4(b)(3)(B) of the Act, for any petition that we receive to revise either List by adding, removing, or reclassifying a species, we must make a finding within 12 months of the date of receipt if the petition contains substantial scientific or commercial information supporting the requested action. In this finding, we will determine that the petitioned action is: (1) Not warranted; (2) warranted; or (3) warranted, but the immediate proposal of a regulation is precluded by other pending proposals to determine whether any species are endangered species or threatened species and expeditious progress is being made to add or remove qualified species from the Lists. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring a subsequent finding to be made within 12 months. We must publish these 12-month findings in the **Federal Register**.

*Previous Federal Actions*

Since the coastal California gnatcatcher was first identified as a category 2 candidate species in 1982, it has been the subject of numerous **Federal Register** publications. We published a final rule to list *Polioptila californica californica* as a threatened species under the Act on March 30, 1993 (58 FR 16742), and we affirmed that determination in 1995 (60 FR 15693; March 27, 1995). Critical habitat for the subspecies was first established via a final rule that published on October 24, 2000 (65 FR 63680), and a revised final critical habitat rule was published on December 19, 2007 (72 FR 72010). The most recent Federal action prior to 2014 was our 2011 90-day finding on a petition to delist the coastal California gnatcatcher (76 FR 66255; October 26, 2011). We concluded at that time that the petition did not present substantial scientific or commercial information to indicate that delisting the coastal California gnatcatcher may be warranted (76 FR 66255; October 26, 2011). A summary of all previous Federal actions can be found at *http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08X*.

*Species Information*

The coastal California gnatcatcher (*Polioptila californica californica*) is a member of the avian family Polioptilidae (Chesser *et al.* 2010, p. 736). The bird's plumage is dark blue-gray above and grayish-white below. The tail is mostly black above and below. The male has a distinctive black cap, which is absent during the winter. Both sexes have a distinctive white eye-ring. This subspecies occurs primarily in or near vegetation categorized as coastal scrub, including coastal sage scrub. This vegetation is typified by low (less than 3 feet (ft) (1 meter (m)), shrub, and sub-shrub species that are often drought-deciduous (O'Leary 1990, p. 24; Holland and Keil 1995, p. 163; Rubinoff 2001, p. 1,376). Within the United States, the subspecies is restricted to coastal southern California from Ventura and San Bernardino Counties, south to the Mexican border. Within Mexico, its range extends from the U.S.–Mexico border into coastal Baja California south to approximately El Rosario, Mexico, at about 30 degrees north latitude (Grinnell 1926, p. 499; AOU 1957, p. 451; Miller *et al*. 1957, p. 204; Atwood 1991, p. 127; Phillips 1991, pp. 25–26; Atwood and Bontrager 2001, p. 3).

In our 2010 5-year review, we reported an estimate of 1,324 gnatcatcher pairs over an 111,006-acre (ac) (44,923-hectare (ha)) area on lands owned by city, county, State, and Federal agencies (public and quasi-public lands) of Orange and San Diego Counties (Service 2010, p. 8). We indicated that this study sampled only a portion of the U.S. range of the subspecies (the coastal regions), and that it was limited to 1 year (Winchell and Doherty 2008, p. 1,324). Standardized, rangewide population trends and occupancy estimates for the coastal California gnatcatcher (within the United States or Mexico) are not available at this time given the limited and incomplete survey information as well as the variability in the survey methods and reporting.

Since the publication of the 2010 5-year review, we have received the following results from limited surveys of the coastal California gnatcatcher within the U.S. portion of the range:

(1) 25 nests (with 11 successes out of 29 nesting attempts) within the Western Riverside County Multi-Species Habitat Conservation Plan (Western Riverside County

MSHCP) for the year 2014 in eight of the plan’s designated core areas (Biological Monitoring Program 2015, p. 8);

(2) 122 pairs and 33 single males (155 territories) within the City of Carlsbad (under the San Diego County Multiple Habitat Conservation Plan (San Diego County MHCP) in 2013, an increase of 28 territories from 2010 despite little change in survey area (City of Carlsbad 2013, p. 2);

(3) for Orange County, 12.7 percent occupancy within the Central Reserve and 34.3 percent occupancy in the Coastal Reserve (plus 17 other incidental observations) (Leatherman Bioconsulting 2012, p. 5); and

(4) 436 occupied sites for the coastal California gnatcatcher on Marine Corps Base Camp Pendleton (Camp Pendleton) (San Diego County) in 2014, including 122 territorial males, 283 pairs, and 31 family groups, with an additional 53 transient individuals identified (Tetra Tech 2015, p. ii).

We will continue to work with our partners to gather data on coastal California gnatcatcher populations and trends.

Since listing, we have updated information regarding the range of the subspecies. In our 2010 5-year review (Service 2010, pp. 6, 8; Table 1), we presented our estimate of the existing range of the coastal California gnatcatcher at that time. We also updated the extent of the subspecies’ range in Baja California, Mexico, using the coastal sage scrub vegetation map prepared by Rebman and Roberts (2012, p. 22) and observations of California gnatcatchers (all subspecies of *Polioptila californica*) (in Baja California (www.ebird.org; accessed December 15, 2015). This information is combined in the range map shown in Figure 1. We currently estimate 56 percent of the range is in the United States and 44 percent of the range is in Baja California, Mexico.

For additional information on the general biology and life history of the coastal California gnatcatcher, please see our most recent 5-year status review (Service 2010), available at the following websites: *http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08X* and *http://www.fws.gov/carlsbad/*.

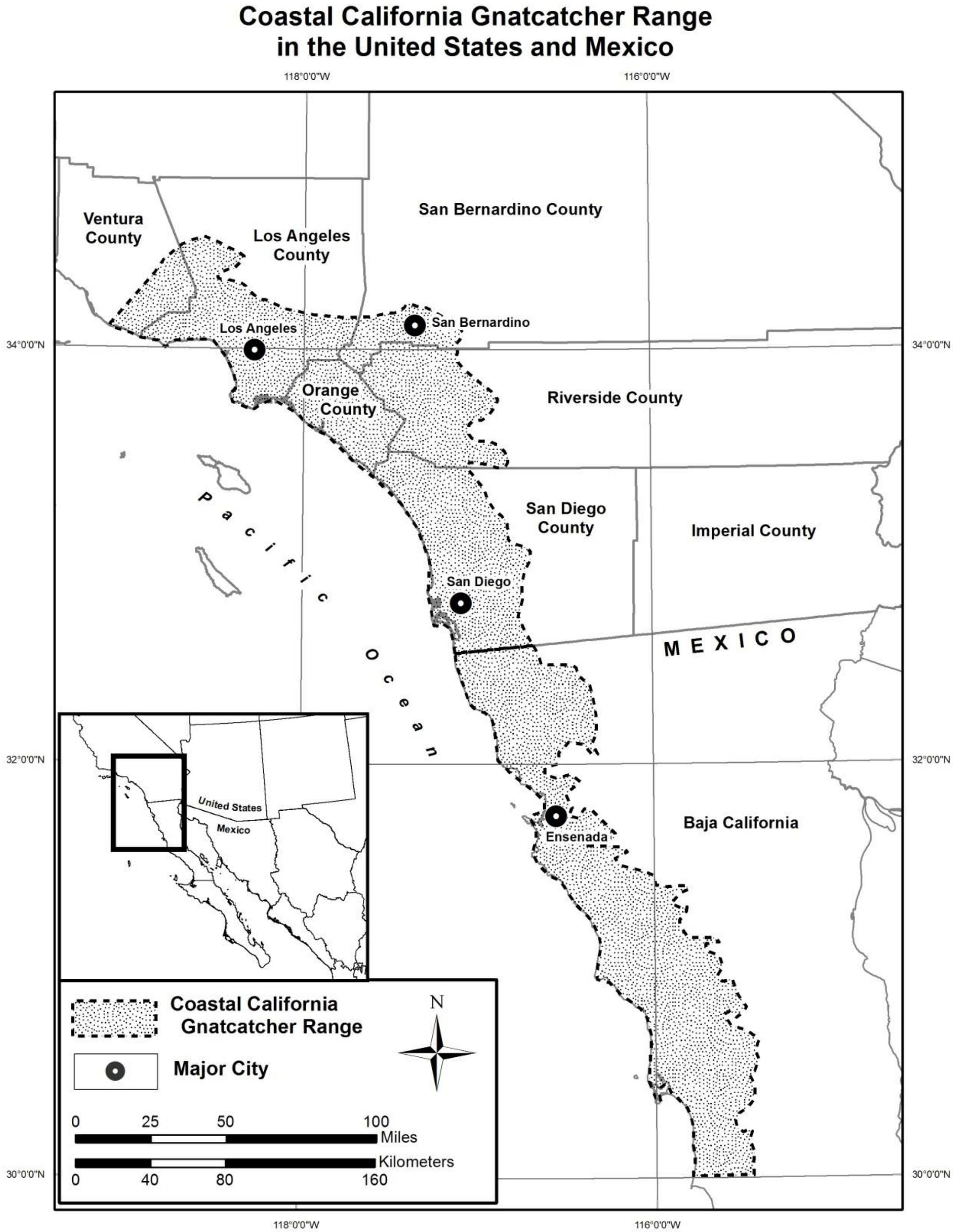


Figure 1—Current range of the coastal California gnatcatcher, based on information from our 2010 5-year review (Service 2010, pp. 6, 8; Table 1), the coastal sage scrub vegetation map prepared by Rebman and Riley (2012, p. 22), and observations of California gnatcatchers reported in Baja California, Mexico (www.ebird.org; accessed December 15, 2015).

*Petition History*

On May 29, 2014, we received a combined petition from the Center for Environmental Science, Accuracy, and Reliability; Coalition of Labor, Agriculture and Business; Property Owners Association of Riverside County; National Association of Home Builders; and the California Building Industry Association (collectively, petitioners), requesting that the coastal California gnatcatcher be removed from the Federal List of Endangered and Threatened Wildlife (List) under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioners, as required in 50 CFR 424.14(a).

The factors for listing, delisting, or reclassifying species are described at 50 CFR 424.11. We may delist a species only if the best scientific and commercial data available substantiate that it is neither endangered nor threatened. Delisting may be warranted as a result of: (1) Extinction; (2) recovery; or (3) a determination that the original scientific data used at the time the species was listed, or interpretation of that data, were in error.

The petition did not assert that the coastal California gnatcatcher is extinct, nor do we have information in our files indicating that the coastal California gnatcatcher is extinct. The petition did not assert that the coastal California gnatcatcher has recovered and is no longer an endangered species or threatened species, nor do we have information in our files indicating the coastal California gnatcatcher has recovered (further detail on the status of the coastal California gnatcatcher is presented in the *Summary of the Five Factors* section below). The petition also did not contain any information regarding threats to the coastal California gnatcatcher.

The petition asserts that the original scientific data used at the time the species was classified were in error and that the best available scientific data show no support for the taxonomic recognition of the coastal California gnatcatcher as a distinguishable subspecies (Thornton and Schiff 2014, p. 1). The petition's assertions are primarily based on the results of genetic and ecological analyses published in Zink *et al.* (2013). The petition maintains that, based on this new information, the Service cannot continue to rely on morphological measurements to determine whether the coastal California gnatcatcher is a valid (distinguishable) subspecies (Thornton and Schiff 2014, pp. 31–32).

The petition asserts that the morphological information originally used to distinguish the subspecies is flawed, citing published and unpublished critiques, alternative analyses, and other interpretations of morphological characteristics of California gnatcatchers (Thornton and Schiff 2014, pp. 14–21). The petition also contends that available genetic data do not support the coastal California gnatcatcher as a distinguishable subspecies (Thornton and Schiff 2014, p. 28). As evidence, the petition cites two published scientific articles in particular, Zink *et al.* (2000) and Zink *et al*. (2013), which were included as part of the petition. The petition asserts that these two studies "constitute the best available scientific data" (Thornton and Schiff 2014, p. 28) regarding the subspecific status of the coastal California gnatcatcher.

The petition discusses the results of both Zink *et al.* (2000) and Zink *et al.* (2013). Zink *et al.* (2000) examined variation within the mitochondrial DNA (mtDNA) control region and three mtDNA genes of the California gnatcatcher species as a whole and concluded that the genetic information did not support recognition of infraspecific taxa (subspecies) in the California gnatcatcher, including the coastal California gnatcatcher subspecies (Thornton and Schiff 2014, pp. 20–23). The petition further asserts that the genetic analysis presented in Zink *et al.* (2013, entire), based on eight different nuclear markers or loci and a reduced data set from Zink *et al.* (2000, entire), did not identify geographic groupings that corresponded with any previously recognized subspecies (Thornton and Schiff 2014, p. 28). The petition states that the nuclear DNA analysis in Zink *et al.* (2013) is consistent with a conclusion that the range of the California gnatcatcher has recently expanded from southern Baja California and that the species “is not divisible into discrete, listable units” (Thornton and Schiff 2014, p. 29).

The petition also provides results from an ecological niche model from Zink *et al.* (2013, pp. 453–454). The study presented results from niche divergence models constructed for California gnatcatchers represented in mesic coastal sage scrub (“northern population”) versus southern populations. The petition asserts that the model results indicate that the two groups do not exhibit significant niche divergence if the backgrounds of each environment are taken into account; it further states that the results from the ecological niche model support the petition’s assertions that there is no valid taxonomic subdivision of the California gnatcatcher (Thornton and Schiff 2014, pp. 29–30). The petition concludes that the best available data indicate that the California gnatcatcher (the species as a whole) “is not divisible into discrete, listable units, but instead is a single historical entity throughout its geographic range” (Thornton and Schiff 2014, p. 32).

On December 31, 2014, we published in the **Federal Register** a 90-day finding (79 FR 78775) that the petition presented substantial information indicating that delisting may be warranted. With publication of the finding, we initiated a review of the status of the subspecies. We requested further information from the public on issues related to the coastal California gnatcatcher such as: taxonomy; biology; new morphological or genetic information; consideration of the coastal California gnatcatcher as a distinct population segment (DPS); and information on the methods, results, and conclusions of Zink *et al.* (2000; 2013). In our status review below, we first examine whether the coastal California gnatcatcher is a valid subspecies, and thus a "species" as defined in section 3 of the Act. According to section 3(16) of the Act, we may list any of three categories of vertebrate animals: A species, subspecies, or a distinct population segment of a vertebrate species of wildlife. We refer to each of these categories as a "listable entity." If we determine that there is a species, or "listable entity," for the purposes of the Act, our status review next evaluates whether the species meets the definitions of an "endangered species" or a "threatened species" because of any of the five listing factors established under section 4(a)(1) of the Act.

In response to our information request associated with the status review of the subspecies, we received more than 39,000 letters. Most responders submitted form letters that opposed delisting of the coastal California gnatcatcher. Some submitted additional reports and references for our consideration. New information submitted included survey and trend data for localized areas, information related to effectiveness of regulatory mechanisms, information on restoration efforts, and information on threats to the subspecies and its habitat in the United States and in Mexico.

Additionally, multiple parties submitted critical analyses of information presented in the petition and in Zink *et al.* (2013), including a then "in press" (prepublication) scientific paper that was subsequently published in the journal *The Auk: Ornithological*

*Advances* (McCormack and Maley 2015) that disputed the methods and results presented in Zink *et al.* (2013). We received several responses from members of the scientific community, many of which provided critiques of the methods and interpretations of Zink *et al.* (2013), including critiques of the statistical analyses of the information presented, the selection and number of loci used in the genetic analyses, the methods and interpretation of the niche model, and the conclusion by Zink *et al*. (2013) that a lack of detection of genetic structure necessarily meant a lack of taxonomic distinctiveness (Andersen 2015, pers. comm.; Cicero 2015, pers. comm.; Fallon 2015, pers. comm.; Patten 2015, pers. comm.). We also received reanalyses of the genetic data used by Zink *et al.* (2013) (Andersen 2015, pers. comm.; McCormack and Maley 2015).

One commenter expressed support for the petition's arguments and the conclusions reached by Zink *et al.* (2013) and dismissed the findings of McCormack and Maley (2015) (Ramey 2015, pers. comm.). We received two responses from Zink dated March 2, 2015, and June 8, 2015 (Zink 2015a, pers. comm.; Zink 2015b, pers. comm.), and we received a response from one of the petitioners dated March 2, 2015 (Thornton 2015, pers. comm.), that directly addressed the critiques submitted by many of the other responders. These additional responses and additional supporting materials are available on the Internet at *http://www.regulations.gov* at Docket Number FWS–R8–ES–2014–0058.

Given the diverse and conflicting information submitted by the public and members of the scientific community in response to our request for information (79 FR 78775; December 31, 2014), we convened a scientific review panel. Through a Science Advisory Services contract process, the Service contracted Amec Foster Wheeler

Infrastructure and Environment, Inc. (hereafter Amec Foster Wheeler) to assemble a panel of independent experts to provide individual input on the available data concerning the subspecies designation of the coastal California gnatcatcher. Amec Foster Wheeler selected six panelists in accordance with peer review and scientific integrity guidelines from the Office of Management and Budget's *Final Information Quality Bulletin* (OMB 2004). The selected panelists each had between 19 and 35 years of experience in their respective fields, which included avian conservation, conservation genetics, taxonomy, population genetics, and systematics. An experienced facilitator with expertise in genetics and genetic techniques was also selected by Amec Foster Wheeler to assist and guide the panelists in their discussions during a 2-day workshop. Additional details regarding the selection of the panelists and their qualifications are available in the Final Workshop Review Report for the California Gnatcatcher Facilitated Science Panel Workshop (hereafter "science panel report") (Amec 2015, pp. 2–3, and Appendix D). This report is available as a supporting document we used in preparing this finding on the Internet at *http://www.regulations.gov* at Docket Number FWS–R8–ES–2014–0058. Conflict of interest forms were submitted by each panelist. The Service was not involved in any portion of the selection process, nor were we aware of the panelists' identities prior to the workshop.

Prior to the workshop, the Service prepared a list of relevant literature and **Federal Register** documents related to the science and listing history of the coastal California gnatcatcher. The panelists requested that we provide summaries of the subspecies' listing history, taxonomy, the Service's listable entity and DPS policies, and a summary of public comments. All documents were relayed to the panelists through the

Amec Foster Wheeler Project Manager. A complete list of information and references provided is available in the workshop science panel report (Amec 2015, Appendix B).

The workshop was held at the Carlsbad Fish and Wildlife Office on August 17–18, 2015. The purpose of the workshop was to provide a forum for the panelists to review the summary documents provided and to discuss the issues relevant to the taxonomic and systematic issues for the subspecies (see workshop agenda in Amec 2015, p. A-1). During the contracting process, the Service developed a Statement of Work with five suggested questions that the panelists consider during the workshop regarding the taxonomy and systematics issues related to the coastal California gnatcatcher. These are provided in the Amec Foster Wheeler science panel report (Amec 2015, p. A-2). Service personnel did not participate in the workshop discussions or interact with the panelists, with the exception of a brief question-and-answer session on the second day when the panelists requested clarification related to previous Federal actions and Service policies (for example, the DPS policy).

In our Statement of Work, we indicated that the panelists (to be selected by Amec) would include avian genetic and taxonomic researchers as well as experts in avian phylogeographic studies. We also requested that the Contractor would have sufficient experience and understanding in the field of genetics in order to be able to lead and facilitate the discussion of the panelists. The proposal for the facilitated expert panel workshop submitted by Amec to the Service on May 5, 2015 (revised May 13, 2015), included a summary of the six panelists' experience (ranging from 19 to 35 years each) and general areas of expertise in the fields of molecular genetics, avian conservation genetics, avian systematics, conservation genetics, population genetics, and avian molecular genetics. One of the panelists selected by Amec was subsequently replaced due to a scheduling conflict. The proposal also included the qualifications of the facilitator and Amec's Project Manager. We received the panelists' individual curriculum vitae with the draft and final workshop reports. After reviewing the panelists' individual curriculum vitae, we confirmed the six panelists are qualified experts in the fields of molecular genetics, avian conservation genetics, avian systematics, conservation genetics, population genetics, and avian molecular genetics. The Project Manager also noted in Amec's proposal that several panelists had requested that their individual memoranda be presented in the final report without attribution. Although we did not have knowledge of the attribution of the individual memorandums to the six panelists, we determined that all panelists are subject matter experts qualified to evaluate the scientific information presented in the petition. Additional details about the workshop process and the panelist discussions are available in the science panel summary report (Amec 2015, pp. 5–7).

After the workshop, each panelist individually prepared a memorandum that addressed topics relevant to the scientific information presented in the petition (for example, Zink *et al*. 2013) and to the subspecific taxonomic status of the coastal California gnatcatcher. We discuss the key information from those memoranda in the following section. In discussing specific supporting information and other comments presented in the individual memoranda, we refer to the panelists and their memos by the numbers randomly assigned to them by Amec Foster Wheeler (Panelist 1, Panelist 2, etc.) or to the Amec Workshop Report page number (Amec 2015).

*Key Information From the Science Panel Memoranda*

The panelists were not asked to reach a consensus. However, all six panelists found that the arguments presented by Zink *et al.* (2000; 2013) were not convincing, and that the coastal California gnatcatcher is currently a valid (distinguishable) subspecies. Panelists made the following points:

- The criteria used to distinguish subspecies should include multiple lines of evidence, such as morphology, genetics, and ecology. As such, the use of phylogenetic criteria alone to distinguish (or fail to distinguish) the coastal California gnatcatcher as a subspecies is not appropriate.
- Patterns of differentiation should be applied based on proposed mechanisms of evolution and the geologic age at which those events occurred, and the appropriate tools must be applied to adequately test those hypotheses. Based on the biogeographic history of the region, the infraspecific divergence in the coastal California gnatcatcher is of recent origin (less than 12,000 years before present, see Zink *et al*. 2000, 2013); therefore, the subspecies is likely in the earliest stages of adaptive differentiation.
- Relatedly, the amount of divergence in a small number of neutral genetic markers (genes that are not subject to selective pressures and, therefore, change slowly over time through accumulation of random changes) is likely to be small and unlikely to demonstrate genetic differences between subspecies.
- The genetic analyses conducted by Zink *et al.* (2000, 2013) contain insufficient information to detect subspecies limits. The panelists stated that the methods of Zink *et al.* (2000; 2013) for analyzing the data were not appropriate for detecting

recent, infraspecific divergence, as likely occurred in the case of the coastal California gnatcatcher.

- Panelists generally concurred that genetic studies that examine neutral genetic markers should not overturn existing subspecies boundaries, especially when divergence is not detected.

Panelists provided detailed information on the limitations of the conclusions that can be made based on the analyses presented in Zink *et al*. (2013) and other currently available information. In addition, the panelists concluded that two prior peer reviews had addressed the morphological data on the coastal California gnatcatcher, and that there was no new information in the materials provided or in the petition regarding the morphology of the coastal California gnatcatcher. Several panelists also provided recommendations for additional analyses and areas of research for future taxonomic studies.

In late 2015, Zink *et al.* submitted to the Service what was then an in-press manuscript (Zink 2015c, pers. comm.) that was subsequently published in *The Auk: Ornithological Advances* in January 2016 (available electronically December 2015). The article (Zink *et al.* 2016) presented additional interpretation and analysis of the data and models from Zink *et al.* (2013). Zink *et al.* (2016) responded to the criticisms of McCormack and Maley (2015) and argued that: (1) Subspecies listed under the Act should have one major character that is distinct or diagnostic; (2) the choice of loci and statistical methods used by Zink *et al.* (2013) to analyze nuclear DNA were correct; and (3) interpretations of the niche analysis in Zink *et al.* (2013) are correct, and the California gnatcatcher overall has a wide ecological tolerance. Zink *et al.* (2016)

concluded that no evidence for genetic structure exists among California gnatcatchers, and thus that the coastal California gnatcatcher is not a valid subspecies. Because the in-press article was received after the science panel met in August 2015, the information presented in this paper was not available for review by panelists. However, the Service reviewed Zink *et al.* (2016) and took into consideration its interpretation of the best available data in weighing all the evidence, including the data and analyses provided by the panelists, in making a final determination. Additional information regarding our analysis of Zink *et al.* (2016) is provided in the *Listable Entity Determination* section below.

*Listable Entity Determination*

The petition asserts that the coastal California gnatcatcher should be delisted. Working within the framework of the regulations for making delisting determinations, as discussed above, the petition asserts that the original data we used in our recognition of the coastal California gnatcatcher as a subspecies, and thus a listable entity under the Act, were in error. In determining whether to recognize the coastal California gnatcatcher as a valid (distinguishable) subspecies, we must base our decision on the best available scientific and commercial data. Additionally, we must provide transparency in application of the Act's definition of species through careful review and analyses of all the relevant data. Under section 3 of the Act and our implementing regulations at 50 CFR 424.02, a "species" includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature. As such, a "species" under the Act may include any taxonomically defined species of fish, wildlife, or plant; any taxonomically defined subspecies of fish, wildlife, or plant; or any distinct population segment of any vertebrate species as determined by us per our Policy Regarding the Recognition of District Vertebrate Population Segments (61 FR 4721; February 7, 1996).

Our implementing regulations provide further guidance on determining whether a particular taxon or population is a species or subspecies for the purposes of the Act: "the Secretary shall rely on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group" (50 CFR 424.11). For each species, section 4(b)(1)(A) of the Act mandates that we use the best scientific and commercial data available for each individual species under consideration. Given the wide range of taxa and the multitude of situations and types of data that apply to species under review, the application of a single set of criteria that would be applicable to all taxa is not practical or useful. In addition, because of the wide variation in kinds of available data for a given circumstance, we do not assign a priority or weight to any particular type of data, but must consider it in the context of all the available data for a given species.

For purposes of being able to determine what is a listable entity under the Act, we must necessarily follow a more operational approach and evaluate and consider all available types of data, which may or may not include genetic information, to determine whether a taxon is a distinguishable species or subspecies. As a matter of practice, and in accordance with our regulations, in deciding which alternative taxonomic interpretations to recognize, the Service will rely on the professional judgment available within the Service and the scientific community to evaluate the most recent taxonomic studies and other relevant information available for the subject species. Therefore, we continue to make listing decisions based solely on the basis of the best scientific and commercial data available for each species under consideration on a case-specific basis.

In making our determination whether we recognize the coastal California gnatcatcher as a distinguishable subspecies, and thus, whether the petitioned action is warranted, we will consider all available data that may inform the taxonomy of the coastal California gnatcatcher, such as ecology, morphology, genetics, and behavior. In particular, in this review, we focus on evaluating all new submitted and available data and analyses, including but not limited to the 2014 petition, the studies by Zink *et al.* (2000; 2013; 2016), McCormack and Maley (2015), and the science panel report (Amec 2015, entire) in the context of all the available data.

We do not address the petition's critiques or its citations to analyses and alternative interpretations of Atwood's morphological data (Thornton and Schiff 2014, pp. 14–21). In our 2011 90-day finding (76 FR 66255; October 26, 2011), we noted that on March 27, 1995, the Service published in the **Federal Register** (60 FR 15693) an extensive review of the Atwood data (including independent scientific analyses of the Atwood data) received during the public comment periods concerning the subspecies classification of the coastal California gnatcatcher. In that 1995 **Federal Register** document, we affirmed our earlier determination that the coastal California gnatcatcher is a valid subspecies (58 FR 16742, March 30, 1993; 58 FR 65088, December 10, 1993) and affirmed the coastal California gnatcatcher's threatened status under the Act. Thus, all of these critiques, analyses, and interpretations regarding Atwood's findings were previously considered by the Service in the 1995 listing determination and the 2011 petition decision. The 2014 petition provided no new information or analysis related to the morphological study of the coastal California gnatcatcher.

In our 2011 90-day finding (76 FR 66255; October 26, 2011), we provided a summary of our use of Atwood's morphological data as a part of a large suite of previous studies. We continue to consider those data to be part of the best scientific and commercial data available regarding taxonomy of the coastal California gnatcatcher. Furthermore, on September 15, 1995, the U.S. District Court for the District of Columbia dismissed with prejudice the lawsuit by the Building Industry Association of Southern California and other plaintiffs that sought to overturn the listing of the coastal California gnatcatcher. As part of that lawsuit, the court ordered the Service to release to the public the underlying data that formed the basis for Dr. Atwood's taxonomic conclusions. Given the court's 1995 ruling upholding the Service's recognition of the coastal California gnatcatcher as a valid subspecies, and the fact that no new data were presented by petitioners regarding morphological characteristics of California gnatcatchers, we do not further examine the petition's arguments about morphological data in this 12-month finding.

We also do not discuss the petition's assertions that because the Service has relied on mtDNA evidence in evaluating other species or subspecies for listing under the Act (Thornton and Schiff 2014, Exhibit D), we may not discount such information here. As discussed above, we base each listing decision on the best scientific and commercial data available for the individual species under consideration. Those data may or may not include results of genetic evaluations, including mtDNA analyses. Any data from genetic studies must be considered in the context of the suite of other relevant data available for a particular species. We previously considered the mtDNA data referenced in the petition along with other available information in our 2011 petition finding and concluded that the best available scientific and commercial information supports recognition of the coastal California gnatcatcher as a distinguishable subspecies.

As such, in this determination, we focus on the following topics: (1) defining subspecies criteria for the coastal California gnatcatcher; (2) interpretations of the results of analyses from genetic studies used in the petition; and (3) interpretations of the results of an ecological niche model used in the petition.

**Defining Subspecies Criteria for the Coastal California Gnatcatcher**

In determining whether to recognize the coastal California gnatcatcher as a distinguishable subspecies, we must first define the criteria used to make this decision given the available information. The petition notes that subspecies divisions are often arbitrary or subjective (Thornton and Schiff 2014, pp. 21–22). Indeed, within the ornithological and taxonomic literature, there are no universally agreed-upon criteria for delineating, defining, or diagnosing subspecies boundaries. Historically, multiple researchers (for example, Mayr (1943); Rand (1948); Amadon (1949)) proposed that at least 75 percent of the individuals of a subspecies should be separable from other populations by a particular characteristic. The American Ornithologists' Union (AOU) Committee on Classification and Nomenclature of North and Middle American Birds (formerly known as the Check-list Committee), the widely recognized scientific body responsible for standardizing avian taxonomy in North America (Haig *et al.* 2006, p. 1587), gives their standard definition of subspecies with guidance on interpreting criteria (AOU 2015, entire):

> Subspecies should represent geographically discrete breeding populations that are diagnosable from other populations on the basis of plumage and/or measurements, but are not yet reproductively isolated. Varying levels of diagnosability have been proposed for subspecies, typically ranging from at least 75 to 95 percent. Because subspecies represent relatively young points along an evolutionary time scale, genetic differentiation between subspecies may not necessarily parallel phenotypic divergence. Thus, subspecies that are phenotypically but not genetically distinct still warrant recognition if individuals can be assigned to a subspecies with a high degree of certainty.

In the scientific literature, multiple authors have provided definitions with a wide-ranging variety of criteria for defining or refining the taxonomic rank of subspecies for avian taxa (for example, McKitrick and Zink (1988); Amadon and Short (1992); Strickberger (2000); Helbig *et al.* (2002); Patten and Unitt (2002); Avise (2004); Zink (2004); Futuyma (2005); Cicero and Johnson (2006); Haig *et al*. (2006); Phillimore and Owens (2006); Rising (2007); Skalski *et al.* (2008); Fitzpatrick (2010); Haig and D'Elia (2010); Patten (2010); Remsen (2010); and Patten (2015)); however, there is no consensus in the literature for defining subspecies criteria for avian taxa (Sangster 2014, p. 212).

The science panelists who were convened to evaluate the taxonomy and systematics of the coastal California gnatcatcher provided their individual recommendations for criteria used to define subspecies as described in the scientific literature. Most of the panelists highlighted the AOU subspecies criteria as the standard for avian taxa (Amec 2015, Panelist 1, p. 101; Panelist 3, p. 111; Panelist 4, pp. 116–117; Panelist 5, p. 124; Panelist 6, p. 135). Panelist 2 provided the definition of subspecies from Haig *et al.* (2011), which states that, "subspecies is generally defined as a breeding population that has measurably distinguishable genotypes or phenotypes (or both) and occupies a distinct geographic area within its species range (Avise 2004, Patten 2010, Remsen 2010)." However, all panelists affirmed that multi-evidence criteria should be used for distinguishing the coastal California gnatcatcher as a subspecies.

The petition bases its argument for delisting on the genetic analyses presented in Zink *et al*. (2000) and Zink *et al*. (2013) and the results of the ecological niche model discussed in Zink *et al*. (2013). The conclusions drawn from these analyses are based on the authors' overall frame of reference that the "gnatcatcher populations and subspecies are not monophyletic" at either the geographic or taxonomic level of organization (Zink *et al*. 2016, p. 65), and that no monophyletic units are found within the gnatcatcher consistent with any "hierarchical Linnaean taxon" or any other unit based on the "traditional 75 percent rule" to define subspecies (Zink *et al*. 2016, p. 65). In other words, the petition relies on a cladistic classification approach, generally used for describing species rather than subspecies, and which is based entirely on monophyletic taxonomic groups (Mallet 2007, p. 1). This phylogenetic species concept also invokes the concept of reciprocal monophyly (exclusive coalescence), in which all individuals in a given group have a common ancestor not shared by any other group, and all individuals in that group should be genetically distinct and distinguishable from members of other populations.

However, the science panelists explicitly rejected the use of reciprocal monophyly for defining subspecies status for the coastal California gnatcatcher (Amec 2015, p. 105). Reciprocal monophyly is rarely used by avian taxonomists, even in defining taxa at the species level, and this approach is not shared by the majority of scientists (Amec 2015, pp. 126, 104; Sangster 2014, p. 208). Many scientists consider subspecies to be incipient species that are not yet fully reproductively isolated (Amec 2015, p. 126), and the subspecies of the California gnatcatcher have likely not been separated for sufficient time to display characteristics of reciprocal monophyly (Amec 2015, p. 106). Additionally, because there are a number of gene lineages contained within any population, if a population becomes geographically (or genetically) divided into two distinguishable entities, a significant amount of time is required before each of the branches will become "fixed for different, reciprocally monophyletic gene lineages at any single gene" (Mallet 2007, p. 7).

In evaluating the best available information regarding the taxonomic and systematic status of the coastal California gnatcatcher, we disagree with the petition's argument, and conclude that a multi-evidence criteria approach is most appropriate for distinguishing subspecies. In accordance with the science panelists and conclusions in the scientific literature (Sangster 2014; McCormack and Maley 2015), we do not accept that reciprocal monophyly is an appropriate criterion for distinguishing subspecies of avian taxa in the case of the coastal California gnatcatcher.

We next examine the available data regarding factors appropriate for evaluating the subspecific status for the coastal California gnatcatcher. As described above, we reviewed and summarized the available morphological data in detail in previous Federal actions, including the 2011 90-day finding (76 FR 66255; October 26, 2011). No new information regarding the morphological characteristics of California gnatcatchers was submitted in the petition or in response to our request for information in our 2014 90-day finding (79 FR 78775; December 31, 2014). Because there was no new morphological information or analyses to review, the panelists considered the previous peer reviews and summaries of morphological data to represent the best available information and relied on this information in their evaluations (Amec 2015, p. 4). In the following sections, we, therefore, focus our discussion on the genetic and ecological information presented in the petition to delist the coastal California gnatcatcher.

We note that our evaluation applies specifically to the coastal California gnatcatcher and not to avian subspecies in general. Each possible subspecies has been subject to unique evolutionary forces, different methods of selection will act on each subspecies (genetic drift versus allopatric speciation), and the potential divergence time (recent versus more distant) will, therefore, lead to different signals, particularly genetically; as such, the methods for detecting each will be different (Amec 2015, pp. 101–102).

*Analyses of Genetic Data Presented in the Petition*

The petition relies on the results of a nuclear DNA analysis presented by Zink *et al.* (2013) as evidence that delisting the coastal California gnatcatcher is warranted based on taxonomic error. As described above, this analysis examined eight nuclear loci and concluded that no genetic structure was apparent within California gnatcatchers. In other words, any differences in California gnatcatchers represent a geographic cline, and thus all differences occur gradually along a north-south gradient and do not represent sharp distinctions between unique groups. The petition states that Zink *et al.* (2013) provided the data and analysis requested by the Service in our 2011 90-day finding (76 FR 66255; October 26, 2011) (Thornton and Schiff 2014, p. 30) and the best available information supporting the assertion that the coastal California gnatcatcher is not a valid subspecies. It is true that we recognized in the 2011 petition finding that results from nuclear DNA analyses are likely to better detect genetic evidence of population differentiation than mtDNA data (76 FR 66258; October 26, 2011). However, we did not suggest that the results of nuclear DNA studies would or should be considered determinative of the coastal California gnatcatcher’s taxonomic status. Rather, we stated that future consideration of the status of the taxon “should wait for analyses of a variety of morphological, genetic (including nuclear and mtDNA) and behavioral evidence” (76 FR 66258; October 26, 2011). Consistent with our 2011 petition finding, we consider multi-evidence criteria involving multiple lines of genetic, morphological, and ecological scientific data to provide the best approach to determining the taxonomic status of the coastal California gnatcatcher.

With regard to the genetic evidence relied on in the current petition, multiple commenters from the scientific community and members of the science panel expressed concern regarding the nuclear DNA analysis and conclusions of Zink *et al.* (2013). Several panelists stated that Zink *et al.* (2013) chose markers with slow mutation rates that are inappropriate to evaluate the status of the coastal California gnatcatcher, given that their lineage diverged recently, likely within the last 12,000 years (for example, Panelist 6; Amec 2015, p. 147). For example, one science panelist stated that the loci chosen by Zink *et al.* (2013) do not in fact meet the standards recommended by the Service and the 2004 science panel, as described in the 2011 petition finding (76 FR 66255; October 26, 2011), given that loci with high mutation rates were requested (Amec 2015, p. 126).

We received information from the panelists and others from the scientific community (in response to our 90-day finding (79 FR 78775; December 31, 2014)) regarding the statistical methods presented in Zink *et al.* (2013). For example, Panelist 4 stated that the statistical analysis chosen for the nuclear loci genetic analysis (STRUCTURE) might be inappropriate because this method is not a statistically powerful approach for identifying genetic distinctions when divergence (genetic separation between two new groups) is modest, particularly given the small sample sizes used by Zink *et al.* (2013) (Amec 2015, p. 118).

We also received information regarding the approach and analysis of the nuclear markers used by Zink *et al*. (2013). Several commenters and members of the science panel found that McCormack and Maley's (2015) reanalysis of the data was more appropriate for considering subspecies than the original analysis by Zink *et al.* (2013). Additionally, several panelists found that the McCormack and Maley (2015) analysis did support an observed population structure in California gnatcatchers (Amec 2015, Panelist 2, p. 108; Panelist 4, p. 118; Panelist 5, p. 126). However, one panelist (Amec, pp. 145–146) criticized both Zink *et al.* (2013) and McCormack and Maley (2015) for having too small of a sample size to reach any conclusions from analysis of nuclear data. We acknowledge that the sample sizes for the studies are small; however, as previously discussed, we must rely upon the best available scientific and commercial data for making our conclusions; as such, we take both interpretations of the study into consideration in our analysis.

As previously noted, Zink *et al.* (2016) presented a rebuttal to many of the critiques raised by McCormack and Maley (2015); however, this article was not available when the science panel workshop was convened. Our review of the information presented indicates that Zink *et al.* (2016) do not provide substantial defense to the claims that the markers they selected were inappropriate for analyzing population structure of the coastal California gnatcatcher. Zink *et al.* (2016) state that these loci and the mtDNA used in Zink *et al.* (2000) have detected evolutionarily distinct lineages in other species along the same distribution of the coastal California gnatcatcher, such as the Le Conte's thrasher (*Toxostoma lecontei*), the curve-billed thrasher (*T. curvirostre*), and the canyon towhee (*Melozone fusca*). However, their comparison is not supported by documentation of any potential genetic, morphological, or ecological similarities between the coastal California gnatcatcher and these species that would provide a strong basis for their conclusion that unrelated species with different life histories and evolutionary histories might necessarily experience similar rates and patterns of genetic divergence.

Zink *et al.* (2016) also contend that the reanalysis of the data presented in McCormack and Maley (2015) is invalid because the data do not represent the original subspecies boundary as defined by Atwood (1988) at 28 °N. (Zink *et al.* (2016, p. 63) also perform a statistical analysis finding no structure in the population regardless of how it is divided). Still, we note that the range of the coastal California gnatcatcher subspecies as defined by the original listing in 1993 (58 FR 16742; March 30, 1993) is at 30 °N, and several reanalyses of the morphological data (Atwood 1991, entire; Banks and Gardner 1992, entire; Link and Pendleton 1994, entire) have supported the southern limit of the range of the subspecies to be at approximately 30 °N.

We reaffirm that the best available information indicates that the 30 °N is still the appropriate line to delineate the approximate southern limit of the subspecies' range, and, therefore, the genetic analyses based on that boundary are appropriate for considering the subspecific status. In support of this assessment, one science panel member also questioned the division of subspecies boundaries by Zink *et al.* (2013), stating that the presence of rare alleles north of the 30 °N boundary provides additional supporting scientific information that the coastal California gnatcatcher subspecies is valid. This panelist further noted that the choice by Zink *et al*. (2013) to use the 28 °N boundary does not answer the question as to whether genetic structure would have been detected if the accepted 30 °N latitudinal break was chosen (Amec 2015, p. 127). Zink *et al.* (2016, p. 61) dismiss the significant genetic structure observed in two loci in the reanalysis of McCormack and Maley (2015), stating that their statistical result "was driven by an excess of rare alleles as a result of larger sample sizes in the north. . . as well as by population expansion" (citing Zink *et al*. 2013). However, this assessment does not address the implication of rare alleles in the north, which, as noted by the science panelists and McCormack and Maley (2015), provides evidence of population structure. In fact, one panel member noted that the observation of rare alleles found in McCormack and Maley (2015) was especially significant given that the smaller population size in the north has been attributed to the presence of reported population declines or bottlenecks, which often remove rare alleles (Allendorf *et al*. 2013, p. 109) (Amec 2015, p. 127).

An additional difference in the views regarding the genetic analysis presented in Zink *et al*. (2013) relates to how scientists interpret negative results. The petition argues that a lack of structure detected means that such genetic or population structure is overall lacking. However, negative results (such as failure to detect structure) can be interpreted as either the true absence of genetic structure or as simply inconclusive. Several panelists stated that they found the results of Zink *et al.* (2013) to be inconclusive overall. In addition, one panel member noted that the methods used in Zink *et al.* (2013) might lack adequate statistical power to detect population structure, given that relatively few loci were used (Amec 2015, p. 125). This highlights the significance of the detection of structure by McCormack and Maley (2015, pp. 382–383), despite the small number of markers used.

We also received information from the science community and from the panelists regarding the use of only a small number of neutral genetic markers by Zink *et al*. (2013). Two panelists stated that the observed morphological difference between the northern and southern populations of California gnatcatchers is likely only caused by a very small portion of the genome (Santure *et al.* 2013, p. 3959; Poelstra *et al.* 2014, p. 1414; Amec 2015, pp. 113, 117). Thus, the chance of detecting that difference using few neutral genetic markers is very small. The apparent absence of species-wide genetic structure at a handful of neutral markers unconnected to phenotype does not necessarily indicate the absence of important adaptive differences among specific groups (Amec 2015, p. 118).

The petition contends that use of DNA data can result in more clear and decisive answers regarding subspecies limits than morphological characteristics (Thornton and Schiff 2014, p. 21). We concur with the petition's assertions and the panelists' summaries that genetic data can in some cases provide clear diagnostic information regarding the geographic limits of related populations, which can then be interpreted and applied in assessing taxonomic treatments. However, we also concur with the panelists that evaluation of genetic data must be thorough, analyzed using genetic markers appropriate for the time scale of likely divergence, and analyzed using appropriate statistical methods. We agree with the panelists that the number and type of genes tested by Zink *et al*. (2013) were insufficient, and that the analysis relied upon in the petition was too limited to “prove the negative”; that is, we do not agree with the assertion in the petition that the coastal California gnatcatcher subspecies is not valid based on analysis of DNA data and the original listing was in error. Rather, we conclude that the best available genetic information, including independent evaluations from the science panelists and reanalyses of data from members of the scientific community (for example, Andersen 2015, pers. comm.; McCormack and Maley 2015), indicates that there is some genetic evidence for population structure in the California gnatcatcher and that this evidence provides some support for the distinguishability of the coastal California gnatcatcher as a subspecies. As discussed above, we consider multi-evidence criteria involving multiple lines of genetic, morphological, and ecological scientific data to provide the best approach to determining the taxonomic status of the coastal California gnatcatcher.

One recommendation made by five of the six science panelists was that existing or any newly collected samples be reanalyzed using large numbers of genomic data (AMEC 2015, pp. 102, 109, 121–122, 131, 141), particularly, thousands to tens of thousands of single nucleotide polymorphisms (SNPs) that represent a large portion of the genome. On July 6, 2016, Zink sent to the Service an accepted abstract to be presented at the 2016 North American Ornithology Conference in August (Zink 2016b, pers. comm.). The abstract references a study in which Váquez-Miranda and Zink examine thousands of SNPs for the coastal California gnatcatcher and other Baja California bird species. The authors state that the study results show a lack of population structure in the coastal California gnatcatcher (Zink 2016b, pers. comm.).

The science panelists who recommended the use of SNPs included several provisos. They cautioned that the SNP dataset be analyzed using samples from individuals across the range of the California gnatcatcher species, appropriate hypothesis testing be used, appropriate statistical methods be used (for example, testing for outlier loci (Funk *et al.* 2012, p. 493)), and the data be released publicly to allow for transparency of analysis (AMEC 2015, pp. 104, 121, 131, 141, 151). If incorrect methodology is used, the SNP analysis will unlikely be able to identify adaptive divergent groups, particularly given that the vast majority of SNPs in any dataset will be neutral (Amec *et al.* 2015, p. 131; Funk *et al.* 2012, p. 492–494). As stated previously, given the recent genetic separation (divergence) of the coastal California gnatcatcher, adaptive divergence of its genomic structure (that is, those few key genes responding to local selection pressures) is likely represented in only a few SNP loci, which can be difficult to locate even within a large set of SNPs (Amec 2015, p. 121).

The underlying study identified by Zink (2016b, pers. comm.) has not been provided to us and has not been peer-reviewed or published. The abstract submitted by Zink (2016b, pers. comm.) did not include information regarding the sampling methods used in the study or the statistical methods used to analyze the samples. The division between subspecies of California gnatcatchers used by Váquez-Miranda and Zink appears to be located farther south than the recognized boundary for the subspecies at 30 °N, which may confound the results (Zink 2016b, pers. comm.). In sum, the submitted abstract does not provide sufficient detail and information to enable us to adequately evaluate its conclusions. Therefore, we do not consider the abstract to provide the best available information regarding the subspecific status of the gnatcatcher. We will consider the underlying study and data, along with all new information provided on the coastal California gnatcatcher, as we receive it.

*Ecological Niche Model*

The petition also relied on the results of an ecological niche model constructed by Zink *et al.* (2013). In general, an ecological niche model represents an estimation of the different niches (for example, existing, potential, occupied) and uses estimates of suitable conditions from observations of species' presence (Peterson *et al*. 2011, p. 271). The model is then constructed (usually with a specialized computer program) by overlaying that occurrence data with environmental data such as temperature, precipitation, elevation, vegetation type, or other habitat characteristics. The model then can be used for a variety of functions; for example, it can be used to predict an entity's occurrence elsewhere on the landscape or compare two populations or subspecies to determine similarities of occurrence, as was the case for Zink *et al.* (2013). The model constructed by Zink *et al.* (2013) compared temperature and precipitation data for habitats throughout the range of the California gnatcatcher species as a whole. The petition asserts, based on the results of the ecological niche model that, although California gnatcatchers in the northern portion of their range inhabit a distinctive coastal scrub habitat, no background environmental differences or climactic differences are present (Thornton and Schiff 2014, p. 30). Zink *et al.* (2013, p. 456) also stated that the results of their niche model indicate that California gnatcatchers overall exhibit broad ecological tolerance. The petition asserted that the lack of differentiation in the modeled niches is indicative of no evidence for subspecies divisions based on the variables included in the model.

In response to our request for information in our 90-day finding (79 FR 78775; December 31, 2014), we received differing interpretations of the ecological niche model from Zink *et al*. (2013). For example, McCormack and Maley (2015, p. 384) disagreed with the interpretation of the niche model results stating that the model results provided evidence of strong differentiation between the ecological niches of different populations of California gnatcatchers and that Zink *et al.* (2013) had improperly failed to reject their null hypothesis that the niches and background areas were equally divergent. We also received information from one member of the public who indicated that he was provided the opportunity to comment on a draft version of the Zink *et al*. (2013) paper and had identified "fundamental flaws" with the ecological niche model analysis that were not addressed in the final publication (Atwood 2015, pers. comm.).

The science panelists also disagreed with the interpretation of the results of the ecological niche model presented in Zink *et al*. (2013). One panelist cited the lack of clarity as to how the model results were interpreted, and the panelist concluded that the model results do show differences in the environments inhabited by the coastal California gnatcatcher and the other subspecies farther south, in support of the conclusions of McCormack and Maley (2015) (Amec 2015, p. 113).

The ecological niche model presented by Zink *et al.* (2013) was constructed using broad-scale bioclimatic variables. Two panelists stated that habitat variables such as vegetation type, structure, or composition should have been used for constructing the niche model since these variables incorporate a better ecological approach for distinguishing subspecies (Amec 2015, pp. 119, 148). In addition, our assessment of available vegetation maps from Mexico and documentation provided in the literature (for example, Rebman and Roberts 2012, p. 25) indicate that there is a clear distinction between plant communities in Baja California at about the 30° N latitude and, therefore, separate ecological niches; two panelists also emphasized the distinction between habitat types (Amec 2015, pp. 104, 129).

Further support for the interpretation of McCormack and Maley (2015) is provided in a new paper by Theimer *et al.* (2016). In that study, the researchers examined an ecological niche model performed by Zink (2015, pp. 79–82) for the southwestern willow flycatcher (*Empidonax traillii extimus*). From that model, Zink (2015, pp. 83–84) concluded that the southwestern willow flycatcher showed no ecological distinctiveness from other willow flycatchers. However, Theimer *et al.* (2016, pp. 292–293) reconstructed the Zink (2015) ecological niche model comparing the southwestern willow flycatcher and an unrelated species, the yellow warbler (*Setophaga petechia*), and found no ecological distinctiveness between the two species. In other words, the model was unable to predict any difference in niche (specific habitat) use between the two unrelated species. Theimer *et al.* (2016) state that the reason for this is the use of overly broad environmental data that may fail to detect ecological distinction on a finer scale, such as that which might be expected for subspecies or closely related species that would be expected to have some ecological characteristics in common. Theimer *et al.* (2016, p. 294) argued that ecological niche models needed to include other habitat characteristics beyond broad measures of temperature and precipitation that were used for both the southwestern willow flycatcher and the coastal California gnatcatcher (Zink *et al.* 2013; Zink 2015). The authors further concurred with McCormack and Maley (2015) that Zink *et al.* (2013) had improperly failed to reject the null hypothesis for their niche model (Theimer *et al.* 2016, p. 294).

In the Zink *et al.* (2016) article, published in response to the critique of Zink *et al*. (2013) by McCormack and Maley (2015), Zink *et al.* (2016, p. 63) defended their interpretation of the California gnatcatcher ecological niche model, stating that most widespread species occupy different climactic niches. They stated that the fact that one portion of the California gnatcatcher species population occupies mesic versus xeric habitat does not necessarily indicate that there are evolved niche differences (Zink *et al.* 2016, p. 63). Following the publication of the article by Theimer *et al.* (2016), which, as discussed above, presented a differing analysis and interpretation of the niche modeling results presented in Zink (2015) for the southwestern willow flycatcher, Zink submitted a draft copy of a scientific article to the Service on July 1, 2016, responding specifically to Theimer *et al.* (2016)'s critique (Zink 2016a, pers. comm.). In the draft article, Zink argues that the reanalysis by Theimer *et al.* (2016) only found weak partitioning between niches and that the Zink (2015) study used standard methodology for ecological niche models. However, the draft article does not address the larger concern raised by Theimer *et al.* (2016) that the environmental data used for the analyses presented in Zink (2015) for the southwestern willow flycatcher as well as our similar concern for the niche model results presented in Zink *et al*. (2013) for the coastal California gnatcatcher were too coarse to reliably detect differences in ecological niches. The best available information indicates that there is a difference in habitat used by the populations of the California gnatcatchers north of 30 °N latitude and the populations farther south, and this habitat difference is consistent with both observed morphological differences and the slight genetic variation (as described in *Analyses of Genetic Data Presented in the Petition* above) that occurs at the 30 °N latitude that has defined the southern limit of the range of the coastal California gnatcatcher since the time of listing. Therefore, we conclude that ecological differences help distinguish the coastal California gnatcatcher as a subspecies.

*Summary*

After careful review of the best available information including information presented in the petition, information submitted by the public, information provided by the science panelists, and all other available information, we find that the results of the genetic analyses and niche modeling presented in Zink *et al*. (2000; 2013; 2016) do not provide sufficient information to support the petition's assertion that the coastal California gnatcatcher is not a valid subspecies and was listed in error. While the analyses presented by Zink *et al*. (2013) provide additional information related to the genetic characteristics of the California gnatcatcher, there are significant concerns with the methods used and the interpretations of the results. We reject the petition's argument that subspecies listed under the Act should have one major character that is distinct or diagnostic. We concur with the input from the assessments provided by the science panelists and the information submitted by the scientific community and the public in response to our request for information, and our determination is based on all available data that may inform the taxonomy of the coastal California gnatcatcher. Multi-evidence criteria involving multiple lines of genetic, morphological, and ecological scientific data support our recognition of the coastal California gnatcatcher as a distinguishable subspecies. Therefore, we conclude that the best scientific and commercial information available indicate that the coastal California gnatcatcher is a distinguishable subspecies, and we continue to recognize it as a listable entity under the Act (that it is a "species" as defined in section 3 of the Act and is thus eligible to be listed as a threatened species or endangered species).

Having reviewed the best available information regarding the taxonomy of the coastal California gnatcatcher and determined it is a distinguishable subspecies, we next evaluate information regarding its appropriate status under the Act.

**Summary of Information Pertaining to the Five Factors**

Section 4 of the Act (16 U.S.C. 1533) and implementing regulations (50 CFR part 424) set forth procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, a species may be determined to be an endangered species or threatened species because of any of the following five factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

In making this finding, information pertaining to the coastal California gnatcatcher in relation to these five factors is discussed below. In considering what factors might constitute threats, we must look beyond the mere exposure of the species to the factor to determine whether the species responds to the factor in a way that causes actual impacts to the species. If there is exposure to a factor, but no response, or only a positive response, that factor is not a threat. If there is exposure and the species responds negatively, the factor may be a threat. We then attempt to determine if that factor rises to the level of a threat, meaning that it may drive or contribute to the risk of extinction of the species such that the species warrants listing as an endangered species or threatened species as those terms are defined by the Act. This does not necessarily require empirical proof of a threat. The combination of exposure and some corroborating evidence of how the species is likely impacted could suffice. The mere identification of factors that could impact a species negatively is not sufficient to compel a finding that listing is appropriate; we require evidence that these factors are operative threats that act on the species to the point that the species meets the definition of an endangered species or threatened species under the Act.

In 2010, we conducted a threats analysis in our 5-year review for the coastal California gnatcatcher (Service 2010, entire). The following analysis of factors affecting the species is a summary and update of the information presented in the 2010 analysis, which is incorporated by reference in this section. We updated the summary presented here, where appropriate, with new information from the literature or received from the public in response to our request for information in the 90-day finding (79 FR 78775; December 31, 2014). As described above in **Background**, the petitioners did not provide information on any of the factors. However, several respondents to our request did submit information regarding factors affecting the species. Our 2010 5-year review is available online at *http://www.regulations.gov* in Docket Number FWS–R8–ES–2014–0058 as a Supporting Document (ID: FWS–R8–ES–2011–0066–0003) and at our Environmental

Conservation Online System webpage *http://ecos.fws.gov/tess_public/profile/speciesProfile?spcode=B08X* or by request from the Carlsbad Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

The following sections include summary evaluations of nine potential threats to the coastal California gnatcatcher that we identified in the 2010 5-year review as having impacts on the subspecies or its habitat throughout its range in the United States and Mexico. Potential threats that may impact the subspecies are those actions that may affect individuals or habitat either currently or in the future, including habitat loss from urban and agricultural development (*Factor A*), grazing (*Factor A*), wildland fire (*Factor A* and *Factor E*), vegetation type conversion (*Factor A*), climate change (*Factor A* and *Factor E*), disease (*Factor C*), predation (*Factor C*), fragmentation (*Factor A* and *Factor E*), and brood parasitism (*Factor E*). We also evaluate the extent to which existing regulatory mechanisms (*Factor D*) may ameliorate threats associated with the other factors. We further note that potential impacts associated with overutilization (*Factor B*) were evaluated in the 2010 5-year review, but we concluded that this factor had low or no impacts, overall, across the subspecies' range (see Service 2010, p. 21). We did not receive any information that impacts associated with overutilization have changed since that time. Based on the best available scientific and commercial data, we have not identified any new threats to the coastal California gnatcatcher since the 2010 5-year review.

To provide a temporal component to our evaluation of threats, we first determined whether we had data available that would allow us to reasonably predict the likely future impact of each specific threat over time. Overall, we found that, for many threats, the likelihood and severity of future impacts became too uncertain to address beyond a 50-year timeframe. For example:

- The Natural Community Conservation Planning (NCCP) Act, in conjunction with the Service's Habitat Conservation Planning (HCP) process established under section 10(a)(1)B) of the Act has established long-term NCCP/HCPs within the U.S. range of the coastal California gnatcatcher. These plans address development impacts on the subspecies and its habitat for 50 to 75 years into the future, depending on the plan terms and conditions. We, therefore, consider 50 years a reasonable timeframe for considering future impacts.
- Laws governing urban development under State environmental laws, such as the California Environmental Quality Act and the NCCP Act, have remained largely unchanged since 1970 and 1991, respectively; thus, we consider existing regulatory mechanisms sufficiently stable to support a 25- to 50-year timeframe.
- In analyzing potential impacts from disease, predation, grazing, and brood parasitism, we considered all available information regarding any future changes that could alter the likelihood or extent of impacts. We had no such information extending beyond a 50-year timeframe.
- Although information exists regarding potential impacts from climate change beyond a 50-year timeframe, downscaled climate model projections for this region extend only to the 2060s.

Therefore, a timeframe of 50 years is used to provide the best balance of scope of impacts considered versus certainty of those impacts.

*Urban and Agricultural Development*

The largest impacts to coastal sage scrub in California, including within the range of the coastal California gnatcatcher, both past and present, have been due to the effects of urbanization and agriculture (Cleland *et al*. 2016, p. 439). Development for urban use involves clearing of existing vegetation. Urban development not only results in buildings, roads, and other infrastructure, which are permanent, but also includes "temporary" impacts, such as pipeline installation or heavy equipment activity adjacent to permanent urban development (Service 2010, p. 12). Without active habitat restoration actions, sites formerly supporting coastal sage scrub vegetation that have undergone severe disturbance (from heavy equipment and earth-moving activities) require decades to recover (Stylinski and Allen 1999, p. 550). At the time of listing, we reported that 58 to 61 percent of coastal sage scrub habitat had been lost in the three counties that supported about 99 percent of the coastal gnatcatcher population in the United States; we further identified urban and agricultural development as the primary cause for this loss of habitat (58 FR 16751; March 30, 1993).

Urban development has continued to occur throughout the range of the coastal California gnatcatcher, and in our 2010 5-year review we concluded that urban development was an ongoing threat to the subspecies (Service 2010, pp. 12–15; 21). For the purposes of this status review, we evaluated the current protection status of coastal sage scrub (the primary habitat type that supports the coastal California gnatcatcher) within the U.S. range of the subspecies using geospatial data from the U.S. Geological Survey. We note, however, that the distribution of the coastal California gnatcatcher within the United States is not necessarily the same as the distribution of coastal sage scrub vegetation, because not all coastal sage scrub is occupied by coastal California gnatcatchers at any given time (Winchell and Doherty 2014, entire). Our analysis for the U.S. portion of the range found that 16 percent of coastal sage scrub receives permanent protection and minimal human use; 35 percent is permanently protected from urban development but allows multiple uses including off-highway vehicle use or mining; and 49 percent has no assured protections preventing urban development (Service 2016a).

Currently, much of the subspecies' range in the United States, which includes coastal sage scrub as well as other habitat types and some partly developed areas, is included in completed NCCP/HCP plans where the coastal California gnatcatcher is a "covered species." Other NCCP/HCPs within the subspecies' range in the United States are in various stages of development, such as the North County Multiple Species Conservation Plan in north-central San Diego County, the Orange County Transportation Authority M2 NCCP/HCP, and the Rancho Palos Verdes NCCP/HCP in Los Angeles County. Within the northernmost portion of the subspecies' range in Los Angeles and Ventura Counties, the draft Rancho Palos Verdes NCCP/HCP is the only plan in development. Though the above list represents plans that are not yet permitted or fully implemented, specific conservation measures are included in these plans that provide protections for the subspecies and its habitat. Implementation of existing HCPs and the ongoing development of additional NCCP/HCPs have significantly reduced the impacts of urban development to coastal California gnatcatcher habitat in the United States by directing urban development away from some areas of coastal scrub vegetation while establishing habitat reserves that provide conservation benefits to the subspecies and other species. These plans are making substantial contributions to the conservation of the subspecies by creating a network of managed preserves with linked core habitat areas.

As reported in our 2010 5-year review, we estimated that 59 percent of suitable (modeled) coastal sage scrub habitat would be conserved with full implementation of four currently permitted NCCP/HCPs and one HCP (Service 2010, p. 15). For that analysis, modeled habitat consisted of coastal scrub vegetation within the U.S. portion of the range of the coastal California gnatcatcher as defined by reported observations, elevation, and coastal scrub vegetation (using CDF (2002) vegetation data). Using updated vegetation data (CDF 2015), we prepared a new geospatial analysis of the previously modeled coastal scrub habitat within the subspecies' range and within the planning-area boundaries of these NCCP/HCPs (as compared to the 2010 analysis that estimated acres of habitat expected to be conserved with full implementation). Based on our 2016 analysis, our revised estimate found that these plans encompass approximately 55 percent of the coastal sage scrub habitat within the U.S. range of the coastal California gnatcatcher (Service 2016a). We also evaluated the amount of land currently within conservation reserves established under these plans and estimated that approximately 47 percent of the plans' conservation targets have been reached (Service 2016a). This means that 28 percent of habitat in the U.S. portion of the coastal California gnatcatcher's range is currently conserved by NCCP/HCP plans.

Outside of the United States, urban development continues and is expected to continue into the future (Harper *et al*. 2011, p. 26; Meyer *et al*. 2016, pp. 10 and 13). Conservation of vegetation within the California floristic province of Baja California, Mexico, is receiving increasing attention (Meyer *et al*. 2016, p. 14). Two privately managed reserves were recently established in Baja California north of 30 °N latitude: (1) Punta Mazo in 2012, which consists of a portion of the tidal estuary and sand dune plant community at San Quintín Bay; and (2) La Reserva Natural Valle Tranquilo, purchased in 2006 and expanded in 2013, a 20,000-ac (9,094-ha) reserve south of San Quintín (Riley 2016, pers. comm.), which is at the very southern edge of the California floristic province found in Baja California, at the transition from coastal sage scrub/chaparral to desert plant communities (Meyer *et al*. 2016, pp. 12–13). Two Federal parks are also found in mountainous areas in northwestern Baja California. However, collectively, these four conservation areas encompass very little suitable California gnatcatcher habitat. No equivalent regulatory mechanisms to the NCCP/HCP process exist in Mexico. In that portion of the subspecies' range, Federal, State, and local laws provide limited protections to coastal California gnatcatcher habitat (see the *Existing Regulatory Mechanisms* section below).

In order to estimate the distribution of coastal sage scrub in northern Baja California, we created a digital map of the coastal sage scrub vegetation defined by and illustrated in Rebman and Roberts (2012, p. 22). Based on the digitized version of this published map, we created a boundary of the area in northern Baja California that contains coastal sage scrub vegetation; this acreage totaled approximately 1,862,413 ac (753,691 ha). We then prepared a coarse estimation of extant coastal sage scrub vegetation from our delineation of Rebman and Roberts (2012, p. 22) by removing those areas that have been converted to urban and agricultural development, as estimated from composite aerial images from ESRI World Imagery (2013). We estimated approximately 1,704,406 ac (689,749 ha) of coastal sage scrub habitat in northern Baja California, from

30° N to the United States-Mexico border (Service 2016a). This represents a difference of 158,007 ac (63,942 ha), or about 8.5 percent, from the map prepared by Rebman and Roberts (2012, p. 22) of their estimate of coastal sage scrub vegetation. Though this figure represents a rough estimate of coastal sage scrub vegetation in northern Baja California as of 2013, it is the only available analysis of change in amount of coastal sage scrub habitat available to us at this time.

In our 2010 5-year review, we indicated that the threats to the coastal California gnatcatcher as a result of agricultural development have been tempered in recent years by implementation of regulatory mechanisms, especially the State of California's NCCP process and the Federal HCP process (Service 2010, p. 14). We also indicated that the rate of loss of coastal California gnatcatcher habitat due to agricultural development has declined in its southern California range. More specifically, 1890–1930 was an intensive agricultural period in California with the expansion of dry land farming as well as rapid growth of intensively irrigated fruit and vegetable crops (Preston *et al*. 2012, p. 282). An unknown amount of coastal sage scrub within the U.S. range of the coastal California gnatcatcher was lost or modified during this time period.

The post-World War II population boom resulted in the conversion of many large agricultural areas to urban and suburban developments in southern California (Preston *et al*. p. 282). We used data from the Farmland Mapping and Monitoring Program (FMMP) of the Division of Land Resource Protection in the California Department of Conservation (CDC) to evaluate land use changes in California since 1984 (CDC 2016). Although not all areas of some counties have been inventoried, a review of these data for San Diego, Orange, Los Angeles, and Riverside Counties indicate net losses in prime farmland, from 1984 to 2012, of 8,508 ac (3,443 ha), 16,874 ac (6,829 ha), 12,326 ac (4,988 ha), and 82,611 ac (33,431 ha) (CDC 2016), respectively, for a total net loss of 120,319 ac (48,691 ha). Correspondingly, the reported net gains in urban and built-up land for the same time period and the same counties were 107,988 ac (43,701 ha), 59,264 ac (23,983 ha), 53,113 ac (21,494 ha), and 161,615 ac (65,403 ha) (CDC 2016), respectively, for a total net increase of 381,980 ac (154,582 ha). These numbers indicate that, although agricultural activities have declined in southern California, these former farmlands have likely transitioned to urbanized areas rather than been allowed to revert to or been restored as native habitats.

Because of the limited regulatory mechanisms in Mexico (see *Existing Regulatory Mechanisms* section below), agricultural activity continues to be a stressor within the subspecies' range in that country as a result of land clearing for both agriculture and grazing practices, particularly in northwestern Baja California (for example, Harper *et al*. 2011, pp. 28 and 31; Meyer *et al*. 2016, p. 10). These effects are likely to continue into the future.

In summary, urban development was identified as a threat at the time of listing and as an ongoing threat in our 2010 5-year review. Our 2016 evaluation of conserved lands established within the U.S. range of the subspecies indicates that approximately 55 percent of suitable coastal California gnatcatcher habitat is targeted for conservation by five regional NCCPs/HCPs, and that 47 percent of that goal has been achieved. Although the impact of urban development has been curtailed in NCCP/HCP planning areas and has decreased since the time of listing, conservation of the subspecies and its habitat within the plan areas is not expected until current conservation plans are more fully implemented and future conservation plans are approved and permitted in other portions of the subspecies' range. Suitable habitat that is not yet conserved may be subject to urban development or other stressors. Furthermore, although lands within conserved areas are not at risk of destruction or modification from development, other threats, as discussed below, remain. Additionally, some areas of suitable habitat would remain outside areas targeted for conservation and could be developed or impacted in the future. Therefore, urban development continues to result in the destruction, modification, or curtailment of the coastal California gnatcatcher's habitat, and represents a current, medium-level stressor to the coastal California gnatcatcher across its range in the United States and Mexico that has the potential to result in the loss of gnatcatchers at the population level and the loss of large but isolated patches of habitat. This stressor will continue to impact the subspecies and its habitat into the future.

The impacts to the subspecies related to agricultural development is low in the United States, but our recent evaluation of remaining coastal sage scrub habitat in Baja California indicates that agricultural development remains as a medium- to high-level stressor for the subspecies' range in Mexico; we anticipate these impacts will continue into the future.

*Grazing*

Effects of grazing and browsing from cattle, sheep, and goats include eating and trampling of coastal scrub plants. In the 2010 5-year review, we found that the effects of grazing can result in the loss and modification of coastal California gnatcatcher habitat and promote vegetation type conversion (the modification of one habitat type to another through the effects of one or more stressors working individually or in combination—

ultimately resulting in the destruction of the original habitat type) (see the *Vegetation Type Conversion* section below); at that time, we concluded that grazing was a minor threat to the subspecies (Service 2010, pp. 18, 21). Data from the FMMP indicate that there have been substantial declines in grazing land in San Diego and Riverside Counties from 1984 to 2012. These declines range from approximately 19,500 to 34,000 acres (7,689 to 13,759 ha). A smaller decline was reported for Orange County (3,265 ac (1,321 ha)), and a small increase was reported for Los Angeles County (6,066 ac (2,455 ha)) (CDC 2016), though not all areas of these counties have been inventoried. Overall, grazing is considered a low-level stressor within the subspecies' range in the United States that has a temporary impact to only small amounts of habitats and individual gnatcatchers, due to the decline in grazing activity and increased regulation of grazing by local jurisdictions (for instance, city ordinances).

The effects of grazing practices to coastal California gnatcatcher habitat in Mexico are less concentrated as compared to the United States because livestock are seasonally moved. However, grazing in coastal scrub habitat in Mexico can still result in vegetation type conversion, and as noted above, land clearing for grazing purposes has been documented within northern Baja California (Meyer *et al*. 2016, p. 10). Therefore, grazing continues to pose a medium-level stressor that temporarily impacts large patches of habitat and gnatcatchers at the population level within the subspecies' range in Mexico.

*Wildland Fire*

Wildland fire can result in the direct loss of the coastal scrub plants that the coastal California gnatcatcher uses for foraging, breeding, and sheltering. In our 2010 5-

year review, we found that wildland fire poses a threat to coastal California gnatcatcher habitat (Service 2010, pp. 15–18, 21). In that review, we noted that, absent other disturbances, coastal scrub vegetation can re-grow in some areas post-wildland fire in as little as approximately 3 to 5 years (Service 2010, p. 21). However, new information suggests that the process needed for coastal scrub vegetation to recover sufficiently to provide suitable habitat for the coastal California gnatcatcher is more complex. Winchell and Doherty (2014, p. 543) examined coastal California gnatcatcher recolonization rates after the wildland fires of 2003 in San Diego County; they found that coastal California gnatcatchers recolonize burned areas from the outside in, "[moving] in from the fire perimeter, rather than colonizing the center of the burned area immediately" (see also van Mantgem *et al*. 2015, p. 136). Moreover, the quality of the habitat where recolonization occurs is also important, with higher-quality unburned habitat supporting source populations for recolonization of burned areas and higher-quality burned habitat being more likely to be recolonized as the vegetation regrows (Winchell and Doherty 2014, p. 543). This study concluded that the coastal California gnatcatcher will recolonize burned areas, but that it can take more than 5 years post-burn for populations to reach pre-burn occupancy levels, even in higher-quality habitat areas (Winchell and Doherty 2014, p. 543).

Similarly, a 2012 study of coastal California gnatcatchers within the Central and Coastal Reserves in Orange County found that, following two large fires in 2007 (Windy Ridge and Santiago Fires) that burned approximately 75 percent of the Central Reserve, occupancy of surveyed plots in 2011 (4 years post-fire) was 10.1 percent (7 of 65 plots) in burned areas (Leatherman Bioconsulting Inc. 2012, pp. i, 5). The severity of these fires within the Central Reserve also affected occupancy, with no occupancy of coastal California gnatcatchers observed within severely burned plots, as compared to 23 percent occupancy for lightly burned plots (Leatherman Bioconsulting Inc. 2012, p. 5). The 2007 fires resulted in a large loss of coastal sage scrub habitat in the Central Reserve, and the study found that only 12.7 percent of plots were occupied by the subspecies as compared to 34.3 percent of occupied plots for the Coastal Reserve (Leatherman Bioconsulting Inc. 2012, p. 5). These findings are supported by an observation made by one land manager who submitted information to us in response to our request for information in our recent 90-day finding (79 FR 78775; December 31, 2014). This land manager indicated that it took 10 years of restoration activities after the 2003 San Diego wildland fires for coastal California gnatcatcher to return to previously occupied habitat in certain burned areas within San Diego County (Johanson 2015, pers. comm.). The U.S. Geological Survey, in partnership with the San Diego Management and Monitoring Program, is conducting additional research to better understand the effects of wildland fire on coastal California gnatcatcher occupancy within coastal scrub vegetation in southern California (Kus and Preston 2015, entire).

As discussed in our 2010 5-year review (Service 2010, pp. 15–18), the frequency of wildland fire has risen due to an increase in rates of ignition along the urban-wildland interface and controlled burning practices in Mexico. The greater number of fires, many of which have burned large areas of coastal scrub, has resulted in more areas of young growth coastal scrub vegetation that do not provide suitable coastal California gnatcatcher habitat. The 2010 5-year review noted that roughly 235,226 ac (95,193 ha) of modeled coastal California gnatcatcher habitat in the United States burned from 2003 to

2007 (Service 2010, pp. 15–17), which included several very large fires (see Service 2010, p. 16, Figure 3). As noted above (see *Urban and Agricultural Development* section), that analysis used modeled habitat consisting of coastal scrub vegetation within the U.S. portion of the range of the coastal California gnatcatcher. Using updated fire perimeter spatial data from the California Department of Fire and Forestry Protection (CDF) (CDF 2014) and our previously defined modeled coastal California gnatcatcher habitat, we estimated that 54,429 ac (22,027 ha) burned from 2008–2014, which also includes areas that may have burned during both the 2003–2007 and 2008–2014 time periods (Service 2016a). For southern California fires in 2015, we evaluated fire perimeter geospatial data and determined that the Calgrove Fire (439 ac (177.6 ha) total) in Los Angeles County burned approximately 167.5 ac (67.8 ha) of coastal California gnatcatcher habitat (Service 2016a). In total, from 2003 to 2015, approximately 289,822 ac (117,286 ha) or about 45 percent of modeled coastal California gnatcatcher habitat has burned.

Wildland fire, and how often it reoccurs in an area, is a major contributor to vegetation type conversion from coastal sage scrub to annual grassland, a vegetation type that does not support the breeding, feeding, or sheltering needs of the coastal California gnatcatcher. This is particularly problematic when frequency of wildland fires increases above the historic fire regime for coastal sage scrub, which increases the incidence of vegetation type conversion. In conjunction with several other stressors, wildland fires promote the growth of nonnative plant species, which can outcompete and displace native plant species. This occurrence results in the modification and, ultimately, the loss of coastal scrub habitat. Furthermore, the senescence of these annual nonnative annual plants creates higher fuel loads than are found in native coastal scrub habitat, accelerating the effects of the wildland fire–type conversion feedback loop (see *Vegetation Type Conversion* section below). Our spatial data show that a total of about 53,343 ac (21,587 ha) of modeled coastal California gnatcatcher habitat in the United States has burned at least twice since 2003, with some areas having burned three to four times (Service 2016a).

At the time of listing, wildland fire was identified as a substantial threat to the coastal California gnatcatcher and its habitat; it was further identified as an ongoing threat in the 2010 5-year review. Although currently established NCCP/HCPs provide for the establishment of coastal sage scrub reserves and include fire management as one of their primary objectives, there is no mechanism or conservation measure currently in place that can fully prevent the recurrence of natural or human-caused destructive wildland fires in coastal California gnatcatcher habitat. Therefore, wildland fire represents a medium-level stressor leading to the destruction, modification, or curtailment of habitat or range of the coastal California gnatcatcher that causes large-scale, temporary alterations to coastal sage scrub habitat and may result in the loss of some gnatcatcher pairs throughout the subspecies' range. According to the best available data, it will continue to impact the subspecies and its habitat into the future.

*Vegetation Type Conversion*

The presence of invasive, nonnative plant species, in combination with one or more stressors, such as severe physical disturbance (for example, clearing by heavy machinery), livestock activity, wildland fire, and anthropogenic atmospheric pollutants (particularly nitrogen compounds) can cause a shift from native plants towards a nonnative plant community and result in vegetation type conversion. In the 2010 5-year review, we found that vegetation type conversion of coastal sage scrub to nonnative grasses was an ongoing threat to the coastal California gnatcatcher, given that nonnative grasses do not support breeding for the subspecies (Service 2010, pp. 18–21). Depending on the influencing factors, this conversion can occur over various temporal and spatial scales. In particular, the nonnative annual plant–wildland fire feedback loop can result in the type conversion of large areas of habitat over a relatively short period of time (Service 2010, pp. 15–18). Information provided to us by two land managers within reserves in San Diego County indicates that active management to control nonnative vegetation is needed to maintain habitat quality due to re-occurring wildand fires (Center for Natural Lands Management 2015, pers. comm.; Johanson 2015, pers. comm.).

The NCCP/HCP planning process includes measures for managing coastal scrub vegetation, and current management is reducing the magnitude of the effects of type-conversion within the range of the coastal California gnatcatcher in the United States. Habitat is being added as managed reserves under the NCCP/HCPs at a pace that is roughly in keeping with habitat losses from urban development and other covered activities. However, the process is not yet complete for the decades-long permits issued for the NCCP/HCPs within the subspecies' range. In addition, management plans for each preserve area are not yet complete for these long-term plans, and ensuring sufficient resources for perpetual management of the reserves that addresses existing and future stressors, poses a challenge common to all regional NCCP/HCPs. These circumstances can lead to uncertainty regarding whether long-term management can adequately address vegetation type conversion in the future.

Therefore, vegetation type conversion represents a medium-level stressor leading to the destruction, modification, or curtailment of habitat or range of the coastal California gnatcatcher and causing long-term habitat alterations and impacts to gnatcatchers across the range of the subspecies. The best available scientific and commercial information indicates that vegetation type conversion will continue to have long-term impacts into the future.

**Climate Change**

*Background*

In this section, we consider observed or expected environmental changes resulting from ongoing and projected changes in climate. The effects of climate change were not addressed in detail in previous status reviews.

As defined by the Intergovernmental Panel on Climate Change (IPCC), the term "climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2013a, p. 1,450). The term "climate change" thus refers to a change in the mean or the variability of relevant properties, which persists for an extended period, typically decades or longer, due to natural conditions (for example, solar cycles) or human-caused changes in the composition of atmosphere or in land use (IPCC 2013a, p. 1,450).

Scientific measurements spanning several decades demonstrate that changes in climate are occurring. In particular, warming of the climate system is unequivocal and many of the observed changes in the last 60 years are unprecedented over decades to millennia (IPCC 2013b, p. 4). The current rate of climate change may be as fast as any extended warming period over the past 65 million years and is projected to accelerate in the next 30 to 80 years (National Research Council 2013, p. 5). Thus, rapid climate change is adding to other sources of extinction pressures, such as land use and invasive species, which will likely place extinction rates in this era among just a handful of the severe biodiversity crises observed in Earth's geological record (American Association for the Advancement of Sciences (AAAS) 2014, p. 17).

Examples of various other observed and projected changes in climate and associated effects and risks, and the bases for them, are provided for global and regional scales in recent reports issued by the IPCC (2013c, entire; 2014, entire), and similar types of information for the United States and regions within it can be found in the National Climate Assessment (Melillo *et al*. 2014, entire).

Results of scientific analyses presented by the IPCC show that most of the observed increase in global average temperature since the mid-20$^{th}$ century cannot be explained by natural variability in climate and is "extremely likely" (defined by the IPCC as 95 to 100 percent likelihood) due to the observed increase in greenhouse gas (GHG) concentrations in the atmosphere as a result of human activities, particularly carbon dioxide emissions from fossil fuel use (IPCC 2013b, p. 17 and related citations).

Scientists use a variety of climate models, which include consideration of natural processes and variability as well as various scenarios of potential levels and timing of GHG emissions, to evaluate the causes of changes already observed and to project future changes in temperature and other climate conditions. Model results yield very similar projections of average global warming until about 2030; thereafter, the magnitude and rate of warming vary through the end of the century depending on the assumptions about population levels, emissions of GHGs, and other factors that influence climate change. Thus, absent extremely rapid stabilization of GHGs at a global level, there is strong scientific support for projections that warming will continue through the 21st century, and that the magnitude and rate of change will be influenced substantially by human actions regarding GHG emissions (IPCC 2013b, 2014; entire).

Global climate projections are informative, and in some cases, the only scientific information available for us to use. However, projected changes in climate and related impacts can vary substantially across and within different regions of the world (for example, IPCC 2013c, entire; IPCC 2014, entire) and within the United States (Melillo *et al*. 2014, entire). Therefore, we use "downscaled" projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for analyses of a given species (see Glick *et al*. 2011, pp. 58–61, for a discussion of downscaling).

Various changes in climate may have direct or indirect effects on a species. These may be positive, neutral, or negative, and they may change over time, depending on the species and other relevant considerations, such as interactions of climate with other variables such as habitat fragmentation (for examples, see Franco *et al.* 2006; Forister *et al*. 2010; Galbraith *et al*. 2010; Chen *et al*. 2011; Bertelsmeier *et al*. 2013, entire). In addition to considering individual species, scientists are evaluating potential climate change-related impacts to, and responses of, ecological systems, habitat conditions, and groups of species (see, for example, Deutsch *et al*. 2008; Berg *et al*. 2010; Euskirchen *et* *al.* 2009; McKechnie and Wolf 2010; Sinervo *et al*. 2010; Beaumont *et al*. 2011; McKelvey *et al*. 2011; Rogers and Schindler 2011; Bellard *et al*. 2012).

*Temperature*

Regional temperature observations for assessing climate change are often used as an indicator of how climate is changing. The Western Regional Climate Center (WRCC) has defined 11 climate regions for evaluating various climate trends in California (Abatzoglou *et al*. 2009, p. 1,535). The relevant WRCC climate region for the distribution of the coastal California gnatcatcher in southern California is primarily the South Coast Region.

Three indicators of temperature, the increase in mean temperature, the increase in maximum temperature, and the increase in minimum temperature illustrate trends in climate change in California. For the South Coast Region, linear trends (evaluated over a 100-year time period) indicate an increase in mean temperatures (Jan–Dec) of approximately 2.65 °F (± 0.49 °F) (1.47 ± 0.27 °C) since 1895 and 4.17 °F (± 1.21 °F) (2.32 ± 0.67 °C) since 1949 (WRCC 2016, p. 6). Similarly, the maximum temperature 100-year trend for the South Coast Region shows an increase of about 1.94 °F (± 0.52 °F) (1.08 ± 0.29 °C) since 1895 and 3.16 °F (± 1.32 °F) (1.75 ± 0.73 °C) since 1949 (WRCC 2016, p. 9). Likewise, the minimum temperature 100-year trend for the South Coast Region shows an increase of about 3.37 °F (± 0.52 °F) (1.87 ± 0.29 °C) since 1895 and 5.19 °F (± 1.22 °F) (2.88 ± 0.68 °C) since 1949 (WRCC 2016, p. 12). It is reasonable to assume the rate of temperature increase for this region is higher for the second time period (since 1949) than for the first time period (since 1895) due to the increased use of fossil fuels in the 20th century. Even if that is not the mechanism, it is clear temperatures have increased in the South Coast Region since the start of data collection.

These observed trends provide information as to how climate has changed in the past. However, we must also consider whether and how climate may change in the future. Climate models can be used to simulate and develop future climate projections. Pierce *et al*. (2013, entire) presented both statewide and regional probabilistic estimates of temperature and precipitation changes for California (by the 2060s) using downscaled data from 16 global circulation models and 3 nested regional climate models. The study looked at a historical (1985–1994) and a future (2060–2069) time period using the IPCC Special Report on Emission Scenarios A2 (Pierce *et al*. 2013, p. 841). This IPCC-defined scenario was used for the IPCC's Third and Fourth Assessment reports, and it is based on a global population growth scenario and economic conditions that result in a relatively high level of atmospheric GHGs by 2100 (IPCC 2000, pp. 4–5; see also Stocker *et al*. 2013, pp. 60–68, and Walsh *et al*. 2014, pp. 25–28 for discussions and comparisons of the prior and current IPCC approaches and outcomes). Importantly, the projections by Pierce *et al*. (2013, pp. 852–853) include daily distributions and natural internal climate variability. Simulations using these downscaling methods project an increase in yearly temperature for the southern California coastal region ranging from 1.6 °C to 2.5 °C (2.9 °F to 4.5 °F) by the 2060s time period, compared to 1985–1994 (Pierce *et al*. 2013, p. 844). Averaging across all models and downscaling techniques, the simulations project a yearly-averaged warming of 2.1 °C (3.78 °F) by the 2060s (Pierce *et al*. 2013, p. 842).

*Precipitation*

Precipitation patterns can also be used as an indicator of how climate is changing. Killam *et al*. (2014, entire) evaluated trends in precipitation for 14 meteorological stations within all of California using annual precipitation data from the National Climatic Data Center. This study found an increasing trend in annual precipitation since 1925 for the northern and central regions of California and decreasing or minimal changes in southern California; however, none of the trends for these stations were significant (Killam *et al*. 2014, p. 171). The authors concluded that it is unclear as to whether there is a recognizable climate change signal in these precipitation records since annual variability in precipitation overwhelmed their observed trends, particularly precipitation patterns attributed to both the El Niño–Southern Oscillation and the Pacific decadal oscillation (multidecadal shifts in warm and cool phases in North Pacific sea surface temperatures) (Killam *et al*. 2014, p. 168).

Statewide and regional probabilistic estimates of precipitation changes for California were evaluated by Pierce *et al*. (2013, entire). Averaging across all models and downscaling methods, the simulations projected an annual mean decrease in precipitation for southern California (approximately 9 percent for the southern California coastal region) over the 2060–2069 time period compared to the mean over the 1985–1994 time period, but there was significant disagreement across the models (Pierce *et al*. 2013, pp. 849, 854).

Dynamic downscaled simulations indicate larger increases in summer (June–August) precipitation by the 2060s (as compared to statistical downscaling methods) within the region of California affected by the North America monsoonal flow (Pierce *et al*. 2013, pp. 851, 855). The North American monsoon is a regional-scale circulation that develops over the American Southwest during the months of July through September, affecting southern California and other locations in this region (Douglas *et al*. 2004, entire). Occasionally, hurricanes and tropical storms are captured in the monsoon circulation, which can result in heavy summer rains in the normally dry areas of the Southwest (Douglas *et al*. 2004, p. 11). As an example, from July 18–20, 2015, remnants of tropical storm Dolores, which had developed into a Category 4 hurricane off the coast of Baja California, generated record July rainfall amounts for several locations in southern California (Fritz 2015, entire). This storm and additional monsoonal-related rain events during the summer of 2015 in southern California were enhanced by higher than normal sea surface temperatures and the developing El Niño pattern in the Pacific Ocean (Serna and Lin 2015, p. B5).

*Climate Change and Coastal California Gnatcatchers*

The potential changes in climate described above are expected to have some effect on the coastal California gnatcatcher and its habitat. While the physical and biological mechanisms that result in the establishment of coastal scrub or chaparral vegetation are unclear, minimum temperatures, maximum temperatures, and precipitation (both amount and seasonality) within the southern California coastal region represent important influences on the subspecies and its habitat (Franklin 1998, p. 745). As noted above, there is little consensus on future trends in precipitation in southern California; however, it is highly likely that minimum and maximum temperatures will continue to rise. Malanson and O'Leary (1995, p. 219) suggested that higher average temperatures in the future may create an upslope shift in coastal scrub vegetation into areas that are currently occupied by chaparral. This may expand or shift areas that currently provide suitable habitat for coastal California gnatcatchers. Similarly, because the subspecies' distribution is thought to be limited by low temperatures (Mock 1998, p. 415), warmer minimum temperatures may also allow for coastal California gnatcatchers to survive at higher elevations, thereby allowing the subspecies to extend its range into areas previously not occupied (Preston *et al*. 2008, p. 2,512). In contrast, climate change may affect nutrient cycling (Allen *et al*. 1995, entire) or may promote a wildland fire regime with increased fire frequency (Batllori *et al*. 2013, entire); both of these effects would create conditions more favorable for vegetation type conversion to nonnative annual grassland, which would be unsuitable habitat for coastal California gnatcatchers.

*Climate Change Summary*

Climate change due to global warming is influencing regional climate patterns that may result in changes to the habitat for the coastal California gnatcatcher into the mid-21st century (approximately 2060s). While climate change may expand or shift the coastal California gnatcatcher's preferred habitat of coastal scrub vegetation in some areas, it may also create conditions more favorable for vegetation type conversion to unsuitable habitat such as nonnative annual grasslands. The best available regional data on current and potential future trends related to climate change, within the range of the coastal California gnatcatcher, indicate that the effects of climate change is a low- to medium-level stressor at the present time that is anticipated to result in shifts to the distribution of the subspecies' habitat and that may potentially affect gnatcatchers at the individual or population level. Based on model projections, we can reliably predict these changes will continue into the mid-21st century (2060s).

*Disease*

Two diseases have been identified as potential threats to the coastal California gnatcatcher, West Nile virus and Newcastle disease. These are discussed in greater detail in our 2010 5-year review where we concluded that disease was not a significant threat to the subspecies (Service 2010, pp. 21–22). Because known West Nile virus cases and the range of the coastal California gnatcatcher overlap geographically, the subspecies has likely been exposed to West Nile virus. While new information suggests that the impact to birds in North America has been widespread (George *et al.* 2015, entire), we have no evidence of detection of West Nile virus in the coastal California gnatcatcher and no information indicating that this disease has caused any decline in coastal California gnatcatcher populations. Furthermore, Newcastle disease does not appear to have affected gnatcatchers (Service 2010, p. 22). In summary, there is no evidence that disease is a stressor at the present time to the coastal California gnatcatcher, nor do we expect it to be into the future.

*Predation*

The effects of predation on the coastal California gnatcatcher are discussed in greater detail in our 2010 5-year review, where we concluded that predation is not a significant threat to the subspecies (Service 2010, pp. 22–24). Predation undoubtedly occurs among all life stages of the coastal California gnatcatcher, but only nest predation has been previously identified as affecting recruitment and survival at levels that could have potential effects on the population (such as reduction in fledging success). Nest predation rates for the coastal California gnatcatcher are higher than most open-nesting passerines because they occupy a naturally predator-rich environment (Service 2010, p. 23). However, the life-history strategy of the coastal California gnatcatcher allows pairs to re-nest repeatedly, compensating for this potential stressor. Therefore, we conclude that predation continues to represent a low-level impact to the subspecies that affects individual pairs of gnatcatchers, but it is not having a population-level impact at the present time, and this situation is not expected to change into the future.

*Fragmentation*

Fragmentation represents a suite of stressors that affect a species at various levels and scales. At its simplest, it involves a large, continuous block of habitat being broken up into smaller pieces, which become isolated from each other within a mosaic of other habitats. It is, therefore, not unrelated to habitat destruction and type conversion (see the *Urban and Agricultural Development* section and *Vegetation Type Conversion* sections above). However, changes in proximity to unsuitable habitat, distance to other areas of suitable habitat, size of habitat, and the length of time a fragment has been isolated may all have negative impacts on individuals of the species, such as increased predation rates, genetic isolation, or increased risk of local extirpation.

As discussed in our 2010 5-year review, the coastal California gnatcatcher is not particularly sensitive to edge or distance effects (Service 2010, p. 32). This characteristic is further supported by new information indicating that populations of coastal California gnatcatchers within the United States are fairly well connected over large areas. However, some populations (for example, the Palos Verdes Peninsula, greater Ventura County, and Coyote Hills populations) are currently separated by large distances by areas of non-habitat and, therefore, are not as well connected with the populations in the rest of southern California (Vandergast *et al*. 2014, pp. 8–9). We also noted in the 2010 5-year review (Service 2010, p. 32) that the coastal California gnatcatcher appeared to be somewhat susceptible to the effects associated with small fragment size (area), but new information suggests otherwise (Winchell and Doherty 2014, p. 543). Our concern at that time was that small areas of habitat would not support coastal California gnatcatchers over time and that the loss of the gnatcatcher population in a given (small) patch would be permanent. While a given patch of suitable coastal California gnatcatcher habitat may not always be occupied by the subspecies, these patches of habitat can be recolonized over time (Winchell and Doherty 2014, p. 543). Winchell and Doherty (2014, p. 543) also found that coastal California gnatcatchers gradually recolonize a regrowing burned area from the perimeter inwards (see *Wildland Fire* section above), which indicates that coastal California gnatcatchers have some level of sensitivity to spatial and temporal elements in habitat fragments.

Ongoing and anticipated implementation of regional NCCP/HCPs is expected to create a network of core-and-linkage habitat areas, thereby preventing or reducing the effects of future habitat fragmentation for much of the U.S. range of the coastal California gnatcatcher. The core areas are large, mostly unfragmented areas, while linkage areas are intended to provide continuous or “stepping stone” corridors for coastal California gnatcatcher movement and dispersal. Thus, as indicated by new information from Vandergast *et al*. (2014, entire) and Winchell and Doherty (2014, entire), the ability of the coastal California gnatcatcher to move between and recolonize habitat areas within the U.S. range, including the existing preserve-and-linkage areas, helps to reduce some of the effects associated with habitat fragmentation, although connectivity remains somewhat limited at the larger scales.

The new information we have received since the 2010 5-year review suggests that fragmentation is a threat of lower magnitude than was described at the time of listing. However, the effects of fragmentation are more significant than previously recognized for those coastal California gnatcatcher populations that have become widely separated due to urban development and other habitat losses or modifications (for example, wildland fire), particularly the geographically isolated populations in Ventura County, Palos Verdes (western Los Angeles County), and Coyote Hills (northern Orange County) (Vandergast *et al*. 2014, pp. 8, 12). Therefore, we consider the effects of fragmentation to represent a low- to medium-level stressor to the subspecies within portions of its range, and we can reliably predict that this level of stressor will continue into the future.

*Brood Parasitism*

Rates of brood parasitism by invasive, nonnative brown-headed cowbirds (*Molothrus ater*) appear to vary throughout the range of the coastal California gnatcatcher, depending upon nearby land uses (for example, higher rates of brood parasitism near livestock and agriculture). Because brown-headed cowbirds are thought to have invaded coastal southern California during the 20$^{th}$ century, any rate of brood parasitism exceeds the historical rate of parasitism. However, the re-nesting behavior of the coastal California gnatcatcher following a failed nesting attempt enables individual birds to reduce the magnitude of this threat, as opposed to some migratory songbirds that do not re-nest as readily. Additionally, cowbird trapping has been found to be an effective tool and has helped to reduce impacts to the coastal California gnatcatcher (as informed by monitoring) within many of the reserves established under regional NCCP/HCPs (Service 2010, p. 33). Additionally, certain ESA section 10(a)(1)(A) permit holders may be authorized to conduct coastal California gnatcatcher nest monitoring activities that may include the removal of brown-headed cowbird chicks and eggs (with minimal disturbance to nesting gnatcatchers). At the discretion of the permittee, these activities may further include replacement of cowbird eggs with dummy eggs to preclude the abandonment of small clutches. These activities help to decrease the impact of cowbird parasitism on individual coastal California gnatcatchers. Given the subspecies' ability to re-nest following nest failure along with ongoing management, we conclude brood parasitism is a low- to medium-level stressor affecting some populations of coastal California gnatcatchers throughout the subspecies' range in the United States, and we expect this level of stressor will continue into the future. We have no specific information on the impact of brown-headed cowbirds on coastal California gnatcatcher populations in Mexico, but brown-headed cowbirds occur as a breeding species along the length of the Baja California peninsula (see Erickson *et al*. 2007, p. 583), including throughout the range of the coastal California gnatcatcher. We expect that the level of impact of this stressor in Mexico is similar to that in unmanaged areas of the United States.

**Existing Regulatory Mechanisms**

Existing regulatory mechanisms that affect the coastal California gnatcatcher include laws and regulations promulgated by Federal and State governments in the United States and in Mexico. In relation to *Factor D* under the Act, we consider relevant Federal, State, and Tribal laws, regulations, and other such mechanisms that may minimize any of the threats we describe under the other four factors, or otherwise enhance conservation of the species. We give strongest weight to statutes and their implementing regulations and to management direction that stems from those laws and regulations; an example would be State governmental actions enforced under a State statute or constitution, or Federal action under statute. For currently listed species, we consider the adequacy of existing regulatory mechanisms to address threats to the species absent the protections of the Act. Potential threats acting on the coastal California gnatcatcher for which governments may have regulatory control include impacts associated with urban and agricultural development, vegetation type conversion, wildland fire, climate change, and brood parasitism.

Federal Mechanisms

*National Environmental Policy Act (NEPA)*

All Federal agencies are required to adhere to the NEPA of 1970 (42 U.S.C. 4321 et seq.) for projects they fund, authorize, or carry out. Prior to implementation of such projects with a Federal nexus, NEPA requires the agency to analyze the project for potential impacts to the human environment, including natural resources. However, NEPA does not impose substantive environmental obligations on Federal agencies—it merely prohibits an uninformed agency action. Although NEPA requires full evaluation and disclosure of information regarding the effects of contemplated Federal actions on sensitive species and their habitats, it does not by itself regulate activities that might affect the coastal California gnatcatcher; that is, effects to the subspecies and its habitat would receive the same scrutiny as other plant and wildlife resources during the NEPA process and associated analyses of a project's potential impacts to the human environment.

*Endangered Species Act of 1973, as amended (Act)*

Upon its listing as threatened, the coastal California gnatcatcher benefited from the protections of the Act, which include the prohibition against take and the requirement for interagency consultation for Federal actions that may affect the species. Section 9 of the Act and Federal regulations prohibit the take of endangered and threatened species without special exemption. The Act defines "take" as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 U.S.C. 1532(19)). Our regulations define "harm" to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Our regulations also define "harass" as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3).

Section 7(a)(1) of the Act requires all Federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered species and threatened species. Section 7(a)(2) of the Act requires Federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. Because the Service has regulations that prohibit take of all threatened wildlife species (50 CFR 17.31(a)), unless modified by a rule issued under section 4(d) of the Act (50 CFR 17.31(c)), the regulatory protections of the Act are largely the same for wildlife species listed as endangered and as threatened.

A section 4(d) rule for the coastal California gnatcatcher was published on December 10, 1993 (58 FR 65088). Under that rule, incidental take of the coastal California gnatcatcher is not considered to be a violation of section 9 of the Act if the take results from activities conducted pursuant to the NCCP Act of 1991 and in accordance with an approved NCCP plan, provided that the Service determines that such a plan meets the issuance criteria of an "incidental take" permit pursuant to section 10(a)(2)(B) of the Act and 50 CFR 17.32(b)(2). Under the section 4(d) rule, a limited amount of incidental take of the coastal California gnatcatcher within subregions actively engaged in preparing a NCCP plan will also not be considered a violation of section 9 of the Act, provided the activities resulting in such take are conducted in accordance with the NCCP Conservation Guidelines and Process Guidelines. Under section 10(a)(1)(B) of the Act, the Service may issue permits authorizing the incidental take of federally listed animal species. Incidental take permittees must develop and implement a habitat conservation plan (HCP) that minimizes and mitigates the impacts of take to the maximum extent practicable and that avoid jeopardy to listed species. Incidental take permits are available to private landowners, corporations, Tribal governments, State and local governments, and other non-Federal entities. These permits can reduce conflicts between endangered species and economic activities and develop important partnerships between the public and private sectors. As discussed in the *Urban and Agricultural Development* section above, we have issued incidental take permits for regional HCP and HCP/NCCPs covering approximately 59 percent of modeled gnatcatcher habitat, and two additional HCP/NCCPs are nearing completion.

Since 1993, the Service has addressed impacts to the coastal California gnatcatcher from urban development and other projects outside of the NCCP/HCP regional planning effort through the section 7 process. The projects have included residential and commercial developments, highway-widening projects, and pipeline projects, among others. Section 7 consultations have also been conducted with the U.S. Army Corps of Engineers for Clean Water Act permit applications, and other Federal agencies on specific actions. In addition to “projects,” we have consulted with the U.S. Marine Corps to address potential impacts to the gnatcatcher and its habitat from military training activities on Marine Corps Base Camp Pendleton (Camp Pendleton) and Miramar Corps Air Station (Miramar), and we have consulted with the U.S. Navy on actions related to the management of Naval Weapons Station Seal Beach Detachment Fallbrook (Detachment Fallbrook).

We reviewed the number of formal section 7 consultations for the coastal California gnatcatcher in our Tracking and Integrated Logging System (TAILS) database (initiated in 2007) that were completed from 1996 through March 2016. In total, the Carlsbad and Ventura Fish and Wildlife Offices completed 320 formal consultations during that time period (Service 2016b). In all of these consultations, we concluded that, due to the implementation of conservation measures to avoid, minimize, and offset impacts to the subspecies and its habitat, effects of the proposed actions were not likely to jeopardize the continued existence of the coastal California gnatcatcher and were not likely to result in the destruction or adverse modification of designated critical habitat for the subspecies. We will continue to evaluate impacts of proposed projects to the subspecies and its habitat for those areas outside of the NCCP/HCPs through other provisions of the Act, such as section 7 consultation, recovery implementation, and periodic status reviews.

Our evaluation confirms that urban development and associated threats continue for the coastal California gnatcatcher, but listing of the coastal California gnatcatcher under the Act as threatened has provided protection to the subspecies and its habitat, including the prohibition against take and the conservation mandates of section 7 for all Federal agencies.

*Sikes Act*

The Sikes Act (16 U.S.C. 670a–670f, as amended) directs the Secretary of Defense, in cooperation with the Service and State fish and wildlife agencies, to carry out a program for the conservation and rehabilitation of natural resources on military installations. The Sikes Act Improvement Act of 1997 (P.L. 105–85) broadened the scope of military natural resources programs, integrated natural resources programs with operations and training, embraced the tenets of conservation biology, invited public review, strengthened funding for conservation activities on military lands, and required the development and implementation of an Integrated Natural Resources Management Plan (INRMP) for relevant installations, which are reviewed every 5 years.

INRMPs incorporate, to the maximum extent practicable, ecosystem management principles, provide for the management of natural resources (including fish, wildlife, and plants), allow multipurpose uses of resources, and provide public access necessary and appropriate for those uses without a net loss in the capability of an installation to support its military mission. An INRMP is an important guidance document that helps to integrate natural resource protection with military readiness and training. In addition to technical assistance that the Service provides to the military, the Service can enter into interagency agreements with installations to help implement an INRMP. The INRMP implementation projects can include wildlife and habitat assessments and surveys, fish stocking, exotic species control, and hunting and fishing program management.

On Department of Defense lands, including Camp Pendleton, Detachment Fallbrook, and Miramar, coastal California gnatcatcher habitat is generally not subjected to threats associated with large-scale development. However, the primary purpose for military lands, including most gnatcatcher habitat areas, is to provide for military support and training. At these installations, INRMPs provide direction for project development and for the management, conservation, and rehabilitation of natural resources, including for the subspecies and its habitat. For example, on Camp Pendleton and MCAS Miramar, management measures that benefit the coastal California gnatcatcher and its habitat include nonnative vegetation control, nonnative animal control, and habitat enhancement and restoration (MCB Camp Pendleton 2007, p. F-25; MCAS Miramar INRMP 2010, pp. 7-18–7-19). Some restrictions on training and construction activities also apply during gnatcatcher breeding season to reduce impacts on nesting gnatcatchers (MCB Camp Pendleton 2007, p. F-25; MCAS Miramar INRMP 2010, pp. 7-18–7-19).

Without the protections provided to the subspecies and its habitat under the Act (that is, if the coastal California gnatcatcher was delisted), there would be less incentive for the Marine Corps or Navy to continue to include specific provisions (for example, monitoring) in their INRMPs to provide conservation benefits to the subspecies, beyond that provided under a more general integrated natural resource management strategy at these and other DOD installations.

State Laws Affecting the Coastal California Gnatcatcher

The coastal California gnatcatcher is designated as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW) (CDFG 2008). Although this designation is administrative and provides no formal legal status for protection, it is intended to highlight those species at conservation risk to State and Federal and local governments, land managers, and others, as well as to encourage research for those species whose life history and population status are poorly known (Comrack *et al*. 2008, p. 2).

*California Environmental Quality Act (CEQA)*

CEQA (California Public Resources Code 21000–21177) is the principal statute mandating environmental assessment of projects in California. The purpose of CEQA is to evaluate whether a proposed project may have an adverse effect on the environment and, if so, to determine whether that effect can be reduced or eliminated by pursuing an alternative course of action, or through mitigation. CEQA applies to certain activities of State and local public agencies; a public agency must comply with CEQA when it undertakes an activity defined under CEQA as a "project."

As with NEPA, CEQA does not provide a direct regulatory role for the CDFW or other State and local agencies relative to activities that may affect the coastal California gnatcatcher. However, CEQA requires a complete assessment of the potential for a proposed project to have a significant adverse effect on the environment. Among the conditions outlined in the CEQA Guidelines that may lead to a mandatory finding of significance are where the project "has the potential to . . . substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below selfsustaining levels; threaten to eliminate a plant or animal community; [or] substantially reduce the number or restrict the range of an endangered, rare or threatened species" (title 14 of the California Code of Regulations (CCR), § 15065(a)(1)). The CEQA Guidelines further state that a species "not included in any listing [as threatened or endangered] shall nevertheless be considered to be endangered, rare, or threatened, if the species can be shown to meet the criteria" for such listing (14 CCR 15380(d)). In other words, CEQA would require any project that may impact populations of these species to assess and disclose such potential impacts during the environmental review process (Osborn 2015, pers. comm.).

*The Natural Community Conservation Planning (NCCP) Act*

The NCCP program is a cooperative effort between the State of California and numerous private and public partners with the goal of protecting habitats and species. The NCCP program identifies and provides for the regional or area-wide protection of plants, animals, and their habitats while allowing compatible and appropriate economic activity. The program uses an ecosystem approach to planning for the protection and continuation of biological diversity (https://www.wildlife.ca.gov/Conservation/Planning/NCCP). Regional NCCPs provide protection to federally listed and other covered species by conserving native habitats upon which the species depend. NCCPs are usually developed in conjunction with habitat conservation plans (HCPs) prepared pursuant to the Act.

The 2010 5-year review discusses the NCCP program in greater detail. Currently, the following NCCP plans that cover the coastal California gnatcatcher are approved and being implemented: Multiple Species Conservation Program (one of four Subregional Plans in San Diego County with 5 of 11 Subarea Plans approved), San Diego County

Water Authority NCCP/HCP, San Diego Gas & Electric NCCP, San Diego Multiple Habitat Conservation Program (a second Subregional Plan in San Diego County with 1 of 6 Subarea Plans approved), Western Riverside County Multiple Species Habitat Conservation Plan (Western Riverside County MSHCP), and Orange County Central/Coastal NCCP/HCP (CDFW 2015, pp. 12 and 13). Additionally, the Orange County Transportation Authority M2 NCCP/HCP in Orange County and the Rancho Palos Verdes NCCP/HCP in Los Angeles County are nearing completion. The North County Multiple Species Conservation Plan and the East County Multiple Species Conservation Plan (CDFW 2015, pp. 12 and 13), the third and fourth Subregional Plans in San Diego County, are still in the development phase. Finally, the Orange County Southern Subregion HCP is not approved as an NCCP, but this plan is a regionally significant Service-approved HCP that includes core populations of the coastal California gnatcatcher and large expanses of coastal sage scrub.

These plans provide a comprehensive, habitat-based approach to the protection of covered species, including the coastal California gnatcatcher, by focusing on lands identified as important for the long-term conservation of the covered species and through the implementation of management actions for conserving those lands. These protections are outlined in the management actions and conservation objectives described within each plan. However, because the total habitat protection associated with these plans is not expected until plans are fully implemented, and because not all areas are covered, habitat loss is still impacting the gnatcatcher and is expected to continue into the future.

In our 2010 5-year review, we estimated that 59 percent of modeled coastal California gnatcatcher habitat in the United States would be conserved with full implementation of currently permitted, long-term Regional NCCP/HCPs (Service 2010, p. 15). We reviewed the most currently available reports for four regional NCCP/HCPs and one HCP to determine the amount of coastal sage scrub habitat that has been conserved as of the date of the respective final reports:

- For the San Diego County MSCP (City of San Diego, County of San Diego, City of Chula Vista, City of Poway, and City of La Mesa), the total number of acres of coastal sage scrub habitat conserved both inside and outside the preserve planning area is 49,871 ac (20,182 ha); conserved habitat inside the preserve planning area is approximately 42,129 ac (17,049 ha) or about 68 percent of the plan's target (City of Chula Vista 2015, p. 35; City of San Diego 2015, p. 15; County of San Diego 2015, p. 51).
- For the San Diego County MSCP, the City of Carlsbad reported 1,683 ac (681 ha) of coastal sage scrub conserved within their Habitat Management Preserve system as of December 2015 (84 percent of target) (Grim 2016, pers. comm.).
- For the Orange County Central–Coastal NCCP/HCP (as of the end of 2013), the amount of coastal sage scrub conserved is 17,809 ac (7,207 ha) (Nature Reserve of Orange County 2013).
- For the Western Riverside County MSHCP, the Western Riverside County Regional Conservation Authority (WRCRCA 2015, pp. 3-9–3-10) reported that 11,802 ac (4,776 ha) of coastal sage scrub was conserved from February 2000 to December 31, 2013.

With the addition of the Orange County Southern Subregion HCP, which reported coastal California gnatcatcher scrub habitat of 13,135 ac (5,315 ha) within reserves as of

December 2013 (Rancho Mission Viejo 2013), the total number is approximately 86,558 ac (35,028 ha) of coastal sage scrub conserved (within reserves established by these plans). This amount represents about 47 percent of the total target (182,976 ac (74,048 ha)) of coastal California gnatcatcher habitat to be preserved by the five plans described in our 2010 5-year review (Service 2010, p. 15).

In summary, while conservation is anticipated to continue within existing plan boundaries within the U.S. range of the coastal California gnatcatcher, habitat protection occurs in a step-wise fashion as areas are conserved, and the total habitat protection associated with a plan is not expected until plans are fully implemented. Once the plans are fully implemented upon completion of the permits (which last for 50–75 years), the plans would provide conservation for much of the 56 percent of the coastal California gnatcatcher’s range in the United States. However, the 44 percent of the subspecies range in Baja California is not subject to protections provided by NCCP/HCP plans. Therefore, the subspecies and its habitat remain susceptible to urban development and associated threats.

Without the protections provided to the subspecies and its habitat under the Act (that is, if the coastal California gnatcatcher was delisted), the current NCCP/HCPs may provide some ancillary benefits to the subspecies given that other federally listed species of plants and animals covered under these plans are also found within coastal sage scrub habitat (for example, Quino checkerspot butterfly (*Euphydrays editha quino*)). By continuing to implement the plans, the permittees would retain incidental take coverage for these other species. However, permittees under these regional plans could request permit modifications or request that their long-term permits be renegotiated should the coastal California gnatcatcher be delisted under the Act. Similarly, the NCCP/HCPs currently under development in southern California would likely require reevaluation. However, all conservation already implemented would continue to provide benefits to the coastal California gnatcatcher even if it was delisted. Because conservation and management for the coastal California gnatcatcher has not yet been fully implemented under the NCCP/HCPs in place and some NCCP/HCPs are not yet developed, all of the potential conservation anticipated under these plans is not yet fully assured absent the protections of the Act.

*Regulatory Mechanisms in Mexico*

As described above (see *Urban and Agricultural Development* section), we recently estimated that approximately 1,704,406 ac (689,749 ha) of coastal sage scrub habitat remains in Baja California from 30 °N to the United States-Mexico border (Service 2016a).

The Mexican Government recognizes the *atwoodi* subspecies of the California gnatcatcher (see taxonomic classification of Mellink and Rea 1994, pp. 59–62); Mellink and Rea (1994, p. 55) described *Polioptila californica atwoodi* as a new subspecies of California gnatcatcher from northwestern Baja California, Mexico. They defined a range for this novel subspecies as "from Rio de las Palmas and Valle de las Palmas (30 km SE of Tijuana) in the interior and at least Punta Banda along the coast south to Arroyo El Rosario, 32 to 30 °N" within coastal sage scrub and maritime succulent scrub plant communities (Mellink and Rea 1994, p. 55); this distribution mostly overlaps with what the Service considers to be the listed gnatcatcher subspecies (58 FR 16742; March 30, 1993).

This entity is listed as threatened under Mexico's *NORMA Oficial Mexicana* NOM–059–SEMARNAT–2010, Environmental Protection–Species of Wild Flora and Fauna Native to Mexico (*Protección ambiental–Especies nativas de México de flora y fauna silvestres–Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio–Lista de especies en riesgo*) (SEMARNAT 2010). Threatened species are defined under Mexican law as those which may be "in danger of disappearing in the short or medium term" if factors that adversely affect their viability, such as deterioration or modification of habitat, or directly reduce the size of their populations, continue to operate (SEMARNET 2010, p. 5). However, enforcement of this law generally depends upon an individual or a groups' willingness to modify proposed projects rather than the legal protections provided under the law (Hinojosa 2008, pers. comm.). Monitoring of compliance with this law is the responsibility of the *Secretaria de Medio Ambiente y Recursos Naturales* through its established entities. We do not have further information regarding the effectiveness of this law for protecting the coastal California gnatcatcher and its habitat.

In Mexico, the development of state and municipal plans is designed to regulate and control land use and various production activities as well as provide environmental protections and preservation and sustainability of natural resources (Conservation Biology Institute 2004, p. 31). As an example, an *ordenamiento ecológico* (ecological regulation/zoning ordinance) is being developed for the City of Tijuana to identify *áreas verdes* (important natural resource areas), and the *ordenamiento* will be used to guide land development within Tijuana (Conservation Biology Institute 2004, p. 31). Other State and Federal environmental laws in Mexico include *Ley General del Equilibrio*

*Ecológico y la Protección al Ambiente* and *Ley de Protección al Ambiente para el Estado de Baja California*, which require the preparation of an environmental impact study (*manifestación de impacto ambiental*) for any development project; if the project is determined to result in negative environmental impacts, the developer must undertake mitigation actions to minimize these impacts and/or restore natural conditions (Conservation Biology Institute 2004, p. 31).

*Existing Regulatory Mechanisms Summary*

Outside of the Act, few Federal conservation management and conservation measures exist throughout the U.S. range of the coastal California gnatcatcher that provide protections to the subspecies and its habitat. State management and conservation measures are limited primarily to the planning and implementation of the NCCP Act, and there is uncertainty as to whether the regional plans would continue to provide the full conservation benefits anticipated should the subspecies be delisted under the Act. Limited protection is provided to the coastal California gnatcatcher through the inclusion of its designation as a Species of Special Concern within State (CEQA) planning processes.

Based on the best available data, the listing of the *atwoodi* subspecies of the California gnatcatcher by the Mexican Government provides a limited level of protection or conservation benefit to the *atwoodi* populations found in Baja California. Comprehensive reserve areas for coastal sage scrub and chaparral vegetation have not been established in northern Baja California. While existing Mexican regulatory mechanisms may provide some protection for the subspecies, we lack information on implementation of those mechanisms specifically related to protection of the coastal California gnatcatcher, protection of habitat, and abatement of threats.

Therefore, although regulatory mechanisms are in place and provide some protection to the coastal California gnatcatcher and its habitat throughout its range, absent the protections of the Act (for example, section 7, section 9, and section 10(a)(1)(B)), these mechanisms would provide substantially less protection from the stressors currently acting on the subspecies such as urban and agricultural development. Moreover, some of the threats faced by the species and its habitat, including wildland fire, vegetation type conversion, and fragmentation, are not readily susceptible to amelioration through regulatory mechanisms.

**Cumulative Effects**

Threats can work in concert with one another to cumulatively create conditions that may impact the coastal California gnatcatcher or its habitat beyond the scope of each individual threat. The best available data indicate that cumulative impacts are currently occurring from the combined effects of a number of stressors, including vegetation type conversion, wildland fire, and the effects of climate change.

These stressors interact in multiple ways. As discussed in the *Wildand Fire* section above, the wildland fire–type conversion feedback loop promotes the degradation and eventual loss of coastal California gnatcatcher habitat, especially on a local scale where there are short intervals between fires (Service 2010, pp. 15–18). The effects associated with climate change have the potential to further contribute to the vegetation type conversion process, though it is not yet clear how climate change will interact with the ongoing conversion of coastal sage scrub to nonnative grasses and other vegetation types unsuitable for use by the coastal California gnatcatcher. It is also unclear whether it will increase or decrease the rate of change.

Furthermore, based on our analysis of the best available data, it is likely that the native plant communities that support the coastal California gnatcatcher in southern California are presently impacted by the cumulative effects of wildland fire and the warming effects of climate change. Yue *et al*. (2014, entire) developed projections of wildfire activity in southern California at mid-century (2016–2065) using the IPCC's A1B scenario (moderate growth in fossil fuel emissions in the first half of the 21st century but with a gradual decrease after 2050). Using regression models, the study found a likely doubling of area burned in southwestern California by midcentury, while parameterization models indicate a likely increase of 40 percent in this region under this IPCC scenario (Yue *et al.* 2014, p. 1,973). The analysis was unique in that the models considered the effects of future patterns of Santa Ana wind events. It indicates that a projected midcentury increase in November Santa Ana wind events will contribute to the increased area burned at that time of year (Yue *et al.* 2014, p. 1,990). The authors conclude that the results suggest that wildfire activity will likely increase in southwestern California due to rising surface temperatures (Yue *et al.* 2014, p. 1,989).

Stavros *et al*. (2014, entire) developed regional projections of the probability of very large wildland fires (defined as greater than or equal to 50,000 ac (20,234 ha)) under various climate change scenarios for the western United States. Their model results found a significant increase in the likelihood and frequency of very large fires for climate regimes projected in 2031–2060, relative to 1950–2005, in almost all areas, including southern California (Stavros *et al.* 2014, p. 460). These impacts are expected to continue into the future (to the 2060s based on climate change projections).

The climate change–wildland fire connection will likely result in a reduction in the amount of suitable habitat for the coastal California gnatcatcher and will likely lead to a greater chance of vegetation type conversion that degrades and eventually eliminates coastal California gnatcatcher habitat. Moreover, these stressors, working singly or in combination, are operating at a landscape scale. These stressors may affect large areas and may not be addressed by current management plans. Thus, in the absence of management to counteract the identified effects, these stressors are contributing to the habitat-degradation and type-conversion continuum that is occurring throughout the range of the subspecies. Therefore, as summarized above and as described in our 2010 5-year review, the best available data indicate that the cumulative effects of vegetation type conversion, wildland fire, and climate change will continue to act as a high-level stressor on the coastal California gnatcatcher and its habitat now and into the future.

**Finding**

In making this finding, we have followed the procedures set forth in section 4(a)(1) of the Act and regulations implementing the listing provisions of the Act in 50 CFR part 424. We reviewed the petition, information available in our files, and other available published and unpublished information. We sought input from subject matter experts and other Federal, State, and Tribal agencies. On the basis of the best scientific and commercial information available, we find that the petitioned action to delist the coastal California gnatcatcher is not warranted. Review of the best available scientific and commercial data did not show that the original determination, made at the time the species was classified as threatened in 1993, is now in error. Rather, using a multi-evidence criteria approach, the best available scientific and commercial data supports the coastal California gnatcatcher as a valid (distinguishable) subspecies.

For the purposes of our status review, as required by the Act, we considered the five factors in assessing whether the coastal California gnatcatcher is endangered or threatened throughout all of its range. In our threats analysis, we examined the best scientific and commercial information available regarding the past, present, and foreseeable future threats faced by the subspecies. We reviewed the information available in our files, information submitted by the public in response to our 90-day finding (79 FR 78775; December 31, 2014), and other available published and unpublished information. As described above in **Background**, the petitioners did not provide any new information on any of the factors. Based on our review of the best available scientific and commercial information, we find that the current and future threats are of sufficient imminence, intensity, or magnitude to indicate that the coastal California gnatcatcher remains likely to become an endangered species within the foreseeable future throughout all of its range. Therefore, the coastal California gnatcatcher currently meets the definition of a threatened species.

We evaluated each of the potential stressors discussed in the 2010 5-year review (Service 2010, entire), and we determined the following factors have impacted the coastal California gnatcatcher and its habitat or may affect gnatcatcher individuals or populations in the future: urban and agricultural development (*Factor A*), grazing (*Factor A*), wildland fire (*Factor A* and *Factor E*), vegetation type conversion (*Factor A*), climate change (*Factor A* and *Factor E*), disease (*Factor C*), predation (*Factor C*), fragmentation (*Factor A* and *Factor E*), and brood parasitism (*Factor E*). Disease (*Factor C*) and predation (*Factor C*) are having only local, small-scale impacts to the coastal California gnatcatcher and its habitat throughout its range; therefore, we do not consider disease or predation to be threats at this time.

Additionally, though brood parasitism (*Factor E*) is affecting individual coastal California gnatcatcher pairs throughout the species' range, the impacts in the United States are being reduced through available regulatory mechanisms and implementation of conservation measures, such as regional NCCP/HCP management plans and section 10(a)(1)(A) permits. Furthermore, the ability of the coastal California gnatcatcher to re-nest multiple times in one breeding season helps it to be resilient to brood parasitism by brown-headed cowbirds. Therefore, we do not find that brood parasitism poses a threat to the coastal California gnatcatcher at the present time, nor do we expect it to become a threat in the foreseeable future.

At this time, impacts from urban and agricultural development (*Factor A*) continue to be a medium- to high-level stressor for the coastal California gnatcatcher and its habitat. Implementation of existing HCPs and the ongoing development of additional NCCP/HCPs have significantly reduced the impacts of urban development to coastal California gnatcatcher habitat in the United States; however, none of the regional plans are fully implemented. We estimated that these plans encompass approximately 55 percent of coastal sage scrub habitat and that approximately 47 percent of the plans' conservation targets have been reached (Service 2016a), for a total of 28 percent of habitat conserved overall in the U.S. range of the subspecies by NCCP/HCP plans. Though we anticipate that additional habitat will be conserved with full implementation of the existing plans, total conservation of the areas identified within the plans is not expected until the plans are fully implemented. Overall, 49 percent of coastal sage scrub in the United States has no mechanism preventing conversion of the habitat for urban or agricultural uses (Service 2016a), and Mexico has few areas of coastal sage scrub protected from development. Therefore, though substantial progress has been made since the time of listing to conserve habitat that supports the coastal California gnatcatcher, we find that urban and agricultural development continues to pose a threat to the coastal California gnatcatcher and its habitat.

Though grazing (*Factor A*) is having only low-level impacts to coastal California gnatcatcher habitat in the United States, grazing in coastal scrub habitat in Mexico can still result in vegetation type conversion, and land clearing for grazing purposes has been documented within northern Baja California. Therefore, we find that grazing is posing a threat to the subspecies' habitat in Mexico, though habitat impacts can be temporary.

Wildland fire (*Factor A* and *Factor E*) was identified as a threat to the coastal California gnatcatcher and its habitat both at the time of listing and in our 2010 5-year review. Based on our analysis, although currently established NCCP/HCPs provide for the establishment of coastal sage scrub reserves and include fire management as one of their primary objectives, there is no mechanism or conservation measure that can fully prevent the recurrence of natural or human-caused destructive wildland fires in coastal California gnatcatcher habitat. Therefore, we find that wildand fire poses a threat to the coastal California gnatcatcher and its habitat throughout the range of the species and that this threat will continue to cause impacts into the foreseeable future.

Vegetation type conversion (*Factor A*) of coastal sage scrub to nonnative grasslands is ongoing throughout the range of the coastal California gnatcatcher. Effects of type conversion are currently being reduced through habitat management by NCCP/HCPs; however, management plans for each reserve area are not yet complete, and maintaining adequate funding for perpetual management of the reserves is a challenge common to all regional NCCP/HCPs. Therefore, vegetation type conversion is posing a threat to the coastal California gnatcatcher and its habitat, and we expect that these impacts will continue into the foreseeable future.

Climate change (*Factor A* and *Factor E*) is a low- to medium-level stressor that is anticipated to result in shifts to the distribution of the subspecies' habitat and that may potentially affect gnatcatchers at the individual or population level into the foreseeable future. However, the impacts from climate change are not well understood and under some projections may increase habitat for the species as coastal sage scrub moves to higher elevations, though the impacts from climate change on its own are not fully understood. Therefore, while impacts of climate change are not fully understood, climate change is considered a low- to moderate-level threat that may affect the distribution of the subspecies and its habitat in the future.

New information we have received since the 2010 5-year review suggests that fragmentation (*Factor A* and *Factor E*) at small geographic scales is a threat of lower magnitude than was described at the time of listing. However, the effects of fragmentation are more significant at large geographic (landscape) scales than previously recognized for those coastal California gnatcatcher populations that have become widely separated due to urban development and other habitat losses or modifications (such as wildland fire). Therefore, we find that fragmentation still poses a threat to portions of the coastal California gnatcatcher subspecies, and we expect that these impacts will continue into the foreseeable future.

Furthermore, cumulative impacts from climate change and other factors such as vegetation type conversion and wildland fire have the potential to significantly alter habitat that currently supports the coastal California gnatcatcher. The wildland fire–type conversion feedback loop promotes the degradation and eventual loss of coastal California gnatcatcher habitat, particularly given the increase in fire frequency from the historical fire regime. Recent studies (such as Stavros *et al.* 2014) indicate that with climate change, fire frequency and intensity may continue to increase, which would in turn increase the wildand fire–type conversion feedback loop. The effects associated with climate change have the potential to further contribute to the vegetation type conversion process, though the exact impacts to coastal sage scrub habitat are unknown. Therefore, we find that cumulative impacts of multiple stressors are a threat to the coastal California gnatcatcher, and that this threat is likely to continue at the same level or increase into the foreseeable future.

Available regulatory mechanisms, such as the combined NCCP/HCP program and INRMPs on local military bases are providing important protections that help reduce the threats affecting the coastal California gnatcatcher and its habitat, such as urban development, vegetation type conversion, and fragmentation. Absent the provisions of the Act, some of these protections would no longer be in place. In Mexico, the listing of the *atwoodi* subspecies of the California gnatcatcher provides only a limited level of protection or conservation benefit, and comprehensive reserve areas for coastal California gnatcatcher habitat have not been established in northern Baja California. Therefore, absent the protections of the Act, existing regulatory mechanisms would provide substantially less protection from the threats currently acting on the subspecies.

Moreover, some of the threats faced by the coastal California gnatcatcher, such as wildland fire, vegetation type conversion, and habitat fragmentation, cannot be readily ameliorated through the application of regulatory mechanisms. Therefore, we conclude that the best available scientific and commercial information indicates that these threats are continuing to impact the subspecies and its habitat throughout its range, and that these impacts will continue into the foreseeable future. At this time, many threats are being reduced through existing regulatory mechanisms, and we expect that full implementation of regional NCCPs/HCPs will provide protection to much of the coastal sage scrub habitat that supports the coastal California gnatcatcher. However, many areas are not yet protected by existing plans and other plans are still in development.

Furthermore, many threats remain on the landscape that are not fully managed, and the best available scientific and commercial information indicates that these threats are likely to continue, such that the coastal California gnatcatcher is likely to become an endangered species within the foreseeable future throughout all its range. Because we have determined that the coastal California gnatcatcher is likely to become an endangered species throughout all its range within the foreseeable future, no portion of its range can be "significant" for purposes of the Act's definitions of "endangered species" and "threatened species." See the Service's final policy interpreting the phrase "significant portion of its range" (SPR) (79 FR 37578; July 1, 2014).Therefore, we find that the coastal California gnatcatcher continues to meet the definition of a threatened species under the Act, but that the threats are not severe enough at this time such that the species is in danger of extinction throughout its range. Therefore, we find that reclassification to an endangered species is not warranted at this time.

We request that you submit any new information concerning the status of, or threats to, the coastal California gnatcatcher to our Carlsbad Fish and Wildlife Office (see **ADDRESSES**) whenever it becomes available. New information will help us monitor the subspecies and encourage additional conservation actions.

**References Cited**

A complete list of references cited is available on the Internet at *http://www.regulations.gov* in Docket Number FWS–R8–ES–2014–0058 and upon request from the Carlsbad Fish and Wildlife Office (see **ADDRESSES**).

**Author(s)**

The primary author(s) of this notice are the staff members of the Carlsbad Fish and Wildlife Office and Pacific Southwest Regional Office.

**Authority**

The authority for this action is section 4 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.).

Dated: August 15, 2016

Stephen Guertin

*Acting Director, U.S. Fish and Wildlife Service.*

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