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**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Parts 223 and 224**

[Docket No. 120425024-6232-06]

**RIN 0648-XB089**

**Endangered and Threatened Wildlife and Plants; Final Rule to List Eleven Distinct Population Segments of the Green Sea Turtle (*Chelonia mydas*) as Endangered or Threatened and Revision of Current Listings Under the Endangered Species Act**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce; United States Fish and Wildlife Service (USFWS), Interior.

**ACTION:** Final rule.

**SUMMARY:** NMFS and USFWS issue a final rule to list 11 distinct population segments (DPSs) of the green sea turtle (*Chelonia mydas*; hereafter referred to as the green turtle) under the Endangered Species Act (ESA). Based on the best available scientific and commercial data, and after considering comments on the proposed rule, we have determined that three DPSs are endangered species and eight DPSs are threatened species. This rule supersedes the 1978 final listing rule for green turtles. It applies the

existing protective regulations to the DPSs. Critical habitat is not determinable at this time but will be proposed in a future rulemaking. In the interim, the existing critical habitat designation (i.e., waters surrounding Culebra Island, Puerto Rico) remains in effect for the North Atlantic DPS.

**DATES:** This final rule is effective [*insert date 30 days after date of publication in the FEDERAL REGISTER*].

**ADDRESSES:** Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Room 13535, Silver Spring, MD 20910; or U.S. Fish and Wildlife Service, North Florida Ecological Services Office, 7915 Baymeadows Way, Suite 200, Jacksonville, FL 32256. The final rule, list of references, and other materials relating to this determination can be found at:

*<http://www.nmfs.noaa.gov/pr/species/turtles/green.htm>.*

**FOR FURTHER INFORMATION CONTACT:** Jennifer Schultz, NMFS (ph. 301–427-8443, e-mail *jennifer.schultz@noaa.gov*), or Ann Marie Lauritsen, USFWS (ph. 904–731–3032, e-mail *annmarie\_lauritsen@fws.gov*). Persons who use a Telecommunications Device for the Deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339, 24 hours a day, and 7 days a week.

**SUPPLEMENTARY INFORMATION:**

**Background**

On July 28, 1978, NMFS and USFWS, collectively referred to as the Services, listed the green turtle under the ESA (43 FR 32800). Pursuant to the authority that the statute provided, and prior to the current statutory definition of “species” that includes

DPSs, we listed the species as threatened, except for the Florida and Mexican Pacific coast breeding populations, which we listed as endangered. We published recovery plans for U.S. Atlantic (NMFS and USFWS, 1991) and U.S. Pacific (including the East Pacific; 63 FR 28359, May 22, 1998; NMFS and USFWS, 1998) populations of the green turtle (<http://www.nmfs.noaa.gov/pr/recovery/plans.htm>). NMFS designated critical habitat for the species to include waters surrounding Culebra Island, Puerto Rico, and its outlying keys (63 FR 46693, September 2, 1998).

On February 16, 2012, we received a petition from the Association of Hawaiian Civic Clubs to identify the Hawaiian green turtle population as a DPS and “delist” it. On August 1, 2012, NMFS, with USFWS concurrence, determined that the petition presented substantial information indicating that the petitioned action may be warranted (77 FR 45571). Our 5-year review (NMFS and USFWS, 2007) also recommended a review of the status of the species, in light of significant new information since its listing and in accordance with our DPS joint policy (61 FR 4722, February 7, 1996). We convened a Status Review Team, green turtle and ESA experts within the Services, who conducted a comprehensive status review of the species and published their findings as the “Status Review of the Green Turtle (*Chelonia mydas*) under the Endangered Species Act” (Seminoff *et al.*, 2015; hereafter referred to as the Status Review Report and available at [http://www.nmfs.noaa.gov/pr/species/Status%20Reviews/green\\_turtle\\_sr\\_2015.pdf](http://www.nmfs.noaa.gov/pr/species/Status%20Reviews/green_turtle_sr_2015.pdf)). The Status Review Report was peer-reviewed by 15 independent scientists with expertise in green turtle biology, genetics, endangered species policy, or related fields. We used the Status Review Report and additional information, which together provided the best

available scientific and commercial data, to make our listing determinations.

On March 23, 2015, we published the 12-month finding on the petition and proposed rule (80 FR 15271). We proposed to remove the existing ESA listings from 1978 and, in their place, list three endangered (Mediterranean, Central West Pacific, and Central South Pacific) and eight threatened (North Atlantic, South Atlantic, Southwest Indian, North Indian, East Indian-West Pacific, Southwest Pacific, Central North Pacific, and East Pacific) DPSs. We opened a 90-day comment period on the proposed rule and extended this comment period three times until September 25, 2015, for a total of 187 days (i.e., just over 6 months).

#### *Listing Determinations under the ESA*

Section 4(a)(1) of the ESA requires us to determine by regulation whether “any species is an endangered species or a threatened species because of any of the following 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” (16 U.S.C. 1533(a)(1); hereafter, the section 4(a)(1) factors). Section 3 of the ESA defines a “species” as “any subspecies of fish or wildlife or plants, and any DPS of any species of vertebrate fish or wildlife which interbreeds when mature” (16 U.S.C. 1532(16)). Section 3 of the ESA further defines an “endangered species” as “any species which is in danger of extinction throughout all or a significant portion of its range” and a “threatened species” as one “which is likely to become an endangered species within the

foreseeable future throughout all or a significant portion of its range” (16 U.S.C. 1532(6), (20)). The U.S. District Court for the District of Columbia noted that Congress included “a temporal element to the distinction between the categories of endangered and threatened species.” *In Re Polar Bear Endangered Species Act Listing and § 4(d) Rule Litigation*, 794 F. Supp.2d 65, 89 n. 27. (D.D.C. 2011). Thus, we interpret an “endangered species” to be one that is presently in danger of extinction. A “threatened species,” on the other hand, is not presently in danger of extinction, but is likely to become so within the foreseeable future (i.e., at a later time). In other words, the primary statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or within the foreseeable future (threatened). As we explained in the proposed rule, the foreseeable future applied in a particular listing determination must take into account the life history of the species, habitat characteristics, availability of data, particular threats under consideration, the ability to predict those threats, and the reliability of forecasts of changes in the species’ status in response to the threats. See also “The Meaning of ‘Foreseeable Future’ in Section 3(20) of the Endangered Species Act,” (M-37021, U.S. Department of the Interior, Office of the Solicitor, January 16, 2009).

The ESA does not define “distinct population segment,” but our 1996 joint policy identifies three elements that must be considered when identifying a DPS: (1) the discreteness of the population segment in relation to the remainder of the species to which it belongs; (2) the significance of the population segment to the species to which it belongs; and (3) the population segment’s conservation status (i.e., endangered or

threatened; 61 FR 4722, February 7, 1996). Section 4(c)(1) of the ESA requires us to revise the lists of threatened and endangered species to reflect recent determinations to list, remove, or change the status of a species (16 U.S.C. 1533(c)(1)). Section 4(b)(1)(A) requires us to make such determinations “solely on the basis of the best scientific and commercial data available...after conducting a review of the status of the species” and after considering conservation efforts (16 U.S.C. 1533(b)(1)(A)). This can be thought of as consisting of two steps: the status review and the listing determinations.

As we described more fully in the proposed rule, to identify potential DPSs, the Status Review Team members gathered the best available scientific and commercial data on green turtles. They evaluated the discreteness and significance of population segments. For each potential DPS, they described the demographic parameters that influence population persistence (i.e., abundance, growth rate or trend, spatial structure or connectivity, and diversity or resilience; McElhany *et al.*, 2000) and analyzed the section 4(a)(1) factors (16 U.S.C. 1533(a)(1)). For their analyses, the Status Review Team used a foreseeable future of 100 years, which represents approximately three generations of green turtles and is often used for projections of extinction risk in recovery plans and status reviews for long-lived species, such as whales and sea turtles (Angliss *et al.*, 2002; NMFS, 2005, 2010, 2011; Conant *et al.*, 2009; Seminoff *et al.*, 2015). To assess extinction risk, the Status Review Team used a critical risk threshold (i.e., quasi-extinction), which they defined as being met where a DPS, “has such low abundance, declining trends, limited distribution or diversity, and/or significant threats (untempered by significant conservation efforts) that the DPS would be at very high risk of extinction

with little chance for recovery” (Seminoff *et al.*, 2015). The Status Review Team did not consider the potential loss of ESA protections (i.e., potential determination not to list a DPS) in their analyses. They incorporated all information and analyses into the Status Review Report.

We reviewed the Status Review Report and concluded that it provided the best available scientific and commercial data on the identification of DPSs, demographic parameters, and section 4(a)(1) factors, with two exceptions. First, in evaluating the extinction risk of a DPS, we cannot assume the retention of ESA protections, which would no longer apply if a DPS was not listed under the ESA. Second, the critical risk threshold (i.e., quasi-extinction) does not directly correlate with the ESA definitions of “endangered” and “threatened” because it requires a condition worse than endangered (i.e., “very high risk of extinction”) and essentially precludes recovery (i.e., “little chance for recovery”). The latter is contrary to the fundamental purpose of the ESA, which is to conserve threatened and endangered species. Section 3 of the ESA defines conservation as “to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the ESA] are no longer necessary” (16 U.S.C. 1532); our implementing regulations add “i.e., the species is recovered” (50 CFR 424.02). Therefore, we did not use the critical risk threshold to make our listing determinations.

To make the listing determinations, we used the best available scientific and commercial data on the green turtle, which are summarized in the Status Review Report and incorporated herein. We applied information from the Status Review Report on the

identification of DPSs, demographic parameters, and section 4(a)(1) factors, but we did not apply the critical risk threshold. Instead, we directly evaluated the section 4(a)(1) factors in the context of the demographic parameters and considered the potential loss of ESA protections that would result if we did not list a DPS as threatened or endangered under the ESA. After considering conservation efforts by States and foreign nations to protect the DPS, as required under section 4(b)(1)(A), we proposed listing determinations based on the statutory definitions of endangered and threatened species (80 FR 15271, March 23, 2015). To make our final listing determinations, we reviewed all information provided during the 6-month public comment period and additional scientific and commercial data that became available since the publication of the proposed rule. However, this additional information merely supplemented, and did not differ significantly from, the information presented in the proposed rule. We received no significant new information that would cause us to change our listing determinations. With this rule, we finalize our proposed listing determinations.

### **Summary of Comments**

We solicited comments on the proposed rule from all interested parties (80 FR 15271, March 23, 2015). Specifically, we requested information regarding: (1) historical and current population status and trends; (2) historical and current distribution; (3) migratory movements and behavior; (4) genetic population structure; (5) current or planned activities that may adversely affect green turtles; (6) conservation efforts to protect green turtles; and (7) our extinction risk analysis and findings. We considered all comments received, which included 905 comments from the public, government



agencies, the scientific community, industry, and environmental organizations. The majority of comments (over 800) expressed support for the proposed listings. Some commenters requested that all DPSs be listed as endangered, and some commenters disagreed with the proposed status of one or more DPSs. We summarize all comments below by first addressing topics that apply to multiple DPSs; we then address comments specific to a particular DPS.

*Comments on Topics that Apply to Multiple DPSs*

*Comment 1:* We received several comments regarding public engagement. We received several requests for public hearings in Hawai‘i, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and American Samoa. One commenter stated that there has been inadequate public engagement.

*Response:* We held public hearings in Hawai‘i, Guam, CNMI, and American Samoa, exceeding our regulatory obligation of holding at least one public hearing (50 CFR 424.16(c)(1)). Further, we encouraged maximum public participation by extending the 90-day public comment period three times, for a total of 6 months. We made all relevant information (both as to the substance of the proposed rule and opportunities for public participation) available on our webpages, notified the petitioner via phone and email, provided informational meetings via internet and telephone (i.e., “webinars”), and addressed questions on the proposed rule via phone and email. We have thus facilitated considerable public engagement, which has been sufficient to inform our final determinations.

*Comment 2:* We received several comments on our approach for identifying

DPSs. One commenter stated that while the DPS concept started under the ESA, it is now used generally in the scientific literature. The commenter also asked whether alternatives were considered, such as combining the North and South Atlantic DPSs and combining Indian Ocean DPSs, for ease of application of the ESA. Two commenters requested a discussion of the potential limitations of mitochondrial DNA (mtDNA) for identifying DPSs, including limited sequencing information, maternal inheritance, and neutral genetic diversity. One commenter requested clarification on our evaluation of genetic population structure at nesting sites, and one commenter asked where green turtles mate. One commenter agreed with the designations, stating that the designation of DPSs has little potential for negative consequences, whereas the over-generalized species listing will continue to yield non-individualized conservation methods and runs the risk of greater population losses. One commenter provided additional scientific information in support of the DPSs; the commenter stated that the DPSs may require reevaluation in the future as new information becomes available.

*Response:* For a detailed explanation of the application of our DPS policy to the green turtle, please see the Status Review Report and proposed rule. We provide a short summary in the previous section entitled, *Listing Determinations under the ESA*.

Though the term “distinct population segment” may be used generally in the scientific literature, our use of the term throughout the proposed and final rules refers to the legal term, “distinct population segment,” as used specifically in the statute and our binding policy, which we promulgated after reviewing public comment (16 U.S.C. 1532 (16); 61 FR 4722, February 7, 1996). The Status Review Team considered other potential

DPSs, including 17 regional management units identified by Wallace *et al.* (2010); however, the criteria for those management units differed from those outlined under our DPS policy (61 FR 4722, February 7, 1996). We did not combine or separate DPSs to facilitate application of the ESA because we concluded it was more important to retain a consistent approach to all DPSs. We agree that the identification of DPSs will allow us to provide the most appropriate and effective conservation strategy for each DPS; however, Congress instructs us to exercise our authority with regard to DPSs “sparingly and only when the biological evidence indicates that such action is warranted” (S. Rept. 96-151 (1979)).

Our DPS policy requires a DPS be “discrete” and “significant” (61 FR 4722, February 7, 1996). To evaluate discreteness, the Status Review Team considered tagging and telemetry, morphology, oceanographic and ecological features, and genetic data. The genetic data included previously published studies of biparentally (nuclear DNA) and maternally (mtDNA) inherited neutral genetic markers (Seminoff *et al.*, 2015). In addition, the Status Review Team considered a global phylogenetic analysis based on nearly 400 base pairs of mtDNA sequence data from approximately 4,400 turtles sampled at 105 nesting sites (Jensen and Dutton, NMFS, unpublished data; M. Jensen, National Research Council (NRC), pers. comm., 2013). Samples collected at nesting sites provided the best available data due to plentitude (i.e., samples are often collected during nesting site surveys) and relevance, i.e., the species is somewhat organized around these sites, with females (and to a lesser extent males) returning to the waters off their natal beaches to mate (Balazs, 1980; Dizon and Balazs, 1982; Bowen *et al.*, 1992; Karl *et al.*, 1992).

Though mtDNA data do not reflect male-mediated gene flow, and additional sequencing may provide increased resolution in some cases (e.g., Dutton *et al.*, 2014b), they remain the best available scientific data to detect marked genetic separation (i.e., discreteness) among population segments throughout the range of the species.

The Status Review Team also considered the significance of the population segment to the species. Each DPS was determined to be significant because of its unique ecological setting or because its loss would result in a significant gap in the range of the species. In addition, some DPSs differed markedly from others in their genetic characteristics, likely due to exposure to different selective pressures and generations of reproductive isolation.

We reviewed, considered, and incorporated as appropriate scientific and commercial data that were not previously included in the Status Review Report or proposed rule; however, this additional information did not change our identification of any DPS. Scientific or commercial data that become available after the publication of this rule will be reviewed at a later date as appropriate (e.g., during a 5-year review).

*Comment 3:* We received several comments regarding the general process for making our listing determinations. One commenter asked why some DPSs were proposed to be listed as endangered and others as threatened. Some commenters stated that DPSs should be delisted or listed as threatened (rather than endangered) to reward conservation efforts. Several commenters asked why we did not use the population viability analyses (PVAs) or critical risk threshold from the Status Review Report. One commenter stated that the listing determinations must be based on the best available science, including the

information provided in the Status Review Report and any additional information available. One commenter inquired about our approach to uncertainty when making our listing determinations.

*Response:* Please see the previous section entitled, *Listing Determinations under the ESA*, which describes the listing process, the difference between endangered and threatened species, the sources of the best available data, and the reasons that we did not apply the critical risk threshold. Regarding the comment that DPSs should be delisted or listed as threatened to reward conservation efforts, the ESA requires us to base our listing determinations solely on the best available scientific and commercial data, after taking into account efforts to protect species (16 U.S.C. 1533(b)(1)(A)). We review conservation efforts, as required under the statute, to determine whether they will be implemented and effective in ameliorating threats to the species. While the existence of such efforts can avoid the need for an ESA listing, that determination is based on whether the best available data allow us to conclude that those efforts improve the status of the species, not on whether a party should be “rewarded” for their efforts.

We used information from the Status Review Report on the demographic parameters and section 4(a)(1) factors to make our listing determinations. The Status Review Team used PVAs as one component in the consideration of population trends (i.e., one of the demographic parameters). They performed PVAs on nesting sites if adequate data were available; therefore, the results did not apply to the entire DPS, and PVAs were not available for all DPSs. The required assumptions of the PVAs (i.e., constant environmental and anthropogenic pressures) are not likely to be met. The PVAs

did not incorporate the section 4(a)(1) factors, including climate change, or the potential loss of ESA protections. For these reasons, we did not base our listing determinations on the PVAs; however, we included the PVAs as one measure of trends when considering the demographic parameters.

Regarding our treatment of uncertainty, it is important to note that the best available scientific and commercial data are not required to be free from uncertainty. We identified uncertainties in the demographic parameters and section 4(a)(1) factors throughout the proposed rule. Nevertheless, we did not base any listing determination solely on uncertain demographic parameters or section 4(a)(1) factors.

*Comment 4:* We received several comments on demographic parameters. One commenter asked us to define “low” total nester abundance. Several commenters stated that they observe more foraging or in-water green turtles, now compared with previous years.

*Response:* Our demographic parameters include the total nester abundance, as described in the Status Review Report. Total nester abundance ranges from an estimated 404 to 992 nesting females for the Mediterranean DPS to an estimated 167,424 nesting females for the North Atlantic DPS. As a general guide, we considered total nester abundance to be low if there were fewer than 10,000 nesting females. Total nester abundance provides one measure of resilience. All else being equal, small populations are at greater risk of extinction than large populations primarily because of depensation, deterministic density effects, environmental variation, genetic processes, demographic stochasticity, ecological feedback, and catastrophes (McElhany *et al.*, 2000).

The estimates of total nester abundance and trends were based on quantitative surveys at nesting beaches; however, qualitative data on nesting sites were provided for each DPS. To evaluate the demographic parameters, the Status Review Team did not rely on qualitative estimates of abundance at foraging habitats or other areas. Such areas often include many juvenile turtles, which are characterized by lower survival rates relative to adults (Halley *et al.*, in review) and are less likely to contribute to population productivity (i.e., resilience). Furthermore, observational data are often subject to bias based on the observer's prior experience. Population declines in many DPSs occurred decades or centuries ago. Under this shifting baseline, an observer may conclude that there are "more" turtles relative to their earlier, personal observations of the depleted population (i.e., prior to conservation efforts); however, this conclusion likely underestimates the population's pre-exploitation abundance (Pauly 1995; Bowen and Avise, 1995; Jackson 1997; Bjorndal *et al.*, 1999; McClenachan *et al.*, 2006; Kittinger *et al.*, 2013). For these reasons, we conclude that the quantitative surveys at nesting beaches provide the best available scientific data to assess abundance and resilience for each DPS.

*Comment 5:* Two commenters stated that U.S. sea turtle population assessments rely too heavily on estimates of nesting females, citing the Assessment of Sea Turtle Status and Trends (NRC, 2010).

*Response:* The Status Review Team evaluated the section 4(a)(1) factors throughout the range of each DPS, including at nesting beaches, foraging areas, migratory corridors, and developmental habitats. To evaluate demographic parameters, the Status Review Team used total nester abundance and nesting trends, which are the

best available scientific data and most relevant to the resilience of a DPS, as described in the response to *Comment 4*. Though the NRC report recommends collecting data at life stages “in addition to adult females” (NRC, 2010), the ESA requires us to base our listing determinations on the best available scientific and commercial data, a standard which does not require the collection of new data. As explained above, we have determined that data on nesting females are the best available scientific data.

*Comment 6:* We received many general comments on our analyses of the section 4(a)(1) factors. Many commenters stated that Fibropapillomatosis (FP) presents a large, and in some DPSs increasing, threat; however, two commenters stated that FP does not pose a threat to green turtles. One commenter requested that we distinguish between native and non-native predators. One commenter indicated that we did not give enough weight to unusual mortality events (UMEs), explaining that it would take only one algal bloom, oil spill, or other event to kill hundreds or thousands of turtles in a short period of time. One commenter indicated that we needed to make our oceans safer for turtles by eliminating longline fishing, banning plastics, and enforcing harassment and litter laws on beaches. One commenter identified snorkelers and divers as an additional threat to sea turtles directly or indirectly via threats to coral or seagrass (Meadows, 2004; Landry and Taggart, 2010). One commenter provided additional scientific information in support of our analyses of the section 4(a)(1) factors.

*Response:* The following response applies to general comments on the section 4(a)(1) factors for all DPSs; however, please see *Comments 7* and *8* for our responses regarding general comments on harvest and climate change, respectively. We reviewed,



considered, and incorporated as appropriate scientific and commercial data that was not previously included in the Status Review Report or proposed rule.

The ESA requires us to determine whether any species is endangered or threatened because of any one or a combination of the section 4(a)(1) factors, including disease or predation (16 U.S.C. 1533 (a)(1)(C)). It does not distinguish between native or non-native predators; however, we included this information where available. FP is a disease that causes tumors in sea turtles. In 2015, NMFS hosted the International Summit on Fibropapillomatosis of Marine Turtles: Global Status, Trends, and Population Impacts. NMFS (in progress) summarized the current state of FP knowledge and concluded that FP has population level impacts because it generally results in reduced survivorship; however, some turtles recover from FP (Hirama, 2001; Hirama and Ehrhart, 2007). Therefore, we included FP in our analyses of section 4(a)(1) factors and considered the best available data on the incidence and expression of the disease for each DPS.

We considered the inadequacy of existing regulatory mechanisms for each DPS. For some DPSs, this included identification of inadequate harassment and pollution laws, due to lack of implementation and enforcement.

We evaluated other natural or manmade factors that affect the DPSs' continued existence. Plastics and other discarded materials (i.e., marine debris) often entangle or are ingested by green turtles (e.g., Schuyler *et al.*, 2014) and are a significant source of mortality in some DPSs. We considered algal blooms, oil spills, and cold stunning, which may result in UMEs. The impact of a UME is often dependent on the demographic factors of the DPS. For example, the North Atlantic DPS, with its high abundance and

increasing trends, has exhibited resilience during recent UMEs caused by cold stunning (Seminoff *et al.*, 2015). In response to the public comment, we considered the potential impacts of snorkelers, which may damage coral reefs or seagrass beds (Landry and Taggart, 2010), cause green turtles to surface more frequently (Meadows, 2004), or alter turtles' foraging success; however, we are not aware of information demonstrating population-level impacts, which are likely to be small.

In summary, we considered each of the section 4(a)(1) factors for each DPS, including disease or predation, the inadequacy of existing regulatory mechanisms, and other natural or manmade factors. The information provided on FP, predation, harassment, pollution, plastics, UMEs, and snorkelers does not represent significant new information and does not change our proposed listing determinations.

*Comment 7:* We received several comments on the harvest of turtles and eggs. Several commenters, including Senator Palacios (CNMI) and the CNMI Department of Lands and Natural Resources, requested that the Services recognize and allow cultural harvest of green turtles. Some commenters suggested farming green turtles for such purposes. Some commenters requested take exemptions similar to those for Alaskan Natives or Tribes (in regards to threatened salmon). Some commenters stated that green turtles were once used for food and traditional ceremonies in Guam, CNMI, and Hawai'i. Two commenters explained that Federal regulations prohibiting such take became effective in 1976, when CNMI became a Commonwealth of the United States (Pub. L. 94-241, 90 Stat. 263 (1976)). One commenter stated that most people in CNMI have no tolerance for the disturbance and taking of the green turtle. Several commenters opposed

harvest for any purpose, citing overexploitation as a threat.

*Response:* The take of endangered species is prohibited under section 9 of the ESA. Longstanding protective regulations apply the section 9 prohibitions to threatened sea turtles (50 CFR 17.42(b)(1); 50 CFR 223.205). These regulations remain in effect and are beyond the scope of this rulemaking. Under the ESA, “take” means 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)). The harvest of green turtles and their eggs is prohibited as “take” under the ESA and its implementing regulations. Specifically, the harvest of turtles is equivalent to hunting, and the harvest of eggs is collecting. Farming would require trapping, capturing, collecting, and eventually killing.

The ESA exempts from prohibition the take and import of endangered and threatened species for subsistence purposes by Alaskan Natives and non-native permanent residents of Alaskan native villages (16 U.S.C. 1539(e)); however, those provisions are specific to Alaskan Natives and permanent residents of Alaskan native villages. They provide no basis for authorizing take in any other context. The statute contains no other exceptions for cultural or subsistence take. Modifications to the statute to recognize additional exemptions are beyond our authority.

With respect to the longstanding regulatory provisions extending the section 9 prohibitions to threatened species of sea turtles, modifications to the existing protective regulations are beyond the scope of this rule. The scope of this rule is limited to the identification of green turtle DPSs and the determination of their listing statuses based on the best available scientific and commercial data. We have not undertaken to review or

otherwise modify the protective regulations, which remain in effect as noted in the proposed rule.

In addition to the ESA, the Inter-American Convention for the Protection and Conservation of Sea Turtles (2001) prohibits the intentional capture, retention, or killing of, and domestic trade in, sea turtles, their eggs, parts, or products. The United States is a Contracting Party to, and is therefore bound by, the treaty and required to apply the prohibitions to all persons subject to U.S. jurisdiction. The treaty does not identify exceptions for cultural take. Currently, U.S. obligations under the treaty are not implemented through separate legislation or regulations, as sea turtles are already protected under the ESA.

Historically, the harvest of green turtles and their eggs resulted in overexploitation, one of the major factors cited in the original listings of green turtles under the ESA (43 FR 32800, July 28, 1978). Green turtle populations are vulnerable to overexploitation due to slow growth rates, late sexual maturity, and complex migratory life histories (Bjorndal *et al.*, 1999). Low levels of harvest may impede local recovery (Bell *et al.*, 2007), and positive population trends are quickly reversible (Hays, 2004; Troëng and Rankin, 2005; Broderick *et al.*, 2006; McClenachan *et al.*, 2006). For each DPS, we considered the impact of legal and/or illegal harvest of turtles and eggs.

*Comment 8:* We received many comments on climate change. Most commenters stated that climate change poses a threat to green turtles. Several commenters did not agree with our evaluation of climate change and its impact on green turtle DPSs. Some stated that climate change and its resulting impacts (e.g., increases in temperature, sea

level, ocean acidification, and the frequency and intensity of storm events) are not likely to occur. One commenter stated that climate change science and predictions have limitations and uncertainties. One commenter stated that while sea level rise is likely to result in loss of nesting habitat at insular nesting beaches, it may result in the expansion of nesting habitat at continental beaches. Some commenters stated that climate change is not likely to endanger sea turtle DPSs within the foreseeable future because turtles will adapt or change their behavior. One commenter stated that the species may not be able to adapt to climate change due to its life history, the rapidly changing shoreline, and ocean pollution. One commenter requested that the Services maintain ESA protections for all green turtle DPSs due to the increasing threat of climate change, citing the unprecedented rates of greenhouse gas emissions, increased global temperatures, accelerated sea level rise, increased extreme weather events, and the effects of other threats on green turtles (e.g., fisheries bycatch and ocean pollution) magnified as a result of climate change. Two commenters stated that climate change alone, or in synergy with other factors, places DPSs in danger of extinction (i.e., endangered). One commenter provided additional scientific information in support of our climate change analyses.

*Response:* We have reviewed the best available information on climate change, including the reports submitted with comments and many recently published peer-reviewed publications and government reports on climate change and its impacts on green turtles. While we received additional information, it is not significantly different from the information reviewed for the proposed rule and supports our evaluation of climate change impacts on green turtle DPSs in the Status Review Report and proposed

rule. It does not change our proposed listing determinations. To address general comments, we provide the following summary of the best available scientific and commercial data on climate change and its impact on green turtles.

The Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations Environmental Programme and World Meteorological Organization to assess climate change and its potential environmental and socio-economic impacts. The Fifth Assessment Report (IPCC, 2014) summarizes the best available scientific knowledge relevant to climate change, considering different greenhouse gas concentration pathways (<https://www.ipcc.ch/index.htm>). The IPCC Representative Concentration Pathway 8.5 is based on increasing radiative forcing through 2100. It is based on current rates of emissions continuing into the future. We use this pathway because it requires the least assumptions (i.e., future rate changes) and, in the absence of data to the contrary, it is prudent to make resource management decisions based on *status quo* evidence. Though there is uncertainty as to the precise magnitude of future effects, there is very little uncertainty as to the fact that climate change is occurring and the direction of impacts from climate change. This is consistent with NMFS' recent coral listing determinations (79 FR 53852, September 10, 2014) and NMFS' recent Guidance for Treatment of Climate Change in NMFS ESA Decisions (NOAA Assistant Administrator for Fisheries Eileen Sobeck, Memorandum to NMFS Leadership Council, January 4, 2016; in revision). As described by the IPCC (2014), under Pathway 8.5:

- The global mean surface temperature is likely to increase 2.6 °C to 4.8 °C by 2100;

- Ocean acidification is likely to increase 100 to 109 percent by 2100;
- Global mean sea level will likely rise 0.45 to 0.82 m by 2100; sea level will very likely rise in at least 95 percent of the ocean area; approximately 70 percent of coastlines are projected to experience a sea level rise of within 20 percent of the global mean; and
- There is high confidence that warming, ocean acidification, and sea level rise will continue to increase for centuries beyond 2100.

Based on the above information, we do not agree with the commenters who state that climate change and its resulting impacts are not likely to occur. The IPCC provides conservative estimates of the effects of climate change. For example, its estimates of sea level rise represent the mean sea level rise that is likely to occur; under Pathway 8.5, the maximum is 0.98 m, and there is a 17 percent risk of exceeding that maximum (IPCC, 2014). In addition, studies published since the Fifth Assessment Report identify the potential for higher rates of sea level rise due to the destabilization of West Antarctic ice sheets (Joughin *et al.*, 2014; Rignot *et al.*, 2014; Trusel *et al.*, 2015) and volume or mass loss from other polar ice sheets (Helm *et al.*, 2014; Dutton *et al.*, 2015). Thus, the best available scientific and commercial data indicate that climate change is occurring and will continue to occur within the foreseeable future, likely resulting in increases in temperature, sea level rise, and ocean acidification.

Regarding the comment on limitations and uncertainties in climate change science, the IPCC uses qualitative descriptions of likelihood and confidence. In the Fifth Assessment Report, the term “high confidence” refers to the authors’ judgments about the

validity of findings as determined through evaluation of evidence and agreement; the term “likely” refers to a 66 to 100 percent likelihood of an outcome (IPCC, 2010). In our review of the Fifth Assessment Report, we focused on and applied outcomes and findings that were “likely” to occur and with “high confidence” findings. For example, the IPCC reports with high confidence that a large fraction of species faces increased extinction risk due to climate change during and beyond the 21st century, especially as climate change interacts with other stressors (IPCC, 2014). This conclusion is based on observational evidence that lower rates of natural climate change caused significant ecosystem shifts and species extinctions during the past millions of years, and the current changes are occurring at a faster rate over less time. The IPCC also reports with high confidence that marine organisms will face progressively lower oxygen levels and higher rates of ocean acidification and that coastal systems and low-lying areas are at risk from sea level rise (IPCC, 2014).

We agree with commenters that climate change and its impacts are a threat to green turtles. Species with high fecundity and low juvenile survival, such as sea turtles, are the most vulnerable to climate change and elevated levels of environmental variability (Cavallo *et al.*, 2015; Halley *et al.*, in review). Temperature changes and sea level rise are likely to change ocean currents and the movements of hatchlings, surface-pelagic juveniles, and adults (Hamann *et al.*, 2007; Hawkes *et al.*, 2009; Poloczanska *et al.*, 2009; Cavallo *et al.*, 2015). Though ocean acidification is likely to affect the forage-base of green turtles, including invertebrates, seagrasses, and algae, it is not clear how these changes will impact green turtles (Hamann *et al.*, 2007; Poloczanska *et al.*, 2009).



Nesting beaches are likely to be impacted by climate change. Sea level rise is likely to reduce the availability and increase the erosion rates of nesting beaches, particularly on low-lying, narrow coastal and island beaches (Fish *et al.*, 2005; Baker *et al.*, 2006; Jones *et al.*, 2007; Fuentes *et al.*, 2009; Hawkes *et al.*, 2009; Anastácio *et al.*, 2014; Pike *et al.*, 2015). On undeveloped and unarmored beaches with no landward infrastructure, a typical beach profile may maintain its configuration but will be translated landward and upward (Bruun, 1962); however, along developed coastlines, and especially in areas where erosion control structures have been constructed to limit shoreline movement, sea level rise is likely to cause severe effects on nesting females and their eggs (Hawkes *et al.*, 2009; Poloczanska *et al.*, 2009). Increased storm frequency and intensity are likely to result in altered nesting beaches and decreased egg and hatchling success (Pike and Stiner, 2007; Van Houtan and Bass, 2007; Hawkes *et al.*, 2009; Fuentes *et al.*, 2011a; Dewald and Pike, 2014; Brost *et al.*, 2015). Increasing air and sea surface temperatures are strongly correlated to sand temperatures (Fuentes *et al.*, 2009; Santos *et al.*, 2015a), which could lead to embryonic mortality at 35 °C (Ackerman, 1997) and the loss of male hatchlings at 30.3 °C (Godfrey and Mrosovsky, 2006; Fuentes *et al.*, 2010b; 2011b).

Some commenters stated that sea turtles would respond to climate change via adaptation or behavioral changes. Adaptation by natural selection occurs when individuals with one heritable trait survive and reproduce (passing that trait onto their offspring) at a higher rate than individuals with other heritable traits. It occurs over many generations, and one green turtle generation is approximately 30 years (Seminoff *et al.*, 2015). As climate change progresses (i.e., temperatures increase, ocean acidification

increases, sea level rises, and storms increase in frequency and intensity), sea turtles that nest on low-lying beaches with inhospitable sand temperatures will produce less viable offspring than previously and as compared to those nesting at higher elevations and on beaches with sand temperatures conducive to embryonic development. This adaptation scenario will have a net effect of reducing the overall abundance of sea turtle populations in the future (e.g., reduced production at the low-lying beaches and constant production at the higher elevation beaches). The capacity for green turtles to quickly adapt is questionable because they are long-lived and late maturing, and the species has previously evolved in a climate that changed at a much slower rate than projections suggest for the next 100 years (Hamann *et al.*, 2007; Hawkes *et al.*, 2009; Poloczanska *et al.*, 2009). Slow evolutionary rates (Awise *et al.*, 1992) and smaller population sizes (as a result of previous declines and relative to pre-exploitation populations; McClenachan *et al.*, 2006) may further limit the species' ability to adapt (Hawkes *et al.*, 2009). Therefore, adaptation by natural selection for green turtles is likely to be limited and may not match the rate of climate change impacts within the foreseeable future.

We agree that in response to climate change, green turtles may alter their behavior; for example, nesting females may use beaches with higher elevation or cooler sands (Santos *et al.*, 2015). However, the likelihood of altered behavior is difficult to estimate because green turtles exhibit high nesting site fidelity at some locations (Carr and Carr, 1972; Dizon and Balazs, 1982; Mortimer and Portier, 1989; Marquez, 1990; Bowen *et al.*, 1992) and low nesting site fidelity at others (Basintal 2002; Abe *et al.*, 2003). Dizon and Balazs (1982) state, "It is imperative for the well-being of the

population that no alterations in the habitat be made since once imprinted the green turtle is unlikely to switch its breeding habitat.” Santos *et al.* (2015a) conclude that no environmental condition may be important enough to deter a faithful nester. In addition, alternative nesting sites may not be available. Furthermore, coastal squeeze, where coastal development prevents the landward migration of beaches, may prevent the use of higher elevation areas (Fish *et al.*, 2008; Mazaris *et al.*, 2009), even on continental beaches. Alternative beaches may not provide the optimal substrate for nesting (Fuentes *et al.*, 2010a). Therefore, the best available scientific and commercial data indicates that green turtle nesting behavior alterations are not likely to ameliorate all effects of climate change on the species.

Our consideration of climate change includes efforts to limit future emissions and mitigate the impacts of climate change. After the publication of the proposed rule, 195 nations adopted the landmark Paris Agreement at the Twenty-First Conference of the Parties to the United Nations Framework Convention on Climate Change (the 2015 Paris Climate Conference, or COP 21). The Agreement will be open for signature for one year beginning on April 22, 2016, and will come into effect when ratified by 55 nations, representing 55% of global greenhouse gas emissions. Article 2.1 of the Agreement states that it “aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by . . . . [h]olding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels. . . .” (UNFCCC, Dec. 12, 2015, Article 2.1(a),

<http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf>). Contracting parties will design their own reduction targets (their “intended nationally determined contributions”), which are to become progressively more ambitious through successive iterations over time. The parties will be required to submit plans for achieving their intended reductions and to account for their actual performance through transparent means. *See* Articles 3 and 4. Since the Paris Agreement is not yet in force, sufficient information regarding the plans of the parties for reducing emissions and the likely impact on global greenhouse gas emissions over the foreseeable future is not yet available. At this time, on the current record, we must conclude there is no basis to examine how these recent efforts may ameliorate the likely impacts of climate change in the foreseeable future. As time progresses and more information becomes available on implementation and effectiveness of the Paris Agreement, we expect that information will be incorporated into the ongoing assessments of the IPCC, which is well-recognized to be the source of the best available scientific and commercial information on climate change trends and impacts. Our future determinations under the ESA will continue to be informed by the information available from the IPCC, as well as other available climate analyses, and thus will take into account new information as appropriate.

One study assessed possible mitigation measures, which included shading or sprinkling nests with water to reduce temperatures (Jourdan and Fuentes, 2015); however, the effectiveness of such strategies to address climate change impacts has yet to be determined and is likely to be dependent on conservation resources and site-specific characteristics.

Therefore, based on the best available scientific and commercial data, we conclude that the effects of climate change present a threat to all green turtle DPSs. While this threat alone does not put any DPS in danger of extinction, climate change together with other threats places some DPSs in danger of extinction (i.e., endangered) and makes others likely to become endangered within the foreseeable future (i.e., threatened).

*Comment 9:* Several commenters stated that DPSs proposed as endangered (i.e., the Central West and Central South Pacific DPSs) should be listed as threatened due to inadequate data. Several commenters stated that nesting estimates in the Central West and Central South Pacific DPSs are based on a limited number of survey locations. Some commenters, including the Guam Department of Agriculture, requested a 6-month extension for the publication of the final rule.

*Response:* Please see the previous section entitled, *Listing Determinations under the ESA*, which describes the listing determination process and the difference between endangered and threatened species. The ESA requires us to determine whether any species is endangered or threatened because of any one or a combination of the section 4(a)(1) factors (16 U.S.C. 1533(a)(1)) and based solely on the best available scientific and commercial data (16 U.S.C. 1533(b)(1)(A)); it does not require quantitative analyses, and it does not require us to collect new data or perform additional surveys. These requirements apply equally to endangered and threatened determinations.

Regarding the comment on the number of nesting survey locations, for each DPS we compiled the best available scientific and commercial data including peer-reviewed scientific publications, government reports, and verified unpublished data on green turtle

biology and threats. The Status Review Team and two post-doctoral researchers evaluated over 600 publications on green turtles for the Status Review Report, which was peer-reviewed by 15 scientists. To further ensure that the listing determinations are based on the best available data, we requested additional information and allowed over 6 months for response (80 FR 15271, March 23, 2015). We did not receive any new information on nesting sites in the Central West or Central South Pacific DPSs. We did not receive any information that changed the listing determination for any DPS.

Regarding the request for an extension, the ESA provides that if we find that there is substantial disagreement regarding the sufficiency or accuracy of the available data relevant to the determination, we may delay the publication of the final rule for 6 months to solicit additional data (16 U.S.C. 1533 (b)(6)(B)(i)). In this instance, we do not find that there is a substantial disagreement regarding the sufficiency or accuracy of the available data on the Central West or Central South DPSs, or for any other DPS. To the contrary, we find that the best available scientific and commercial data support our proposed listing determinations, without the need for additional data. The commenters did not identify additional information that will become available and would be fundamental to our determinations. We allowed a 6-month public comment period on the proposed rule, which exceeded the 60-day minimum as outlined in our regulations (50 CFR 424.16(c)(2)). Therefore, we find there is no basis upon which to grant the request to extend the deadline for publication of the final rule.

*Comment 10:* The Colombian Ministry of Environment and Sustainable Development provided information on the National Programme for the Conservation of

Marine and Continental Turtles in Colombia that includes education, conservation, and outreach plans; in addition, Colombia works with the Permanent Commission for the South Pacific on the Southeast Pacific Action Plan (based on the Lima Convention of 1981), which protects sea turtles and their habitats by mitigating threats through participatory strategies designed using the best available scientific and socioeconomic information. The Colombian Ministry of Environment and Sustainable Development also stated that in areas where utilization of sea turtles is deeply ingrained in the local culture, such as the La Guajira region of Colombia, changing people's attitudes about the use of sea turtles can be a long, slow process; however, these communities play a fundamental role in the conservation of sea turtles.

*Response:* We appreciate the comment and the efforts made to conserve green turtles. We added the information on conservation efforts in Colombia to the relevant sections of this notice on the South Atlantic and East Pacific DPSs.

*Comment 11:* One commenter identified several spelling mistakes, misused words, and typos.

*Response:* We corrected the spelling mistakes, misused words, and typos in the final rule.

#### *Comments on the North Atlantic DPS*

*Comment 12:* We received comments from State agencies including the Florida Fish and Wildlife Conservation Commission (FWC), the Florida Department of Environmental Protection (FDEP), the Georgia Department of Natural Resources Wildlife Resources Division, the North Carolina Wildlife Resources Commission, and

the Virginia Department of Game and Inland Fisheries (VDGIF). They supported the DPS listings. The FWC and FDEP emphasized the conservation programs currently in place in Florida. The VDGIF recommended that more emphasis be placed on nesting beaches north of Florida, such as in North Carolina, as they may become more important in the future due to climate change.

*Response:* Regarding climate change, please see our response to *Comment 8*. We appreciate the positive response from the State agencies and their continued support on listed species conservation. We considered the best available data on green turtle demographic parameters, threats, and conservation efforts for this DPS. The estimate of total nesting abundance includes the nesting sites north of Florida (Seminoff *et al.*, 2015). Nesting beaches north of the high density nesting beaches in southeast Florida may become more important to the DPS in the foreseeable future. By listing the DPS as a threatened species under the ESA, we protect all nesting green turtles, including those that nest on beaches in North Carolina.

*Comment 13:* We received many comments from the public on the listing determination of the North Atlantic DPS. Several commenters supported the listing determination. One commenter supported the listing determinations and provided information on nesting abundance in Florida and an observed increase in juvenile green turtles on the reefs off Hutchinson Island, the Central Indian River Lagoon, and the Key West National Wildlife Refuge. Many commenters stated that the DPS should be listed as endangered due to the severity of threats. Several commenters stated that turtles of the Florida breeding population, originally listed as endangered, would lose protections if



listed as threatened. One commenter referenced the high abundance of green turtles prior to commercial exploitation and identified the possible threat of harvest if ESA protections were removed. One commenter stated that the listing determination did not agree with the critical risk threshold in the Status Review Report, i.e., that the standard for extinction was lower than the statutory definition and that the horizon for foreseeable future was beyond what could reasonably be predicted. The commenter stated that the DPS is not likely to become endangered within the foreseeable future, citing population increases, PVAs, and the critical risk threshold analysis described in the Status Review Report. This commenter requested the information used to make the listing determination.

*Response:* Please see the section entitled, *Listing Determinations under the ESA*, which describes the listing process, the difference between endangered and threatened species, our explanation for using a foreseeable future of 100 years, and the reasons that we did not apply the critical risk threshold, which is a higher standard (i.e., requires a condition worse than the statutory definition of endangered). The best available scientific and commercial data allow us to make reasonable projections over that time frame as to the key threats that are impacting the species as well as the species' biological response (over three generations). The primary threats leading to listing are already operating on the species, so we are not relying solely on the ability to project effects into the future. Please see our response to *Comment 3* for the reasons that we did not base our determination on the PVAs. The information used to make the listing determination is provided in the Status Review Report, proposed rule, and final rule; these documents and the list of references cited in the proposed rule are available online at

<http://www.nmfs.noaa.gov/pr/species/turtles/green.htm>.

We do not agree with commenters who state that the North Atlantic DPS is endangered or should not be listed under the ESA. The North Atlantic DPS is not presently in danger of extinction because of its high nesting abundance, increasing trends, connectivity, and spatial diversity, which provide some resilience against the section 4(a)(1) factors. However, the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range due to the following threats: habitat degradation, harvest of turtles and eggs, disease and predation, bycatch, channel dredging, marine debris, cold stunning, and climate change. Removing ESA protections would further increase the likelihood of endangerment. The large abundance and increasing trend of nesting females are a direct result of ESA protections and State, local, and foreign protections, which are influenced by the ESA status. If we did not list the DPS under the ESA, the important protections, financial resources, and conservation benefits associated with the ESA would not continue. Further, without listing under the ESA, it is possible that some State, local, and foreign protections would be rescinded.

Regarding the comment on turtles from the Florida breeding population, the change in status (from endangered to threatened) will not reduce protections afforded under the ESA. Threatened and endangered sea turtles receive similar protections under the ESA because longstanding protective regulations apply the prohibitions of section 9 of the statute (which automatically apply to endangered species) to threatened sea turtle species (50 CFR 17.42(b)(1); 50 CFR 223.205). As discussed in the proposed rule and in a prior response, those regulations are not affected by this listing determination

rulemaking and remain in effect for threatened DPSs, such as the North Atlantic DPS. One minor change for turtles from the Florida breeding population is that, under the USFWS and FWC section 6(c)(1) agreement, any authorized employee or agent of the FWC may, when acting in the course of official duties, take or issue a conservation permit authorizing take of a green turtle for purposes consistent with the ESA and provisions of the section 6(c)(1) agreement.

*Comment 14:* One commenter stated, “To the extent that the Services take the position that they will not delist species unless specifically petitioned to do so, API [American Petroleum Institute] requests that the Services treat this letter as a delisting petition.”

*Response:* The Services do not take the position “that they will not delist a species unless specifically petitioned to do so.” As discussed in the proposed rule, we initiated a status review of the entire species to comprehensively identify DPSs and determine their appropriate listing status, including whether any DPSs no longer warrant listing. Thus, with or without a petition directed at any particular DPS, we used the best available scientific and commercial data (including comments submitted on the proposed rule) to make appropriate ESA listing determinations for each DPS. Stated differently, filing of such a petition at this time would not trigger consideration of new issues that are not already being thoroughly evaluated as part of the ongoing rulemaking. We considered the information presented in API’s comment letter fully when making our final listing determinations. It is thus unnecessary by the commenter’s own terms to consider the comment as a petition.

We find that the purported petition fails to constitute a valid petition for three additional reasons. First, were the Services to process comments on a proposed rule as petitions seeking to determine the status of the species already the subject of the proposed rule, it would create a circular and redundant process. When a petition is filed, the Services must make a 90-day finding to the maximum extent practicable, and if that initial finding is positive, it triggers a status review and ultimately a 12-month determination (50 CFR 424.14(b)(3)). If the relevant status review has already been conducted and a proposed rule to determine the status of the affected species is available for comment, there is nothing more that processing a new petition at that time could accomplish. Second, API's letter can be read as attempting to petition the Services to delist the North Atlantic DPS before the rule to list it as such has become a final agency action. To the extent that was the commenter's intent, such a preemptive petition is improper as it does not seek an action that can be presently taken. Finally, we note that our regulations require that every petition clearly identify itself as such (50 CFR 424.14(a)), a requirement not clearly met where the document is self-described as a comment letter filed within the context of an ongoing, docketed proceeding.

*Comment 15:* We received many comments on the section 4(a)(1) factors for the North Atlantic DPS. Though commenters generally agreed with our identification of threats, several disagreed with our analyses of these threats. One commenter provided information on the threats of climate change, fisheries bycatch, pollution, direct harvest, disease, and the inadequacy of existing regulatory mechanisms, to provide further support for our determination and the need to continue protection under the ESA without any

weakening of regulations. Several commenters stated that green turtles are especially sensitive to habitat destruction at nesting sites as a result of coastal development, artificial lighting, and beach nourishment projects and in water as a result of eutrophication, pollution, and harmful algal blooms. One commenter stated that poaching is a major threat in the North Atlantic DPS. Several commenters stated that the DPS should be considered endangered as a result of the high incidence of FP in green turtles found in Florida and the spread of the disease geographically (from central and southern Florida to northeast and northwest Florida) and in incidence. One commenter stated that “from 1980-2005, 22.2 percent of stranded green sea turtles were afflicted; last year, 28.7 percent of all green sea turtles were afflicted.” Several commenters stressed the importance of increasing threats, such as FP, climate change, marine debris, bycatch, and boat strikes. Several commenters stated that climate change should be considered a significant threat for the North Atlantic DPS, and the listing status for Florida green turtles should remain as endangered based on this threat. One commenter stated that green turtles are especially sensitive to sea level rise, because they prefer to nest on narrower, steeper, and eroded beaches. They stated that the combination of coastal development and sea level rise could be devastating to the DPS; however, the removal of structures such as seawalls and buildings might mitigate such effects. One commenter stated that the long-term effects of the *Deepwater Horizon* oil spill (Mississippi Canyon 252) remain to be seen. One commenter stated that the North Atlantic DPS is not exposed to any threats that warrant its listing as threatened under the ESA. The commenter stated that the amount of coastal armoring permits in Florida has decreased between 2001 and

2005, protection has increased in other countries, artificial lighting is controlled by local lighting ordinances, and sea level rise is not considered an imminent threat. The commenter stated that impacts from armoring are offset by beach nourishment programs that place sand on eroding beaches, increasing green turtle nesting habitat.

*Response:* For our general responses regarding the section 4(a)(1) factors, please see *Comments 6, 7, and 8*. We list the North Atlantic DPS as threatened because of habitat destruction and modification, the harvest of turtles and eggs, disease and predation, inadequate regulatory mechanisms, bycatch, channel dredging, marine debris, cold stunning, and climate change. Based on our review of the best available scientific and commercial data, the DPS is not presently in danger of extinction due to a single factor (e.g., FP or climate change) or the section 4(a)(1) factors cumulatively, when considered in the context of the demographic parameters (i.e., high abundance, increasing trends, and spatial diversity), which provide resilience to the DPS at present. While a species may be listed based on any one of the five factors, in many instances, more than one factor may cause the species to meet the definition of a threatened or endangered species. Alternatively, while each individual factor may not cause the species to meet the definition of threatened or endangered, the cumulative effect of multiple factors may cause the species to be listed.

Regarding the comments on FP, the disease results in internal and/or external tumors that may grow large enough to hamper swimming, vision, feeding, and potential escape from predators. We acknowledge the increasing distribution and incidence of FP, particularly in Florida. The threat is likely to increase, given the continuing, and possibly

increasing, human impacts to, and eutrophication of, coastal marine ecosystems that may promote this disease (NMFS, in progress). However, FP is not always lethal, and photographic evidence from Florida shows that the tumors on some green turtles go into regression (Hirama, 2001; Hirama and Ehrhart, 2007; NMFS, in progress).

Regarding the comments on habitat destruction and protection, we considered habitat modification and destruction impacts to the extent they are known and based on the best available data, including qualitative information (i.e., the ESA does not require quantitative data, which in this case are limited). There has been an increase in coastal armoring structures permitted by the FDEP over the last 5 years particularly on Singer Island in Palm Beach County, a high density nesting beach. In many areas, residential and commercial properties, as well as breakwaters, jetties, seawalls, and other erosion control structures designed to protect public and private property, continue to be permitted and built. Such coastal development places increasing pressure on beach systems and negatively affects nesting habitat. While mitigation measures (e.g., lighting ordinances and construction setbacks) provide important protections, they do not remove the threats or reduce them to insignificant levels. Beach nourishment programs can provide nesting habitat where it had been previously destroyed or offset impacts from other coastal measures; however, they also alter sand characteristics and nearshore foraging habitat. At best, such programs help to reduce impacts but do not provide new benefits to the turtles.

Regarding the comment on poaching, as explained in more detail in the Status Review Report, the harvest of turtles and eggs remains legal in several countries within

the range of the North Atlantic DPS. Turtles are legally and illegally harvested in foraging areas. Eggs are harvested at many nesting beaches.

Regarding the comment on the *Deepwater Horizon* oil spill, we agree that the long-term effects remain to be seen because the spill was particularly harmful to post-hatchlings and surface-pelagic juveniles (Witherington *et al.*, 2012) by temporarily destroying their *Sargassum* habitat (Powers *et al.*, 2013) and resulting in the ingestion of contaminants.

Numerous other natural and manmade factors affect the continued existence of this DPS. Regulatory mechanisms contained within international instruments are inconsistent and likely to be insufficient. While some regulatory mechanisms should address direct and incidental take for this DPS, it is unclear to what extent such measures are implemented and effective. The species is conservation-dependent and positive population trends are likely to be curtailed or reversed without alternate mechanisms in place to continue existing conservation efforts and protections afforded under the ESA. We conclude that the North Atlantic DPS is threatened by the above section 4(a)(1) factors.

*Comment 16:* Several commenters supported an endangered listing determination for the North Atlantic DPS, citing the criteria in the Recovery Plan for the U.S. Population of Atlantic Green Turtle (NMFS and USFWS, 1991); however, one commenter cited the criteria in the Recovery Plan as a basis for delisting the North Atlantic DPS.

*Response:* The ESA requires us to determine whether a species is threatened or



endangered because of the 4(a)(1) factors, based solely on the best available data after considering conservation efforts. Section 4(f)(1) requires us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless the Secretary finds that such a plan will not promote the conservation of the species (16 U.S.C. 1533(f)(1)). The information included in such plans informs but does not dictate listing determinations. *See Friends of Blackwater v. Salazar*, 691 F.3d 428 (D.C. Cir. 2012).

The 1991 Recovery Plan was written prior to the identification of the DPS and only applies to the U.S. population of the Atlantic green turtle (whereas the North Atlantic DPS includes foreign populations and does not include turtles nesting in the U.S. Virgin Islands). The 1991 Recovery Plan identifies recovery criteria (NMFS and USFWS, 1991); however, these criteria apply to delisting, not to changes in listing status (i.e., from endangered to threatened). Some, but not all, of the recovery criteria for this population have been met. Nesting in Florida averages over 14,000 nests annually for the last 6 years (<http://myfwc.com/media/2988445/greenturtlenestingdata10-14.pdf>; FWC, pers. comm., 2015); however, less than 25 percent of all available nesting beaches and less than 50 percent of nesting activity are in public ownership. Similarly, the species' status in nearshore and inshore waters and reduction in stage class mortality have not been evaluated.

To make our listing determination, we evaluated the section 4(a)(1) factors in the context of the demographic parameters for this DPS (i.e., we did not directly evaluate whether the U.S. Atlantic population has met the recovery criteria). Based on the best

available scientific and commercial data, we conclude that the North Atlantic DPS is not presently in danger of extinction but is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (i.e., threatened under the ESA) because of habitat destruction and modification, the harvest of turtles and eggs, disease and predation, inadequate regulatory mechanisms, bycatch, channel dredging, marine debris, cold stunning, and climate change.

*Comments on the Mediterranean DPS*

*Comment 17:* One commenter requested a discussion of the threat from wars in Syria and Libya.

*Response:* Green turtles nest on Syrian beaches and forage in the waters off Libya; there is a migratory corridor between these nesting and foraging hotspots (Stokes *et al.*, 2015). Stokes *et al.* (2015) tracked 34 turtles from Cyprus, Turkey, Israel, and Syria; over half of the turtles migrated to the Gulf of Sirte and the Gulf of Bomba in Libya. The Gulf of Bomba and nearby Ain Gazala have been identified as potential marine protected areas (Badalamenti *et al.*, 2011); the authors also recommend the Gulf of Sirte for consideration as a marine protected area (Stokes *et al.*, 2015). As summarized by Stokes *et al.* (2015), much of Libya's coastline is not degraded and is relatively unpopulated; total fisheries catch is an order of magnitude lower than that of neighboring Egypt and Tunisia. Marine exploitation has increased, however, and conservation efforts have been delayed by political unrest (Badalamenti *et al.*, 2011). Geopolitical instability further complicates conservation efforts (Katsanevakis *et al.*, 2015). In an interview on the Stokes *et al.* (2015) findings, B.J. Godley indicated that political instability can have

positive (by slowing exploitation and development and creating de-facto wildlife refuges) and negative (by delaying the identification of marine protected areas) effects on conservation (Gertz, 2015; <http://www.takepart.com/article/2015/02/14/endangered-green-turtle-mediterranean-libya>). Because of the possibility of positive and negative effects, and without specific information on the likely impacts on green turtles, we cannot determine how such conflicts are likely to impact the Mediterranean DPS. In any case, we proposed to list this DPS as an endangered species, and such information would not change our listing determination.

*Comments on the South Atlantic DPS*

*Comment 18:* One commenter suggested combining the North and South Atlantic DPSs; however, another commenter stated that the separation of the North and South Atlantic DPSs is supported by recent studies (Putman and Naro-Maciel, 2013; Naro-Maciel *et al.*, 2014b). The United Kingdom (UK) Department for Environment, Food, and Rural Affairs supported the threatened status of the South Atlantic DPS but provided the following information about the Ascension Island nesting site: the best available data on the Ascension Island population is provided by Weber *et al.* (2014); the average size of nesting females declined from a mean carapace length of 116.0 cm in 1973-1974 to 111.5 cm in 2012 (Weber *et al.*, 2014); and predation by feral dogs and especially cats, which were eradicated in 2004, is no longer a significant source of mortality for hatchlings. One commenter stated that fewer than 10 green turtles nest on monitored index beaches annually in Dominica and that these numbers are lower than a generation ago due to poaching of turtles and eggs. One commenter suggested renaming the South

Atlantic DPS because its boundary occurs north of the equator.

*Response:* We appreciate the comments from the UK Department for Environment, Food, and Rural Affairs and their efforts to conserve green turtles. We reviewed and evaluated the information on turtles at Ascension Island and Dominica and determined that it does not change the proposed listing determination for the South Atlantic DPS.

Regarding the suggestion to combine the North and South Atlantic DPSs, the best available scientific and commercial data support the identification of the North and South Atlantic DPSs. Genetic, tagging, tracking, and modeling studies support the discreteness of the North and South Atlantic DPSs (Baudouin *et al.*, 2015; Seminoff *et al.*, 2015). In addition to the information provided in the Status Review Report, nuclear (microsatellite) and mtDNA analyses reveal a strong, ancient barrier to dispersal between northern and southern Atlantic green turtles (Naro-Maciel *et al.*, 2014b), as divided by our definition of the North and South Atlantic DPSs (i.e., the equator lies south of and does not coincide with the genetic barrier). The breeding seasons of the DPSs are temporally distinct, potentially limiting mixing during reproductive migrations (Naro-Maciel *et al.*, 2014b). Ocean circulation models (i.e., a potential proxy of juvenile turtles, though see Putman and Mansfield, 2015) indicate that the majority of particles arising from the northern or southern Atlantic are likely to remain within the northern or southern Atlantic, respectively (Putman and Naro-Maciel, 2013).

Regarding the suggestion to rename the South Atlantic DPS, the vast majority of the range of the South Atlantic DPS lies in the South Atlantic Ocean. We find that the

nomenclature appropriately distinguishes this DPS from the North Atlantic DPS and is consistent with the terminology used to name all DPSs.

*Comments on the Southwest Indian DPS*

*Comment 19:* The UK Department for Environment, Food, and Rural Affairs provided additional information on the British Indian Ocean Territory (BIOT), which occurs within the range of the Southwest Indian DPS, stating that: (1) available information on nesting turtles within the BIOT includes “only fairly crude assessments of population size and seasonality,” while satellite data indicate movement throughout the Indian Ocean; and (2) it is highly unlikely that, given its isolation, the BIOT nesting population would be supplemented by immigrants from elsewhere. The Department for Environment, Food, and Rural Affairs recommends waiting for additional census data before considering whether to downgrade the conservation status of these sea turtles. The Embassy of the Republic of Mauritius agreed with the proposed listing.

*Response:* We appreciate the comments from the UK Department for Environment, Food, and Rural Affairs and the Embassy of the Republic of Mauritius and their efforts to conserve green turtles. The status for this DPS has not been changed; we listed the species as threatened in 1976 and now list the Southwest Indian DPS as threatened under the ESA. The ESA requires us to base our listing determinations on the best scientific and commercial data available, after conducting a review of the status of the species and considering conservation efforts (16 U.S.C. 1533(b)(1)(A)). Because we have sufficient data to determine the listing status of this DPS and did not receive additional data during the 6-month comment period on the proposed rule, there is no

basis to delay our determination while additional census data are collected.

The Status Review Team considered the BIOT, which includes the seven atolls of the Chagos Archipelago, where sea turtle nesting is common (Mortimer and Day, 1999). The estimated total nester abundance of 1,800 nesting females (Seminoff *et al.*, 2015) was based on the Mortimer and Day (1999) estimate of 400 to 800 females nesting annually at the Chagos Archipelago, which we consider to be the best available scientific and commercial data. Mortimer and Day (1999) state that green turtles and their habitat are well protected by the BIOT administration; however, monitoring and conservation efforts are not sufficient to adequately reduce all threats.

*Comments on the East Indian-West Pacific DPS*

*Comment 20:* The Forestry Bureau of the Taipei Economic and Cultural Representative Office agrees with the listing under the ESA.

*Response:* We appreciate the comment from the Forestry Bureau of the Taipei Economic and Cultural Representative Office and their efforts to conserve green turtles.

*Comments on the Central West Pacific DPS*

*Comment 21:* We received several comments on the section 4(a)(1) factors for the Central West Pacific DPS. One commenter stated that human populations in Guam, CNMI, and the Federated States of Micronesia are decreasing. One commenter stated that development is not a threat. Several commenters stated that poaching of nesting turtles is a problem in the Central West Pacific DPS; one commenter stated that allowing cultural take would resolve this issue, though another disagreed. One commenter stated that bycatch is a threat in CNMI. One commenter stated that 4,000 years ago, sea level was

1.8 m higher than it is today in CNMI (Amesbury, 2007), and one commenter stated that sea level rise is not a threat.

*Response:* Regarding cultural take, please see our response to *Comment 7*. The harvest of sea turtles or their eggs is illegal under the ESA and its regulations, the Inter-American Convention for the Protection and Conservation of Sea Turtles, and local laws in CNMI (CNMI Public Law 02-51 1981) and Guam (Endangered Species Act of Guam, 1979). Despite these protections, poaching occurs in CNMI (CNMI-DLNR 2006-2009, 2011, 2013; Summers *et al.*, in progress) and Guam ([http://www.noaanews.noaa.gov/stories2008/20080729\\_seaturtle.html](http://www.noaanews.noaa.gov/stories2008/20080729_seaturtle.html); <http://dawr.guam.gov/wildlife/sea-turtles/>). The best available data indicate that past poaching and harvest have led to the low nesting abundance of the Central West Pacific DPS, whereas the protection of turtles and their habitat has led to recent increases in foraging turtles (Martin *et al.*, 2016). Based on the demographic parameters of the DPS, including its low nesting abundance, we conclude that it has little resilience against threats, especially those that remove turtles from the population, such as poaching and the harvest of turtles and eggs. Bycatch in subsistence and small-scale commercial fishing operations is also a concern.

Regarding the comments on development and human population size, threats to nesting beaches include construction (and associated lighting), military activities, public use of beaches, and beach driving (NMFS and USFWS, 1998; CNMI Coastal Resources Management Office, 2011; Palacios, 2012; Wusstig, 2012). Coastal erosion has been identified as a high risk in the CNMI due to the existence of concentrated human

population centers near erosion-prone zones; it is likely to be exacerbated by sea level rise (CNMI Coastal Resources Management Office, 2011). In Guam, turtle densities are highest where there are healthy coral reefs and seagrass beds, low human densities, and marine protected areas (Martin *et al.*, 2016). Though human population density is correlated with turtle density, our major concern is with coastal development and the resulting degradation of nesting beaches and foraging areas. Human populations in Guam, CNMI, and the Federated States of Micronesia have increased since the listing of the green turtle in 1976. Since 2000, human populations have increased in Guam and decreased in CNMI and the Federated States of Micronesia (World Bank, 2015; [https://www.census.gov/newsroom/releases/archives/2010\\_census/cb11-cn179.html](https://www.census.gov/newsroom/releases/archives/2010_census/cb11-cn179.html)).

Regarding the comments on sea level rise, sea level changes have occurred throughout the history of the species (e.g., Grant *et al.*, 2012), but rarely at the rate likely to occur as a result of anthropogenic climate change (IPCC, 2014). Furthermore, sea level rise did not occur in the presence of other threats, such as unprecedented ocean acidification (Honisch *et al.*, 2012), overexploitation, fisheries bycatch, and habitat degradation due to coastal development, pollution, and other anthropogenic causes. Additionally, the effects of sea level rise are likely to be exacerbated by the increased frequency and intensity of storm events (IPCC, 2014). As described by Summers *et al.* (in progress), water inundation and accompanying erosion from tropical storms, typhoons, and storm water drainage impacted 7.5 percent of inventoried Saipan nests (N = 160) between 2007 and 2013. We expect increases in the rate of such impacts within the foreseeable future.



We conclude that the Central West Pacific DPS is endangered by a combination of section 4(a)(1) factors.

*Comment 22:* We received several comments on the listing determination for the Central West Pacific DPS. Senator Palacios (CNMI) stated that though NMFS supports a contractor to perform research on green turtles in CNMI, resources for data collection are insufficient. Some commenters stated that data are limited and lacking quantitative analyses and that they often observe in-water sea turtles (though another commenter never sees sea turtles). The Guam Department of Agriculture suggests listing the DPS as threatened due to data limitations (including limited survey effort) and naturally low abundances; the Guam Department of Agriculture also requests information on whether nations within the range of the Central West Pacific DPS were contacted, how the endangered listing would solidify protection of the species, and whether the recovery plan will be updated. The CNMI Department of Lands and Natural Resources provided comments on the many in-water turtles around Tinian, suggested the possibility of nesting in the northern islands, and disagreed with the endangered listing status because it might increase the extinction risk and hinder recovery (though another commenter did not agree with this assessment and did not understand how the harvest of turtles for cultural reasons would result in conservation) and further reduce the possibility of cultural harvest.

*Response:* Please see our responses to *Comment 3* (regarding turtle observations), *Comment 7* (regarding cultural harvest), and *Comment 9* (regarding perceived data limitations).

Regarding the comments on data, to make our proposed listing determination, we evaluated the best available scientific and commercial data, which included information from several surveys (NMFS and USFWS, 1998; Bureau of Marine Resources, 2005; Barr, 2006; Palau Bureau of Marine Resources, 2008; Trevor, 2009; Maison *et al.*, 2010; H. Suganuma, Everlasting Nature of Asia, pers. comm., 2012; J. Cruce, Ocean Society, pers. comm., 2013). For our final listing determination, we also reviewed additional surveys, which did not provide significant new information or change our listing determination (Kolinski *et al.*, 2001; Kolinski *et al.*, 2004; Kolinski *et al.*, 2005; Kolinski *et al.*, 2006; Jones and Van Houtan, 2014; Martin *et al.*, 2016; Summers *et al.*, in progress). We conclude that data on nesting turtles (rather than foraging turtles, as discussed in comments and at public hearings) provide the best available scientific and commercial data for assessing resilience.

Regarding the suggestion to list the DPS as threatened, based on the best available scientific and commercial data, we find the species to be in danger of extinction throughout all or a portion of its range as a result of the present and threatened modification of its habitat, poaching of turtles and eggs, disease and predation, fisheries bycatch, marine debris, and climate change. Regulatory mechanisms and conservation efforts are inadequate to remove the impact of these threats, and the DPS has little resilience to such threats due to its low nesting abundance and limited nesting site diversity.

Regarding the comment on naturally low abundance and the possibility of additional nesting sites, the low nesting abundance is likely a result of previous and

continued harvest of turtles and eggs (Groombridge and Luxmoore, 1989). We are not aware of any additional nesting data for the northern islands and did not receive any information on additional nesting sites during the 6-month public comment period.

Regarding the information requests and concerns over the endangered status, upon publication of the proposed rule, we notified other nations and requested their comments. We intend to update the recovery plans in the future after the DPS listings are finalized; however, we do not have an anticipated completion date for such plans at this time. The updated listings will allow for more specialized protection of each DPS. The endangered status of the Central West Pacific DPS will highlight it as a conservation priority among green turtle DPSs. We do not agree that the endangered status will increase the extinction risk and hinder recovery. Past ESA protections have led to improving trends in the Central West Pacific (Martin *et al.*, 2016), and we expect such improvements to continue.

#### *Comments on the Central South Pacific DPS*

*Comment 23:* We received several comments on the listing determination for the Central South Pacific DPS. The Governor of American Samoa stated that the endangered status would impact fisheries, fishing grounds, and the economy without providing the DPS with additional protection (i.e., relative to the current threatened status). In addition to these concerns, the Department of Marine and Wildlife Resources of American Samoa stated that the Status Review Report and proposed rule do not provide rigorous scientific assessment of threats of the Central South Pacific DPS because a PVA was not performed, there was limited survey effort in the Central South Pacific, the estimate of

nesting female abundance was not weighted to potential available habitats, and the recorded decline was based on one nesting site in French Polynesia. Others provided similar comments and requested further study of the DPS. One commenter stated that the nesting estimate should be weighted for survey effort. One commenter questioned whether turtles from American Samoa and French Polynesia should be part of the same DPS.

*Response:* Please see our responses to *Comment 3* and *Comment 9* regarding the process and data used to make listing determinations and the difference between threatened and endangered species. The ESA does not allow consideration of economic issues for listing determinations.

Regarding the comment on the impacts of the change in status, the new listings will allow for more specialized protection of each DPS. The endangered status of the Central South Pacific DPS will highlight it as a conservation priority among green turtle DPSs. This may encourage conservation actions in other nations. The status change for turtles in American Samoa is unlikely to result in additional implementation burdens because of longstanding regulations protecting threatened species in a manner similar to endangered species (50 CFR 17.42(b)(1); 50 CFR 223.205).

Regarding the comments on surveys and assessments, for the Central South Pacific DPS, the best available scientific and commercial data are summarized in the Status Review Report and include, but are not limited to, unpublished nesting and in-water surveys data in American Samoa collected by NMFS and the Department of Marine and Wildlife Resources of American Samoa. In the proposed rule, we requested

all data on nesting locations, abundance, trends, and threats, to ensure the identification and application of the best available data; however, we did not receive additional information for this DPS. We conclude that the data identified in the Status Review Report and applied in the proposed and final rule represent the best available scientific and commercial data and are sufficient to make a listing determination on the Central South Pacific DPS.

Regarding the comments on weighting data, to determine the status of the DPS, we analyzed the best available data on the section 4(a)(1) factors in the context of demographic parameters, including nesting abundance and trends. Nesting abundance was not weighted to potential available habitat or survey efforts because such data are not available. Instead, the Status Review Team provides two estimates of total abundance of nesting females. The first estimate of approximately 2,900 nesting females was based on 37 quantified nesting sites (Seminoff *et al.*, 2015). The Status Review Team provided a second estimate (approximately 3,600 nesting females) based on an additional 700 nesting females at 22 unquantified nesting sites, for which only qualitative information was available (Seminoff *et al.*, 2015). Such levels of abundance do not provide resilience against threats that remove green turtles from the population, such as harvest and stochastic events, which increase the extinction risk for small populations (Schaffer, 1981; Wright and Hubbell, 1983; Lande *et al.*, 2003). There appears to be a declining trend at the largest nesting beach in French Polynesia, which is considerably larger in abundance than all other known nesting beaches (Seminoff *et al.*, 2015). In addition, previous reports on nesting abundance in American Samoa indicate significant declines

relative to historical levels (Tuato'o-Bartley *et al.*, 1993; Craig *et al.*, 2004). Though we considered increasing nesting trends at smaller nesting beaches (Seminoff *et al.*, 2015), we conclude that such trends provide little resilience to the DPS, which is endangered by habitat destruction and modification, overexploitation, predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, and climate change.

Regarding the comments on the composition of the DPS, turtles nesting in American Samoa and French Polynesia commonly exhibit haplotypes from Clade III, which are uncommon in other DPSs; satellite tagging data indicate that these turtles share foraging habitat in Fiji, French Polynesia, and American Samoa (Seminoff *et al.*, 2015; NMFS, unpublished data, 2015). Therefore, we include turtles nesting and foraging in American Samoa and French Polynesia in the Central South Pacific DPS.

*Comment 24:* One commenter reported reef damage as a result of the recent tsunami in American Samoa and requested a discussion of the impacts.

*Response:* Tsunamis can destroy or modify nesting beach and marine habitats for green turtles. They deposit marine debris, which can entangle or be ingested by foraging turtles, on reefs. After the tsunami of September 29, 2009, over 8,000 pounds of debris were removed from 74 km of coral reef habitat in American Samoa

(<http://coralreef.noaa.gov/aboutcrp/news/featuredstories/dec09/asdebris/welcome.html>).

The frequency and intensity of storms are likely to increase as a result of climate change (IPCC, 2014) and are considered an increasing threat to the DPS. We considered these threats in our analysis of the Central South Pacific DPS, which we list as endangered.

*Comments on the Central North Pacific DPS*

*Comment 25:* We received many comments on the listing determination for the Central North Pacific DPS. Most commenters agreed with our listing determination, stating that the DPS should be listed under the ESA because it still faces numerous threats. One commenter stated that the Services cannot rely on politics or personal observation but must list the DPS as threatened (and cannot delist it) to comply with ESA, which requires us to base our listing determinations on the best available scientific and commercial data. Some commenters stated that the DPS should be listed as endangered because of the numerous threats and small nesting population abundance. Several commenters stated that the DPS should be delisted because of increasing nesting trends, observations of increasing in-water sea turtle abundance, or to reward conservation efforts and encourage similar efforts throughout the Pacific Islands. Several commenters questioned why the PVA and critical risk threshold were not used to determine the status of the DPS. Two commenters requested that NMFS perform in-water surveys to assess abundance prior to making a determination. The State of Hawai‘i Department of Land and Natural Resources (Hawai‘i DLNR) expressed support for the conservation efforts of the Services in partnership with Hawai‘i DLNR, nonprofit organizations, and communities, and stated that their Marine Wildlife Program, funded by NMFS’ Species Recovery Grants to States, has distributed over 200,000 barbless circle hooks to the fishing community.

*Response:* Please see our responses to *Comment 3* (regarding the listing determination process, rewarding conservation efforts, PVAs, and critical risk thresholds), *Comment 4* (regarding turtle observations), and *Comment 9* (regarding

perceived data limitations and requests for additional surveys).

We considered the increasing nesting trend, along with the small nesting population size and limited spatial structure, during our evaluation of the demographic factors. We concluded that these demographic parameters do not demonstrate adequate resilience against the threats of habitat loss and modification, disease and predation, inadequate regulatory mechanisms, bycatch, marine debris, boating activities, climate change, and limited nesting site diversity (i.e., 96 percent of nesting occurs at one low-lying atoll). For these reasons, we must list the DPS under the ESA. We do not list the DPS as endangered because of the positive nesting trend, conservation efforts, and the success of ESA protections in reducing the impact of some threats (especially the harvest of turtles and eggs). We list the DPS as threatened because it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range because of the section 4(a)(1) factors, listed above. We made this determination solely on the basis of the best available scientific and commercial data (identified in the proposed rule and Status Review Report) and after taking into account the conservation efforts of the State of Hawai‘i, which include a variety of effective outreach and education programs, including the distribution of barbless circle hooks to reduce hook and line bycatch of turtles.

*Comment 26:* We received many comments on the section 4(a)(1) factors for the Central North Pacific DPS. Many commenters identified threats to the Central North Pacific DPS, including entanglement in and ingestion of marine debris, accidental take in fisheries, FP, climate change, coastal development and beach use in the main Hawaiian



Islands (MHI), and harvest of turtles and eggs. One commenter identified an increase in nesting turtles at Turtle Bay on Oahu but stated that nests are destroyed by high surf, beach driving, and beach usage (including using a nest as a fire pit) and that turtles are threatened by poaching, harassment, pollution, and bycatch. One commenter requested a discussion of the impacts on the DPS caused by pollution around Johnston Atoll, vessel groundings in the Northwestern Hawaiian Islands (NWHI), natural disasters, and random variation and stochasticities. One commenter requested a discussion of how impacts to individuals affect the DPS (e.g., how the loss of Whale-Skate Island impacted the DPS). One commenter stated that there is little that can be done to protect known nesting beaches from the public, unless all development activities come to a halt and are reversed. One commenter described an increase in turtles at the Honokohau Harbor since poaching ended about a decade ago. One commenter stated that hatchlings at Moomomi have no significant predators. Several commenters stated that FP is not a threat to the DPS. One commenter stated that Hawai'i-based longline fisheries are not a threat to green turtles of any DPS and that the new listing should not result in the reinitiation of ESA section 7 consultations. Hawai'i DLNR identified several threats to nesting habitat including, in the NWHI, the inundation of nests due to sea level rise and in the MHI, coastal development, vehicular and pedestrian traffic, beach pollution and modification, and erosion. They also identified fishing and FP as threats. Regarding inadequate regulatory mechanisms, Hawai'i DLNR stated a need to increase coordination and data sharing; they stated their intention to compare existing State regulations to Federal regulations to identify needs or gaps and to work with NOAA fisheries to develop a State

management plan. Hawai‘i DLNR provided information on laws regulating the use of gill nets that have reduced bycatch by requiring inspection every 2 hours and removal after 4 hours; lay nets (a type of gill net) must be registered and tagged, and usage is restricted to one at a time, only during daylight hours, and in depths of less than 25 feet (for non-commercial users).

*Response:* Please see our responses to *Comments 6* and *8* for general information on the section 4(a)(1) factors and the impacts of climate change. We appreciate the State of Hawai‘i DLNR’s comments and continued efforts to conserve green turtles. As indicated by the State of Hawai‘i DLNR and other commenters, the Central North Pacific DPS is threatened by the following 4(a)(1) factors, described in detail in the Status Review Report and proposed rule: present and threatened habitat loss and degradation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, vessel activities, limited spatial diversity, and climate change. We do not have adequate data on poaching to assess the impact of this threat on the DPS.

Regarding the comment on the destruction or modification of habitat at Johnston Atoll, previous military activities, including nuclear testing and chemical weapons incineration, polluted the beaches and surrounding marine ecosystem (<http://www.fws.gov/refuges/profiles/index.cfm?id=12515>). Balazs (1985) described the potential impacts, which include petroleum contamination that adversely affects turtles by external fouling, ingestion, and interference with olfactory perception and food supply (Coston-Clements and Hoss, 1983). Underwater explosions of previously unexploded ordnances destroy turtle foraging habitats (Balazs, 1985). Radioactive particles were

spread over a portion of Johnston Atoll and nearshore waters and potentially concentrated in algae eaten by turtles (Balazs, 1985). Additional discharges include heavy metals, nerve gas, chemical weapons, herbicides, organophosphorus compounds, and the unknown contents of discarded 55 gallon drums, which have the potential to directly impact turtles and contaminate the turtles' forage base (Balazs, 1985).

Regarding the comment on destruction or modification of habitat by vessel groundings, such incidents damage foraging habitat and reef-associated organisms (i.e., green turtles' prey base) and release contaminants (e.g., fuel, hazardous substances, etc.), which threaten foraging habitat and prey (Keller *et al.*, 2009). Such groundings are possible wherever ships navigate through shallow waters (i.e., nearshore areas throughout the Hawaiian Archipelago). Thirteen reported vessel groundings have occurred in the NWHI in the last 60 years (Keller *et al.*, 2009); recent groundings in the MHI include the 2005 *M/V Cape Flattery* and 2009 *USS Port Royal* incidents. It is impossible to predict the number or severity of future vessel groundings; however, given the data on previous groundings, it is reasonable to expect additional groundings near green turtle foraging habitat, which occurs throughout the Hawaiian Archipelago. Like past events, these groundings are expected to modify foraging habitat and reduce the amount of available prey in the area.

Regarding the comment on loss of habitat at Whale-Skate Island, the disappearance of Whale-Skate Island at French Frigate Shoals (FFS) was due to erosion from severe winter storms in 1998 and 1999 (Antonelis *et al.*, 2006; Lowry *et al.*, 2011). We do not know how the disappearance of Whale-Skate Island impacted the population

because regular surveys had not been performed on that island. Turtles may have nested at neighboring islets of FFS; however, some may not have nested or may have nested in suboptimal habitats. Survey data indicate that the disappearance of Whale-Skate Island did not result in unusual increases in nesting at East Island in 1998, 1999, or 2000 relative to prior years (Humburg and Balazs, 2014). Furthermore, radio telemetry of four nesting females and four females at Trig and Whale-Skate Islands demonstrated that the turtles remained near these islands and did not travel the 9 km to East Island within a nesting season; over multiple years, only 33 percent of males and 24 percent of females strayed from Trig and Whale-Skate Islands (Dizon and Balazs, 1982). The authors concluded that once imprinted on a nesting beach, a green turtle is unlikely to switch its breeding habitat (Dizon and Balazs, 1982). Dizon and Balazs (1982) also emphasized the importance of maintaining foraging habitats and nesting beaches as free from disturbing influences as possible. Coastal development may result in the loss or modification of nesting and basking beaches and the nearshore habitats necessary for the reproductive success of the DPS.

Regarding the comment that little can be done to protect nesting beaches without halting or reversing all development, our listing determination is based on whether the species meets the definition of threatened or endangered, not whether activities could be performed. Nevertheless, we note that less drastic measures (such as minimizing impacts of artificial lighting, construction, vehicular and pedestrian traffic, and pollution on beaches during nesting seasons) are effective for protecting nesting beaches.

Regarding the comments on predation, introduced species, such as mongoose,

rats, dogs, feral pigs, and cats, prey on eggs and hatchlings at some nesting beaches in the MHI. Although hatchlings at Moomomi may have no significant land predators, they are likely to encounter predators at sea, including sea birds, sharks, and other large fish.

Regarding the comments on FP, we agree with the commenters who identified FP as a threat to the DPS. In a study of 3,732 green turtle strandings in Hawai‘i between 1982 and 2003, FP was the most common cause of stranding (28 percent) and had a specific mortality rate of 88 percent (Chaloupka *et al.*, 2008).

Regarding the comments on bycatch and the inadequacy of existing regulatory mechanisms, after FP, fishing line and gillnet entanglement are the leading cause of stranding and mortality of green turtles in Hawai‘i (Work *et al.*, 2015). The State of Hawai‘i has enacted important laws for gill and lay net fisheries. Requiring inspection of nets every 2 hours reduces, but does not eliminate, bycatch risk; entanglement and drowning still occur and are likely underreported (NMFS, 2012; Francke, 2013). As stated in the proposed rule, measures employed by U.S. longline fisheries have reduced green turtle interactions to negligible levels; however, reinitiation of consultation is still required if a new species is listed and may be affected by a Federally permitted action (50 CFR 402.16(d)).

Regarding the comment on natural disasters, since 1950, more than 50 hurricanes, tropical storms, and tropical depressions have affected Hawai‘i. We expect climate change to increase the frequency and intensity of such events (IPCC, 2014). Storm events during the nesting season are likely to disrupt green turtle nesting activity and hatchling production by flooding or exposing nests and altering thermal conditions (Van Houtan

and Bass, 2007), resulting in reduced cohort abundance. These events can also degrade turtle nesting habitat by reducing or eliminating sandy beaches and creating barriers to adult and hatchling movements. A single event is unlikely to result in large-scale losses over multiple nesting seasons; however, the increased frequency of such events combined with the effects of sea level rise increase the likelihood of this scenario (Baker *et al.*, 2006; Keller *et al.*, 2009; Reynolds *et al.*, 2012).

Regarding the comment on stochasticities, irregular, random, and stochastic events, such as those described above, increase the extinction risk of small populations (Schaffer, 1981; Wright and Hubbell, 1983; Lande *et al.*, 2003). Stochastic perturbations (such as demographic, environmental, and genetic stochasticities and natural catastrophes) may result in extinction even in an environment that, on average, is favorable for growth and persistence (Schaffer, 1981). Therefore, we are especially concerned about the effects of such threats on the Central North Pacific DPS.

*Comment 27:* We received many comments regarding the impact of climate change on the Central North Pacific DPS. One commenter did not think that climate change would affect nesting at FFS because the turtles would find alternative nesting sites and because nesting across the season and years provides resilience against storm events. One commenter asked how coastal development and climate change together would affect the DPS. Hawai‘i DLNR requested additional information regarding the projected timeframe when FFS might be inundated and the nesting sites unavailable.

*Response:* Please see our responses to *Comments 8* (regarding climate change) and *24* (responses to nesting habitat loss). The following information on climate change

is specific to the Central North Pacific DPS.

Baker *et al.* (2006) estimated that the islets of FFS would lose 15 to 65 percent of area under the median sea level rise scenario (0.48 m) and 26 to 99 percent of area under the maximum sea level rise scenario (0.88 m) by 2100. Sea level rise is expected to continue after 2100, and virtually all land at FFS would be submerged at a sea level rise of 2 m (Baker *et al.*, 2006). East Island, where 50 percent of nesting occurs at FFS (Balazs *et al.*, 2015), would persist the longest; however, it is not clear that displaced nesters from other areas of FFS (i.e., the other 50 percent of nesting) would begin nesting at East Island. Dizon and Balazs (1982) conclude that once imprinted on a nesting beach, a green turtle is unlikely to switch its breeding habitat.

Using a simulation model, Tiwari *et al.* (2010) estimated carrying capacity at East Island under current conditions and based on predictions of sea level rise by 2100. With 30 percent loss of nesting habitat and a 20 percent increase in mortality (to simulate the effects of sea level rise and crowding), carrying capacity would be reached at 60,000 to 100,000 nests (Tiwari *et al.*, 2010). The model considered all available area on the island suitable for nesting (Tiwari *et al.*, 2010); however, Balazs (1980) reports that very few turtles have nested in 5 of 17 available areas at East Island, despite apparently suitable habitat. Therefore, while there appears to be adequate suitable habitat at East Island, it is uncertain how many turtles would use this habitat for nesting if their current nesting habitat were lost.

Reynolds *et al.* (2012) examined sea level rise scenarios of 0.0 to 2.0 m, focusing on mean high water, which is lower than the spring tide estimates used by Baker *et al.*

(2006) and Tiwari *et al.* (2010). At FFS, they projected 12 percent land loss at 1.0 m sea level rise and 32 percent land loss at 2.0 m sea level rise, which would result in the complete submergence of five of the nine islets (Reynolds *et al.*, 2012). Reynolds *et al.* (2012) concluded that the decreases in nesting areas at FFS are likely to limit nesting habitat for the green turtles if philopatry (i.e., natal beach fidelity) prevents their dispersal. They also predicted that along the coastline, groundwater levels and turtle nesting density will likely change as a result of sea level rise and that these changes, along with increasing temperatures, would negatively impact green turtle nesting (Reynolds *et al.*, 2012). They identified the need for additional climate change adaptation strategies and planning for marine wildlife dependent on the terrestrial breeding habitats of FFS and Pearl and Hermes Atoll, which are likely to be inundated before 2100 (Reynolds *et al.*, 2012).

It must be noted that these studies used a passive, inundation or “bathtub” model, which is conservative and does not consider storm surges or the projected increases in storm intensity and frequency (Hawkes *et al.*, 2009). In addition, the flooding scenarios do not consider erosive recession of the shoreline causing land loss, long-shore drift redistribution of sediments (resulting in both gains and losses of land area), net permanent loss of sand volume offshore, and onshore sand deposition by overwash during high wave activity (Baker *et al.*, 2006).

These considerations appear to be important in Hawai‘i, where historical shoreline changes (i.e., coastal erosion) are one to two orders of magnitude greater than sea level rise (Romine *et al.*, 2013). In addition, erosion rates vary among the Hawaiian



Islands as a result of sea level rise, sediment availability, anthropogenic changes, littoral processes, wave conditions, and coastal and nearshore geomorphology (Romine *et al.*, 2013). At 9 of 10 sites in the MHI, the shorelines are projected to retreat 1 to 24 m by 2050 and 4 to 60 m by 2100 (Anderson *et al.*, 2015). Sea level rise is likely to lead to doubling of the shoreline recession by 2050 (and 2.5 times by 2100) as compared to extrapolations based on historical erosion (Anderson *et al.*, 2015). In addition, changes in storminess, wave climate, sediment availability, and climate related modifications in reef geomorphology will enhance erosion and inundation of low-lying coastal areas (Anderson *et al.*, 2015).

The MHI may also be exposed to “coastal squeeze,” i.e., as sea level rises, the landward migration of nesting beaches (and available nesting habitat) is inhibited due to coastal development and beachfront barriers (Fish *et al.*, 2005; Fish *et al.*, 2008). Therefore, as one commenter suggests, habitat modification due to coastal development is likely to be exacerbated by sea level rise.

In addition to sea level rise, we considered the effects of increased temperatures (including nest failure and skewed sex ratios), ocean acidification, and the impact of sea level rise on the movement of hatchlings, oceanic juveniles, and adults. Hawkes *et al.* (2014) conclude that breeding ecology may be fundamentally affected by climate change and that altered thermal regimes may have the most dramatic and insidious effects on sea turtles. This is especially a concern in Hawai‘i, where from 1990 to 2014, the sea surface temperature warmed an average of 0.034 °C annually (roughly three times the observed global average over this period), a change that is likely to result in the cessation of

basking, an adaptive trait exhibited by turtles of the Central North Pacific DPS, by 2100 (Van Houtan *et al.*, 2015).

*Comment 28:* Two commenters requested exemptions to existing take prohibitions. Their comments suggested that the Services should make specific findings for each of the threatened DPSs that protective regulations are necessary and advisable. The State of Hawai'i DLNR recommended that the Services partner with DLNR and communities to develop appropriate exemptions to take prohibitions under section 4(d) of the ESA to allow for more flexible, responsive, and enhanced management.

*Response:* As noted in the proposed rule and explained further in response to *Comment 7*, longstanding protective regulations apply the prohibitions of Section 9 (including the “take” prohibitions) to threatened sea turtles, with limited exceptions, and continue to remain in effect (50 CFR 17.42(b), 223.205, 223.206, and 223.207). Modifications to such regulations are beyond the scope of this rule, which finalizes the listing determinations for green turtle DPSs. The Services may extend the prohibitions of section 9 through protective regulations that apply generally to a group of threatened species and are not required to make species-specific determinations as new species are listed. *Sweet Home Chapter of Communities for a Great Oregon v. Babbitt*, 1 F.3d 1 (D.C. Cir. 1993), *modified on other grounds on reh'g*, 17 F.3d 1463 (D.C. Cir. 1994), *rev'd*, 515 U.S. 687 (1995). While we noted the existence of the existing regulations in the proposed rule to apprise the public of the full regulatory landscape for green turtles, we did not undertake a review, extension or modification of those rules, which are entirely separate. This is consistent with the approach we took for the listing

determinations of nine DPSs of loggerhead sea turtles (76 FR 58868, September 22, 2011).

*Comment 29:* We received several comments on the recovery (or lack thereof) of the Central North Pacific DPS. Several commenters stated that the DPS was recovered; however, one commenter stated that the DPS has not recovered because it has not met the recovery criteria.

*Response:* Please see our response to *Comment 16*. Because the commenters raised the issue of whether the species had met its recovery criteria, we provide the following information.

Prior to the identification and proposed listing of the Central North Pacific DPS, the Services published the Recovery Plan for U.S. Pacific Populations of the Green Turtle (i.e., the Recovery Plan; NMFS and USFWS, 1998). The Hawaiian population was included in the Recovery Plan. One of the recovery criteria has been met: we have identified all regional stocks to source beaches. The other recovery criteria have not been met. The DPS does not average 5,000 females nesting annually. Although the nesting population at East Island has increased over the past four decades, 25 years of monitoring data are not available for other nesting beaches. There are numerous threats at key foraging areas, where population trend data are not available. First priority tasks that have not been implemented include: determination of distribution and abundance of post-hatchlings; assessment and prevention of degradation of reefs by boating and diving activities; and prevention of degradation of reefs by pollution, coastal erosion, siltation, and blasting. There is no management plan to maintain sustained populations of turtles in

the absence of ESA protections, and there are no international agreements to reduce bycatch (and bycatch mortality) in foreign longline fisheries.

*Comment 30:* We received several comments on the carrying capacity of the Central North Pacific DPS. Several commenters stated that the DPS is overpopulated or has reached carrying capacity ( $K$ ), citing Chaloupka and Balazs (2007) or similar publications and disagreeing with Kittinger *et al.* (2013).

*Response:* Balazs *et al.* (2015) summarized all existing data and knowledge on the demographic variables of Hawaiian green turtles. After reviewing all data, from 1973 to 2012, they concluded that the Hawaiian green turtle is not at carrying capacity (Balazs *et al.*, 2015). Specifically, they found that the population growth rates from 1973 to 2003 (Chaloupka *et al.*, 2008), 1973 to 2004 (Chaloupka and Balazs, 2007), and 1973 to 2012 “are statistically indistinguishable, indicating that the last 10 years have not demonstrated any slowing of population growth or negative density dependence as some predicted (e.g., Chaloupka and Balazs, 2007)” (Balazs *et al.*, 2015). The authors concluded that the population is “still growing at a robust rate and underscore historical analyses (e.g., Kittinger *et al.*, 2013; Van Houtan and Kittinger, 2014) that suggest the population was significantly more abundant historically” (Balazs *et al.*, 2015). Because the Balazs *et al.* (2015) paper reviews all current and historical demographic data, we consider it the best available scientific data. We provide the following information to further explain this complex topic and resolve any perceived disagreement regarding available data.

There have been numerous studies on carrying capacity in the Hawaiian green turtle population, focusing on foraging, nesting site, and overall carrying capacity (e.g.,

Balazs and Chaloupka, 2004a; 2004b; 2006; Chaloupka and Balazs, 2007; Snover *et al.*, 2008; Tiwari *et al.*, 2010; Wabnitz *et al.*, 2010). Bjorndal *et al.* (2000) were the first to evaluate compensatory responses resulting from density-dependent effects for a green turtle population (i.e., sea turtles foraging in a Bahamian bay of approximately 20 km<sup>2</sup>). They found three lines of evidence to support a density-dependent effect: significant inverse correlation between population density and mean annual growth rate; correlations between condition index and mean annual growth rates (positive) and population density (negative); and the population abundance fluctuated around carrying capacity at levels likely to experience density-dependent effects (i.e., *K* of approximately 100 turtles; Bjorndal *et al.*, 2000). Balazs and Chaloupka (2004a) applied this approach to five foraging areas in Hawai‘i: Midway Atoll; Kane‘ohe Bay, O‘ahu; Pala‘au, Moloka‘i; and Kiholo Bay and Punalu‘u Bay, Hawai‘i. They found significant, long-term declines in size-specific growth rates at Pala‘au, Kiholo Bay, and Punalu‘u Bay, which may reflect limited food availability or nutritional quality (Balazs and Chaloupka, 2004a). Balazs and Chaloupka (2004a) did not state that carrying capacity had been reached at any location; instead, they interpreted these data to mean that carrying capacity for Kiholo and Punalu‘u “might” have been reached. The authors concluded that density-dependent effects are not well understood and warrant further investigation (Balazs and Chaloupka, 2004a). Wabnitz *et al.* (2010) used an ecosystem model to confirm that the green turtle aggregation has reached carrying capacity at Kaloko-Honokōhau National Historical Park. Based on these studies, we conclude that foraging carrying capacity has likely been reached at this one location on the Big Island of Hawai‘i, which may be ecologically

representative of green turtle habitats spanning 100 km on the west coast of that island (Balazs *et al.*, 2015). This does not, however, mean that green turtles have reached carrying capacity in their foraging habitat throughout the Hawaiian Archipelago. Numerous publications identify current or historically important foraging areas on: Kaua'i (Princeville, northwestern coastal areas of Na Pali, and southern coastal areas from Kukuiula to Makahuena Point); O'ahu (Kawela Bay, Kailua and Kaneohe Bays, northwestern coastal areas from Mokuleia to Kawailoa, Maunalua Bay, West Beach, and Sandy Beach); Moloka'i (southern coastal areas from Kamalo to Halena and Pala'au); Lana'i (northern and northeastern coastal areas bordering Kalohi and Auau Channels, Keomuku, Kuahua, and Polihua Beach); Maui (Hana District and Paia, Kahului Bay, Honokowai, Maliko Bay, and Olowalu); Hawai'i (Kau and North Kohala Districts, and Kapoho); and the NWHI (Necker Island, FFS, Lisianski Island, Pearl and Hermes Reef, Laysan Island, Midway Atoll, and Kure Atoll) (Balazs, 1980; Balazs, 1987; Arthur and Balazs, 2008). Furthermore, green turtles not only forage on native seagrass and algal species but also thrive on nonnative species (Arthur and Balazs, 2008; Russell and Balazs, 2009; McDermid *et al.*, 2015). Finally, if foraging carrying capacity were reached, we would expect nutritional constraints to lead to reduced nesting frequency due to density-dependent effects resulting from competition for limited food resources (Bjorndal *et al.*, 2000). However, the 3 to 4 year female remigration interval has remained constant since 1973 (Balazs and Chaloupka, 2004b; 2006; Balazs *et al.*, 2015), indicating that females do not spend additional time foraging before returning to nest. For these reasons, we conclude that the DPS has not reached foraging carrying capacity.

One study has also considered nesting carrying capacity. Tiwari *et al.* (2010) used a simulation model to estimate carrying capacity on the nesting beach of East Island, FFS. They found that East Island is well below carrying capacity and is capable of supporting a larger nesting population (Tiwari *et al.*, 2010). Therefore, we conclude that the DPS has not reached nesting carrying capacity.

Other studies considered overall carrying capacity (Balazs and Chaloupka, 2004a; 2006; Chaloupka and Balazs, 2007; Snover *et al.*, 2008). Three publications on modeling cited the long-term increase in the abundance of nesting females at East Island and a constant level of new recruits as possible evidence of nearing carrying capacity (Balazs and Chaloupka, 2004a; 2006; Chaloupka and Balazs, 2007); however, these studies were not conclusive and did not claim that the population was at carrying capacity (Balazs and Chaloupka, 2004a; 2006; Chaloupka and Balazs, 2007; Snover *et al.*, 2008). There were also several issues with these analyses. For example, Chaloupka and Balazs (2007) indicated the data were uninformative for  $K$  and that  $K$  was estimated with significant uncertainty. Furthermore, their model did not indicate that the population was near  $K$  because the plot of nester abundance showed an exponentially growing population (Snover *et al.*, 2008).

Finally, since the original consideration of carrying capacity in 2004, the abundance of nesting females at East Island has continued to increase from an estimated average of 338 nesting females (2000 – 2003) to an estimated average of 464 nesting females (2009 – 2012; Humburg and Balazs, 2014). Had carrying capacity been reached in 2004, we would have expected nesting abundance and population growth rates to level

off or decrease by now.

Kittinger *et al.* (2013) analyzed data from middens (i.e., domestic waste sites) and observational data from historical sources, including interviews with community elders who described the harvest of nesting turtles at Kaua'i beaches prior to 1960. It is unlikely that the community elders would have confused nesting and basking turtles, as suggested by some commenters. The *Hawaiian Gazette* (July 19, 1912) cited Judge Kapoikahi watching “baby turtles scuttle down the beach” in Maui; hatchlings are not likely to be confused with other life stages. These examples are indicative of nesting in the MHI prior to ESA protections. Van Houtan and Kittinger (2014) analyzed nearly three decades (1948 to 1974) of data on commercial landings data from a green turtle fishery in the MHI. These data indicate that the small-scale fishery and local market demand were key factors in the decline of Hawaiian green turtles, which were already significantly depleted by prior exploitation (Van Houtan and Kittinger, 2014).

In summary, we conclude that historically the DPS was significantly more abundant and has not yet reached foraging, nesting, or overall carrying capacity.

*Comment 31:* One commenter indicated that the determination on the Central North Pacific DPS is inconsistent with the 2012 International Union for Conservation of Nature (IUCN) Red List of Threatened Species™ (i.e., Red List) assessment, which categorized the Hawaiian subpopulation of green turtles as “least concern.”

*Response:* Species classifications under the ESA and Red List are not equivalent; data standards, criteria used to evaluate species, and treatment of uncertainty are not the same, nor is the legal effect.



Unlike the ESA, the Red List is not a statute and is not a legally binding or regulatory instrument. It does not include legally binding requirements, prohibitions, or guidance for the protection of threatened (i.e., critically endangered, endangered, or vulnerable) taxa (IUCN, 2012). Rather, it provides taxonomic, conservation status, and distribution information on species. The Red List is based on a system of categories and criteria designed to determine the *relative* risk of extinction (<http://www.iucnredlist.org/about/introduction>), classifying species in one of nine categories, as determined via quantitative criteria, including population size reductions, range reductions, small population size, and quantitative extinction risk. The ESA requires the Services to list species if they are endangered or threatened by any or a combination of the section 4(a)(1) factors (16 U.S.C. 1533(a)(1)), as based on the best available scientific and commercial data, which may include a qualitative threats analysis.

Thus, the ESA and Red List are inherently different. To the extent that the information described within Red List is relevant to our determination, we do not agree that the DPS “is approaching full recovery to pre-exploitation levels” (IUCN, 2012). The IUCN cites the modeling study by Chaloupka and Balazs (2007), which has been refuted by more recent and complete data (Balazs *et al.*, 2015), which we consider to be the best available scientific data. In response to *Comment 30*, we identify the problems with the Chaloupka and Balazs (2007) study. Their pre-exploitation estimate of 320,000 turtles is likely an underestimate because it is based solely on small-scale fishery landings from 1944 to 1973; however, broad-scale commercial exploitation of the population began in

the early 19<sup>th</sup> century and may have been quite extensive (Amerson, 1971; Van Houtan and Kittinger 2014). In addition, traditional exploitation occurred for centuries prior (Chaloupka and Balazs, 2007; Kittinger *et al.*, 2013). Therefore, it is likely that the DPS was significantly more abundant historically (Kittinger *et al.*, 2013; Van Houtan and Kittinger, 2014; Balazs *et al.*, 2015).

We agree with the IUCN's identification of the following threats to the DPS: restricted location (i.e., utilization of one rookery); erosion and habitat loss throughout the NWHI; climate impacts; illegal harvesting; FP, which causes debilitating tumors of the skin and internal organs; coastal development and urbanization, fishing line ingestion or entanglement from recreational shore based fisheries, entanglement in gill nets, vessel collisions, miscellaneous hazards such as spear wounds; and climate change (increasing sea surface temperature and increasing intensity and frequency of severe storms) (<http://www.iucnredlist.org/details/16285718/0>). Because of these factors, the Central North Pacific DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

*Comment 32:* One commenter stated that the recapture of three Central North Pacific turtles in Japan, the Marshall Islands, and the Philippines out of 7,360 total recaptures signifies adequate gene flow to homogenize populations (i.e., the populations are not genetically discrete).

*Response:* We have not detected any shared mtDNA haplotypes between the Central North Pacific DPS and the Central West Pacific or the East Indian-West Pacific DPSs. If gene flow had been adequate to homogenize the DPSs, we would expect shared

haplotypes and consistent haplotypic frequencies in these DPSs. Furthermore, in 50 years of extensive nesting surveys in the Hawaiian Archipelago, no recaptures or haplotypes from the Central West or East Indian-West Pacific DPSs have been encountered.

*Comment 33:* Several commenters stated that green turtles were consuming too much limu (i.e., Hawaiian algae).

*Response:* The extent of turtle consumption of limu is not relevant to our listing determination because it does not represent a threat to turtles; however, we believe a fuller understanding of this issue is important to promoting conservation of green turtles and dispelling misinformation. We provide the following information because reductions in limu are likely caused by other species. Nonnative algae pose one of the greatest threats to native algae by competing for space. Additional threats to limu include: storm water discharges, pollution, development, and overharvesting by humans (Wianecki, 2010; Lapointe and Bedford, 2011). At Kaloko-Honokōhau National Historical Park, Wabnitz *et al.* (2010) determined that sea urchins have the greatest impact (45 percent) on algal resources, followed by herbivorous fish (14.4 percent), with green turtles only accounting for 0.2 percent of total herbivory consumption.

Green turtles are selective foragers that target specific species (Balazs, 1980). Only two of these species (*U. fasciata* and *C. edule*, which are both common; Abbott, 1984) are favored by humans. In fact, green turtles may provide benefits to limu by consuming nonnative algae (Arthur and Balazs, 2008; Russel and Balazs, 2009).

*Comment 34:* One commenter stated that the increase in green turtles is linked to an increase in sharks and shark attacks on humans. One commenter stated that green

turtles damage coral in Kaneohe Bay, Hawai'i.

*Response:* As we noted in our response to *Comment 33*, our listing determination must be based solely on a review of the status of the species; extraneous considerations are not relevant. Nevertheless, the best available scientific and commercial data do not link the increasing abundance of green turtles to increasing shark abundance or attacks (<http://www.honolulumagazine.com/Honolulu-Magazine/February-2016/Why-Are-There-So-Many-Shark-Attacks-in-Hawaii/>). Furthermore, green turtles likely improve the overall health of coral reefs in Kaneohe Bay by controlling the overgrowth of nonnative algae (Pandolfi *et al.*, 2005; Russel and Balazs, 2009).

*Comments on the East Pacific DPS*

*Comment 35:* The Instituto del Mar del Perú suggested breaking the East Pacific DPS into two DPSs and listing the southeast Pacific as endangered for the following reasons: (1) While there is an increasing trend at Michoacán nesting beaches (Delgado-Trejo and Alvarado-Díaz, 2012), there have not been substantial increases at Galápagos nesting beaches in the past 15 years (IAC, 2011, 2012, 2013, 2014); (2) Peru lists the species as endangered (D.S. No. 004-2014-MINAGRI) and prohibits hunting, capture, possession, and transportation of specimens, products and/or byproducts; in addition, Perú is a signatory of several international agreements for the conservation of sea turtles that developed their work plan and resolutions on the basis of the IUCN Red List category of endangered (Seminoff, 2004); (3) southeast Pacific turtles face numerous threats including bycatch, harvest, illegal trade of turtle meat, oil, and derivatives (Alfaro Shigueto *et al.*, 2010, 2011; de Paz et al, 2002); and (4) increasing threats include coastal

development, artisanal fisheries, and aquaculture, which occur close to foraging areas and cause habitat degradation.

*Response:* We appreciate the Instituto del Mar del Perú's comments and efforts to conserve sea turtles. For differences between the ESA and IUCN Red List, please see *Comment 31*. Turtles of the East Pacific DPS share phenotypic traits, including size (i.e., small) and color (i.e., black), that are not found in other Pacific DPSs. They share haplotypes from Clade VIII and do not exhibit haplotypes from other clades (Seminoff *et al.*, 2015). There is significant genetic structure within the DPS (i.e., four regional stocks; Seminoff *et al.*, 2015); however, the divergence among stocks is much less than the divergence among DPSs, as indicated by nuclear (Roden *et al.*, 2013) and mtDNA (Seminoff *et al.*, 2015). Furthermore, the most significant differences do not occur between turtles nesting at Mexican and Galápagos beaches, but rather between the turtles nesting at the Revillagigedos Islands (Mexico) and all others (Seminoff *et al.*, 2015). Genetically, females nesting at Michoacán (Mexico) are more similar to females nesting in the Galápagos Islands than to those nesting at the Revillagigedos Islands (Seminoff *et al.*, 2015). Satellite tracking indicates that turtles nesting in Michoacán, Costa Rica, and the Galápagos Islands converge at foraging areas in Central America (Hart *et al.*, 2015), and at least one Michoacán turtle was recovered as far south as Colombia (Alvarado-Díaz and Figueroa, 1990). Based on the best available scientific and commercial data which indicates connectivity within the DPS, we conclude that the East Pacific DPS is discrete and significant and should not be further divided.

Conservation efforts have led to increasing abundance at numerous nesting sites

throughout the range of the DPS. In addition to the increasing trends at Michoacán, we found stable to slightly increasing nesting trends at Galápagos nesting beaches, which host the second largest nesting aggregation of the DPS (Seminoff *et al.*, 2015). We do not find that the East Pacific DPS is presently in danger of extinction; however, it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range due to habitat loss and degradation, overexploitation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, boat strikes, red tide poisoning, and climate change. Therefore, we finalize our proposal to list the East Pacific DPS as threatened under the ESA.

### **Summary of Changes from the Proposed Rule**

We make the following changes from the proposed rule:

- We change the boundaries of the ranges for the North and South Atlantic DPSs because all islands of the U.S. Virgin Islands (not just St. Croix) should be included in the range of the South Atlantic DPS, as indicated by genetic and other data presented in the Status Review Report.
- In the proposed rule, we erroneously listed the California and Oregon border as 41° N; we remove the reference to the California and Oregon border, however, 41° N remains the northern boundary for the range of the East Pacific DPS.
- We corrected typographical errors in the listing tables and throughout the preamble, including correcting the citation to the existing critical habitat designation for the North Atlantic DPS, at 50 CFR 226.208.
- We include information on the National Colombia Programme for Conservation

of Marine and Continental Turtles in our consideration of conservation efforts for the South Atlantic and East Pacific DPSs.

- We indicate that the BIOT, located within the range of the Southwest Indian DPS, protects green turtles and their habitat; however, conservation efforts are not sufficient to adequately reduce all threats (Mortimer and Day, 1999).
- We reviewed, and incorporate as appropriate, scientific data from references that were not included in the Status Review Report and proposed rule. We include the following references, which together with previously cited references, represent the best available scientific and commercial data; however, these new references do not present significant new findings that change any of our proposed listing determinations: Benaka *et al.*, 2013; Adimey *et al.*, 2014; Bourjea *et al.*, 2014; Brei *et al.*, 2014; Carreras *et al.*, 2014; Casale and Mariani, 2014; Dutton *et al.*, 2014a; Dutton *et al.*, 2014b; González Carman *et al.*, 2014; Hays *et al.*, 2014; Keller *et al.*, 2014; Lagueux *et al.*, 2014; Naro-Maciel *et al.*, 2014a; Naro-Maciel *et al.*, 2014b; Ng *et al.*, 2014; Read *et al.*, 2014; Schuyler *et al.*, 2014; Senko *et al.*, 2014; Shamblin *et al.*, 2014; Van Houtan *et al.*, 2014; Balazs *et al.*, 2015; Baudouin *et al.*, 2015; Brost *et al.*, 2015; Cavallo *et al.*, 2015; Esteban *et al.*, 2015; Guilder *et al.*, 2015; Hart *et al.*, 2015; Jourdan and Fuentes, 2015; Katsanevakis *et al.*, 2015; Mancini *et al.*, 2015; Rhodes, 2015; Ruiz-Izagirre *et al.*, 2015; Santidrián Tomillo *et al.*, 2015; Santos *et al.*, 2015b; Stokes *et al.*, 2015; Stringell *et al.*, 2015; Ullmann and Stachowitsch, 2015; Van Houtan *et al.*, 2015; Wedemeyer-Strombel *et al.*, 2015; Wilcox *et al.*, 2015; Work *et al.*, 2015;

Yang *et al.*, 2015; Martin *et al.*, 2016; Halley *et al.*, in review; Summers *et al.*, in progress; NMFS, in progress.

### **Identification of DPSs**

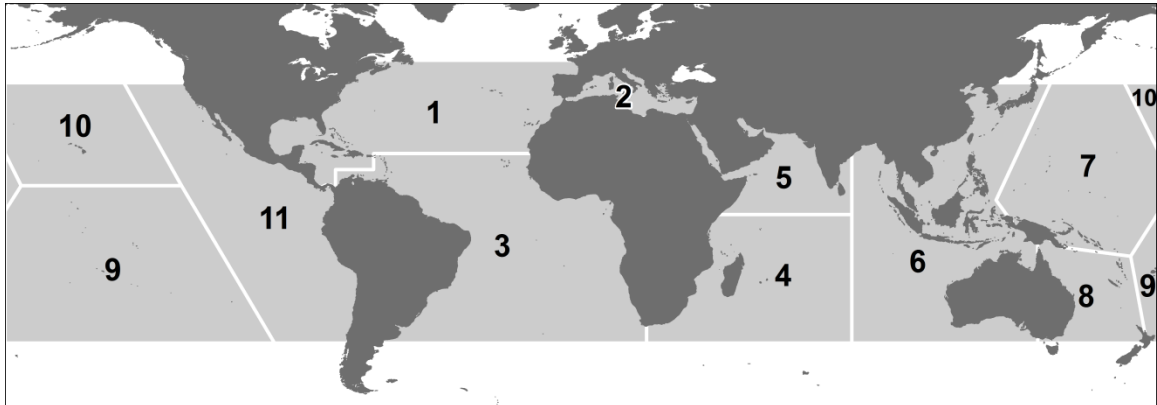
The comments that we received on the proposed rule did not change our conclusions regarding the identification of DPSs. We reviewed relevant and recently available scientific data that were not included in the Status Review Report and proposed rule (Carreras *et al.*, 2014; Casale and Mariani, 2014; Dutton *et al.*, 2014a; Dutton *et al.*, 2014b; Hays *et al.*, 2014; Naro-Maciel *et al.*, 2014a; Naro-Maciel *et al.*, 2014b; Ng *et al.*, 2014; Read *et al.*, 2014; Shamblin *et al.*, 2014; Baudouin *et al.*, 2015; Esteban *et al.*, 2015; Hart *et al.*, 2015; Mancini *et al.*, 2015; Stokes *et al.*, 2015; Yang *et al.*, 2015). The identification of fine-scale genetic structure or mixing at foraging areas for some DPSs does not change our findings for the proposed DPSs. Based on the best available scientific and commercial data, we conclude that the DPSs identified in the proposed rule are discrete and significant. Therefore, we incorporate herein all information on the identification of DPSs in the Status Review Report and proposed rule, with the following exception as discussed above: We changed the boundary between the North and South Atlantic DPSs so that all islands of the U.S. Virgin Islands (not just St. Croix) would be included in the South Atlantic DPS.

In summary, we applied our joint DPS policy (61 FR 4722, February 7, 1996) to identify 11 discrete and significant DPSs: North Atlantic, Mediterranean, South Atlantic, Southwest Indian, North Indian, East Indian-West Pacific, Central West Pacific, Southwest Pacific, Central South Pacific, Central North Pacific, and East Pacific (Figure



1).

Figure 1. Map of the green turtle DPSs: (1) North Atlantic, (2) Mediterranean, (3) South Atlantic, (4) Southwest Indian, (5) North Indian, (6) East Indian-West Pacific, (7) Central West Pacific, (8) Southwest Pacific, (9) Central South Pacific, (10) Central North Pacific, and (11) East Pacific.



## **North Atlantic DPS**

The comments that we received on the North Atlantic DPS and additional information that became available since the publication of the proposed rule did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the North Atlantic DPS provided in the Status Review Report and proposed rule, with the following exceptions: the boundary of the DPS (which was changed to exclude all islands of the U.S. Virgin Islands), and the application of the critical risk threshold from the Status Review Report (which, as we explained in the proposed rule, does not directly correlate with the ESA definitions of “endangered” and “threatened”). The following represents a brief summary of that information.

The range of the DPS extends from the boundary of South and Central America, north along the coast to include Panama, Costa Rica, Nicaragua, Honduras, Belize, Mexico, and the United States. It extends due east across the Atlantic Ocean at 48° N. and follows the coast south to include the northern portion of the Islamic Republic of Mauritania (Mauritania) on the African continent to 19° N. It extends west at 19° N. to the Caribbean basin to 65.1° W., then due south to 14° N., 65.1° W., then due west to 14° N., 77° W., and due south to 7.5° N., 77° W., the boundary of South and Central America. It includes Puerto Rico, the Bahamas, Cuba, Turks and Caicos Islands, Republic of Haiti, Dominican Republic, Cayman Islands, and Jamaica. The North Atlantic DPS includes the Florida breeding population, which was originally listed as endangered under the ESA (43 FR 32800, July 28, 1978).

*Demographic Parameters for the North Atlantic DPS*

The DPS exhibits high nesting abundance, with an estimated total nesting abundance of 167,424 females at 73 nesting sites. More than 100,000 females nest at Tortuguero, Costa Rica, and more than 10,000 females nest at Quintana Roo, Mexico. Nesting data indicate long-term increases at all major nesting sites. There is little genetic substructure within the DPS, and turtles from multiple nesting beaches share common foraging areas. Nesting is geographically widespread and occurs at a diversity of mainland and insular sites.

*Section 4(a)(1) Factors for the North Atlantic DPS*

Nesting beaches are degraded by coastal development, coastal armoring, beachfront lighting, erosion, sand extraction, and vehicle and pedestrian traffic. Foraging habitat is degraded by pollution (including oil spills, agricultural and residential runoff, and sewage), propeller scarring, anchor damage, dredging, sand mining, marina construction, and beach nourishment. The harvest of green turtles and eggs remains legal in several countries (e.g., Lagueux *et al.*, 2014), and illegal harvest occurs in many areas. FP is a chronic, often lethal disease that affects turtles throughout the range of the DPS, and (as discussed in a summit held since the publication of the proposed rule) especially in areas with some degree of environmental degradation resulting from altered watersheds (NMFS, in progress). It may be increasing in prevalence in some areas (e.g., Stringell *et al.*, 2015). As recently described by Brost *et al.* (2015), predation is one of the main sources of egg and hatchling mortality in some areas. Jaguars also prey on nesting females, as recently described by Guilder *et al.* (2015). Though numerous regulatory mechanisms apply to the DPS, many are inadequate due to limited implementation and

enforcement. There has been one regulatory change since the publication of the proposed rule, which reduces the inadequacy of regulatory mechanisms: The State of Louisiana repealed the prohibition on enforcement of turtle excluder device regulations (LA HB668, July 1, 2015). Fisheries bycatch in artisanal and industrial fishing gear (e.g., gill net, trawls, and dredges) results in substantial mortality (e.g., Benaka *et al.*, 2013). Periodic dredging of sediments from navigational channels can also result in incidental mortality of sea turtles (<http://el.erdc.usace.army.mil/seaturtles/takes.cfm?Type=Total&Code=Table>). Vessel strikes are a significant and increasing source of mortality in the U.S. Atlantic and Gulf of Mexico and likely in other locations. In some areas, there has been an increase in strandings due to entanglement in marine debris and the ingestion of plastics, as recently described by Adimey *et al.* (2014), which causes blockage in the gut and dilutes the nutritional contribution of the diet. Cold stunning, the hypothermic reaction that occurs when sea turtles are exposed to prolonged cold water temperatures, occurs regularly throughout the range of the DPS and may result in a UME. Oil spills may also result in a UME. The *Deepwater Horizon* oil spill was particularly harmful to post-hatchlings and surface-pelagic juveniles by temporarily destroying their *Sargassum* habitat (Powers *et al.*, 2013) and resulting in the ingestion of contaminants (Witherington *et al.*, 2012). Climate change is likely to have a negative effect on the DPS. Sea level rise is likely to alter green turtle nesting habitat and reduce nesting success. Increased sand temperature is likely to result in skewed sex ratios and lethal incubation conditions, as recently described by Santos *et al.* (2015a).

### *Conservation Efforts for the North Atlantic DPS*

Conservation efforts include bycatch reduction measures, nesting beach acquisitions, and nest protection programs to reduce harvest and predation. Numerous initiatives, such as the Colombia National Programme for the Conservation of Marine and Continental Turtles, promote education, conservation, and outreach. The recovery of the DPS is dependent on ESA protections and those provided by local, State, and foreign laws, some of which may have been triggered by the original ESA listing. Though ESA protections would be lost if the DPS were not listed under the ESA, it is unclear whether local, State, and foreign laws would remain in place.

### *Extinction Risk Analysis for the North Atlantic DPS*

The high nesting abundance, increasing trends, connectivity, and spatial diversity provide the DPS with some resilience against current threats (i.e., the threats have not prevented positive population growth in recent years). The DPS is threatened by several factors: the current and projected destruction and modification of its habitat; legal and illegal harvest of turtles and eggs; disease and predation; inadequacy of regulatory mechanisms to regulate the underlying threats; and other factors (i.e., fisheries bycatch, channel dredging, marine debris, cold stunning, and climate change). Though beneficial, the conservation efforts do not adequately reduce the threats. Based on the above information, we conclude that the DPS is not presently in danger of extinction throughout all or a significant portion of its range. Listing is warranted because numerous threats remain, several of which are likely to increase within the foreseeable future; all threats are likely to increase if ESA protections are lost, resulting in curtailed or reversed

population trends. We conclude that the North Atlantic DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

*Listing Determination for the North Atlantic DPS*

For the above reasons, we list the North Atlantic DPS as a threatened species under the ESA.

**Mediterranean DPS**

The comments that we received on the Mediterranean DPS and additional information that became available since the publication of the proposed rule did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the Mediterranean DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the DPS includes the Mediterranean Sea (excluding the Black Sea), with the Strait of Gibraltar as its western boundary.

*Demographic Parameters for the Mediterranean DPS*

The DPS exhibits low abundance, with an estimated total nester abundance of 404 to 992 females at 32 sites. The DPS is severely depleted relative to historical levels; however, five of seven nesting sites indicate slightly increasing trends. Connectivity is high (i.e., little to no genetic substructure), but nesting site diversity is low.

#### *Section 4(a)(1) Factors for the Mediterranean DPS*

Nesting habitat is destroyed or modified by coastal development, construction, beachfront lighting, sand extraction, beach erosion, vehicular and pedestrian traffic, and beach pollution. Fishing and pollution result in the destruction and modification of foraging habitat. The harvest of turtles and eggs contributed to the historical decline of this DPS and continues in several areas. Numerous species prey on eggs and hatchlings. Many international and national regulatory mechanisms exist; however, fisheries bycatch and tourism impacts are poorly regulated. Fisheries bycatch results in substantial mortality and is a major threat to the DPS. Vessel activity and strikes result in mortality, injury, and abandoned nesting attempts. Marine debris is a major concern. Climate change is likely to alter thermal sand characteristics; in some areas, hatchling sex ratios are already highly female biased (up to 95 percent).

#### *Conservation Efforts for the Mediterranean DPS*

Conservation efforts include protection of nesting beaches, removal of marine debris, and establishment of marine protected areas. In a recent study, Ullmann and Stachowitsch (2015) identified 49 stranding response (i.e., rescue) centers, stations, and institutions throughout the Mediterranean; however, communication among such facilities is limited, and there are gaps in coverage.

#### *Extinction Risk Analysis for the Mediterranean DPS*

As a result of low nesting abundance (concentrated primarily in one area), weak population growth rates, and low diversity of nesting sites, the DPS has little resilience to threats, which include: habitat loss and degradation, overexploitation, predation,



inadequate regulatory mechanisms, fisheries bycatch, vessel traffic, marine debris, and climate change. Although they are beneficial, the conservation efforts do not adequately reduce threats. We conclude that the Mediterranean DPS is in danger of extinction throughout all or a significant portion of its range.

*Listing Determination for the Mediterranean DPS*

For the above reasons, we list the Mediterranean DPS as an endangered species under the ESA.

**South Atlantic DPS**

The comments that we received on the South Atlantic DPS and additional information that became available since the publication of the proposed rule did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the South Atlantic DPS provided in the Status Review Report and proposed rule, with the following exceptions: the boundary of the DPS (which was changed to include all islands of the U.S. Virgin Islands), and the application of the critical risk threshold from the Status Review Report (which, as we explained in the proposed rule, does not directly correlate with the ESA definitions of “endangered” and “threatened”). The following represents a brief summary of that information.

The range of the South Atlantic DPS begins at the border of Panama and Colombia at 7.5° N., 77° W., heads due north to 14° N., 77° W., then east to 14° N., 65.1° W., then north to 19° N., 65.1° W., and along 19° N. latitude to Mauritania in Africa, to include the U.S. Virgin Islands in the Caribbean. It extends along the coast of Africa to South Africa, with the southern border being 40° S. latitude.

### *Demographic Parameters for the South Atlantic DPS*

The DPS exhibits high nesting abundance, with an estimated total nester abundance of 63,332 females. Two nesting sites have greater than 10,000 nesting females: Poilão, Guinea-Bissau and Ascension Island, UK (Weber *et al.*, 2014). Nesting trends are increasing at the 14 sites where abundance data are available. Within the DPS, there is little genetic substructure, and turtles share important foraging areas. Nesting is geographically widespread and diverse, occurring along the western coast of Africa, on Caribbean and South Atlantic islands, and along eastern South America.

### *Section 4(a)(1) Factors for the South Atlantic DPS*

Nesting habitat is destroyed or modified by coastal development and construction, placement of erosion control structures and other barriers to nesting, beachfront lighting (e.g., Brei *et al.*, 2014), vehicular and pedestrian traffic, sand extraction, beach erosion, beach sand placement, beach pollution, removal of native vegetation, and planting of non-native vegetation. Foraging habitats are degraded by pollution, including agriculture and industrial runoff, and anchor damage to seagrass beds. The harvest of turtles and eggs contributed to the historical declines of the DPS and continues in some areas, legally and illegally. FP is highly variable in its presence and severity throughout the range of the DPS. Predators eat eggs, hatchlings, and nesting females. Throughout the range of the DPS, laws protecting sea turtles and their nesting habitats are implemented to varying degrees, but regulatory mechanisms to address fisheries bycatch are limited. Turtles are incidentally captured throughout the South Atlantic DPS in pelagic and demersal longlines, drift and set gill nets, bottom and mid-water trawls, fishing dredges, pound nets

and weirs, haul and purse seines (e.g., Bourjea *et al.*, 2014), pots and traps, and hook and line gear. There is a high prevalence of marine debris and plastic ingestion (e.g., González Carman *et al.*, 2014). Sea level rise and increased storm frequency and intensity are likely to eliminate the functionality of nesting beaches on low-lying islands. Some beaches will likely experience lethal incubation temperatures that will result in the complete loss of hatchling cohorts.

#### *Conservation Efforts for the South Atlantic DPS*

Most nations in South America, the Caribbean, and Africa have national legislation or programs sponsored by state governments, local communities, academic institutions, and organizations to protect sea turtles and their nesting and foraging habitats. Conservation efforts at the primary nesting beaches, such as Ascension Island, include legal prohibitions as well as extensive monitoring, outreach, and research (<http://www.seaturtle.org/mtrg/projects/tukot/ascension.shtml>).

#### *Extinction Risk Analysis for the South Atlantic DPS*

As a result of the high population abundance, increasing nesting trend, and diverse nesting sites, the DPS is somewhat resilient to current threats, which include: habitat loss and degradation, overexploitation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, oil exploration and extraction, and climate change. The conservation efforts vary in consistency and efficacy throughout the range of the DPS and do not adequately mitigate all threats. We conclude that the DPS is not presently in danger of extinction throughout all or a significant portion of its range. Listing is warranted because numerous threats remain, some of which are likely to

increase within the foreseeable future; the loss of ESA protections would further exacerbate all threats. We conclude that the DPS is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

#### *Listing Determination for the South Atlantic DPS*

For the above reasons, we list the South Atlantic DPS as a threatened species under the ESA.

#### **Southwest Indian DPS**

The comments that we received on the Southwest Indian DPS did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the Southwest Indian DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the Southwest Indian DPS has as its western boundary the shores of continental Africa from the equator, just north of the Kenya-Somalia border, south to the Cape of Good Hope (South Africa), and extends south from there along 19° E. longitude to 40° S., 19° E. Its southern boundary extends along 40° S. latitude from 19° E. to 84° E., and its eastern boundary runs along 84° E. longitude from 40° S. latitude to the equator. Its northern boundary extends along the equator from 84° E. to the continent of Africa just north of the Kenya-Somalia border.

#### *Demographic Parameters for the Southwest Indian DPS*

The DPS exhibits high abundance, with an estimated total nester abundance of 91,059 females at 15 nesting sites (four of which host more than 10,000 females).

Nesting data at these mostly protected beaches indicate increasing trends. Within the DPS, there is a moderate degree of genetic substructure (i.e., at least two stocks), with connectivity between proximate sites. The high diversity of nesting habitat includes insular and continental beaches.

#### *Section 4(a)(1) Factors for the Southwest Indian DPS*

Nesting beaches are threatened by increased tourism and artificial lighting. Foraging habitats are degraded by development of the coastline, dredging, land-fill, sedimentation, and sand extraction. Legal and illegal harvest of turtles and eggs persists throughout the DPS. Poaching of nesting females has led to declines at some beaches, and foraging turtles are heavily poached in several areas. Existing regulatory mechanisms to address poaching and bycatch are often inadequately implemented and/or enforced, as demonstrated by the high level of illegal harvest and bycatch within this DPS. The DPS is threatened by bycatch in demersal and pelagic longlines, trawls, gill nets, and purse seines (e.g., Bourjea *et al.*, 2014). Sea level rise and increasing storm events (as a result of climate change) are likely to reduce nesting habitat throughout the range of the DPS because much of the nesting occurs at low-lying islands and atolls.

#### *Conservation Efforts for the Southwest Indian DPS*

Several regional initiatives have promoted conservation, management, research and education throughout the range of the DPS. Other multinational programs and national laws protect sea turtles. For example, Mortimer and Day (1999) state that green

turtles and nesting habitat in the Chagos Archipelago are well protected by the BIOT administration (Mortimer and Day, 1999) and a large marine protected area (Hays *et al.*, 2014); however, monitoring and conservation efforts are not sufficient to adequately reduce all threats.

#### *Extinction Risk Analysis for the Southwest Indian DPS*

The high nesting abundance, increasing nesting trends, and spatial and genetic diversity of the DPS provide some resilience to threats, which include: habitat loss and degradation, overexploitation of eggs and turtles, inadequate regulatory mechanisms, fisheries bycatch, and climate change. Despite many beneficial conservation efforts, poaching and bycatch remain major threats. We conclude that the DPS is not presently in danger of extinction throughout all or a significant portion of its range. Listing is warranted because of the high levels of harvest and bycatch, in the context of increasing impacts from climate change, are likely to overwhelm the resilience of the DPS. We conclude that the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

#### *Listing Determination for the Southwest Indian DPS*

For the above reasons, we list the Southwest Indian DPS as a threatened species under the ESA.

#### **North Indian DPS**

We did not receive comments on the North Indian DPS, and there are no changes to our proposed listing determination. Therefore, we incorporate herein all information on the North Indian DPS provided in the Status Review Report and proposed rule, with the

exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the North Indian DPS begins at the border of Somalia and Kenya north into the Gulf of Aden, Red Sea, Persian Gulf and east to the Gulf of Mannar off the southern tip of India and includes a major portion of India’s southeastern coast up to Andhra Pradesh. The southern and eastern boundaries are the equator (0°) and 84° E., respectively, which intersect in the southeast corner of the range of the DPS. It is bordered by the following countries (following the water bodies from west to east): Somalia, Djibouti, Eritrea, Sudan, Egypt, Israel, Jordan, Saudi Arabia, Yemen, Oman, United Arab Emirates, Qatar, Bahrain, Kuwait, Iraq, the Islamic Republic of Iran, Pakistan, India, and Sri Lanka.

#### *Demographic Parameters for the North Indian DPS*

The DPS exhibits high abundance, with an estimated total nester abundance of 55,243 females at 38 nesting sites. Two sites host greater than 10,000 nesting females: Ras Sharma, Yemen, and Ras Al Hadd, Oman. Nesting trends are increasing at Ras Al Hadd but possibly declining at other sites. Nesting is moderately dispersed, though concentrated in the northern and western region of the range.

#### *Section 4(a)(1) Factors for the North Indian DPS*

Nesting beaches are degraded by light pollution and uncontrolled particulate emissions that prevent the emergence of hatchlings from their nests at some beaches.

Marine habitat is degraded as a result of trawling, dredging, siltation, land reclamation, and pollution. The legal and illegal harvest of turtles and eggs persists at several nesting beaches. Predation of eggs and hatchlings is a major threat at some nesting beaches.

Though numerous international and national regulatory mechanisms apply to the DPS, many are inadequate due to limited implementation and enforcement. Sea turtle bycatch in gill nets, trawls, and longline fisheries is a significant cause of mortality. Vessel strikes are a large and increasing threat. Beach driving causes hatchling turtles to be caught in ruts, struck, or run over. Marine debris entangles and is ingested by turtles. Sea level rise and the increased frequency and intensity of storm events, as a result of climate change, are likely to cause severe erosion to nesting beaches.

#### *Conservation Efforts for the North Indian DPS*

There are several multinational and national programs underway to protect and conserve the DPS. Most focus on protecting the nesting beaches.

#### *Extinction Risk Analysis for the North Indian DPS*

The high abundance and broadly distributed nesting beaches of the DPS provide some resilience to threats; however, nesting is relatively concentrated and declining at some beaches. The DPS is threatened by the following factors: habitat loss and degradation, harvest of turtles and eggs, predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, beach driving, boat strikes, and climate change. While conservation efforts for the North Indian DPS are extensive and expanding, they remain inadequate to ensure the long-term viability of the population. We conclude that the DPS is not presently in danger of extinction throughout all or a significant portion of its range.



Listing is warranted because resilience is limited and several of the existing threats are likely to increase. Therefore, the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

*Listing Determination for the North Indian DPS*

For the above reasons, we list the North Indian DPS as a threatened species under the ESA.

**East Indian-West Pacific DPS**

The comments that we received on the East Indian-West Pacific DPS did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the East Indian-West Pacific DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The western boundary for the range of the East Indian-West Pacific DPS is 84° E. longitude from 40° S. to where it coincides with India near Odisha, northeast along the shoreline and into the West Pacific Ocean to include Taiwan extending east at 41° N. to 146° E. longitude, south and west to 4.5° N., 129° E., then south and east to West Papua in Indonesia and the Torres Straits in Australia. The southern boundary is 40° S. latitude, encompassing the Gulf of Carpentaria.

*Demographic Parameters for the East Indian-West Pacific DPS*

The DPS exhibits high abundance, with an estimated total nester abundance of

77,009 females at 50 nesting sites. The largest nesting site (Wellesley Group in northern Australia) supports approximately 25,000 nesting females. Declines occur at several nesting sites, though others appear to be stable or increasing. There is complex and significant spatial substructure, but some mixing of turtles occurs at foraging areas. Nesting and foraging areas are widespread throughout the range of the DPS, providing some resilience through habitat diversity.

*Section 4(a)(1) Factors for the East Indian-West Pacific DPS*

The majority of nesting beaches are degraded due to tourism, coastal development, artificial lighting, sand mining, oil and gas production, and marine debris. Foraging habitat is degraded due to siltation, sewage, pollution (e.g., oil spills, agricultural runoff, and organic chemicals), commercial harvest of seagrass, trawling, dynamite and potassium cyanide fishing, and vessel anchoring. The harvest of turtles and eggs has led to declines throughout the range of the DPS. At-sea poaching is a common problem. There is rising incidence of FP. Nest and hatchling predation is prevalent. Though numerous regulatory mechanisms apply to the DPS, many are inadequately implemented and enforced. Incidental capture in artisanal and commercial fisheries (e.g., those using drift and set gill nets, bottom and mid-water trawling, fishing dredges, pound nets and weirs, and haul and purse seines) is a significant and increasing threat. Turtles ingest and become entangled in marine debris, including discarded fishing gear (e.g., Wilcox *et al.*, 2015). Climate change poses an increasing threat to the DPS through the loss of nesting habitat (due to sea level rise and increasing storm events) and the alteration of thermal sand characteristics of beaches (from warming temperatures).

### *Conservation Efforts for the East Indian-West Pacific DPS*

There are several conservation programs throughout the range of the DPS. Sanctuaries and parks protect some nesting beaches, and some marine protected areas have been established. There are bycatch reduction efforts in some areas. Several programs conduct monitoring, education, outreach, and enforcement.

### *Extinction Risk Analysis for the East Indian-West Pacific DPS*

The high nesting abundance and spatial diversity of nesting and foraging locations provide the DPS with some resilience against current threats; however, nesting trends at several sites are declining. The DPS is threatened by all section 4(a)(1) factors: habitat loss and degradation, overexploitation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, and climate change. Though beneficial, the conservation efforts do not adequately reduce threats. We conclude that the East Indian-West Pacific DPS is not presently in danger of extinction throughout all or a significant portion of its range. Listing is warranted because current and increasing threats are likely to exacerbate population declines, especially in the context of climate change. For these reasons, the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

### *Listing Determination for the East Indian-West Pacific DPS*

For the above reasons, we list the East Indian-West Pacific DPS as a threatened species under the ESA.

### **Central West Pacific DPS**

The comments that we received on the Central West Pacific DPS did not change

our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the Central West Pacific DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the Central West Pacific DPS has a northern boundary of 41° N. latitude and is bounded by 41° N., 169° E. in the northeast corner, going southeast to 9° N., 175° W., then southwest to 13° S., 171° E., west and slightly north to the eastern tip of Papua New Guinea, along the northern shore of the Island of New Guinea to West Papua in Indonesia, northwest to 4.5° N., 129° E. then to West Papua in Indonesia, then north to 41° N., 146° E. It encompasses the Republic of Palau, Federated States of Micronesia, New Guinea, Solomon Islands, Marshall Islands, Guam, CNMI, and the Ogasawara Islands of Japan.

#### *Demographic Parameters for the Central West Pacific DPS*

The DPS exhibits low nesting abundance, with an estimated total nester abundance of 6,518 females at 50 nesting sites. Nesting data indicate increasing trends at one site but decreasing trends at others. There is significant genetic substructure and limited connectivity among four independent stocks. Nesting is relatively widespread but occurs only on islands and atolls (i.e., little nesting site diversity).

#### *Section 4(a)(1) Factors for the Central West Pacific DPS*

Nesting habitat is degraded by coastal development and construction, placement of barriers to nesting, beachfront lighting, tourism, vehicular and pedestrian traffic, sand extraction, beach erosion, beach pollution, removal of native vegetation, and the presence of non-native vegetation. Destruction and modification of marine habitat occurs as a result of coastal construction, tourism, sedimentation, pollution, sewage, runoff, military activities, dredging, destructive fishing methods, and boat anchoring. The harvest of turtles and eggs is a large and persistent threat throughout the range of the DPS. Predation is a significant threat in some areas. Though there are some existing regulatory mechanisms to reduce the harvest of turtles and eggs and to prevent or reduce bycatch, implementation and enforcement are inadequate. Turtles are incidentally caught in longline, pole and line, and purse seine fisheries. Marine debris results in the mortality of sea turtles through ingestion and entanglement. Temperature increases, as a result of climate change, are the greatest long-term threat to atoll morphology in nations throughout the range of the DPS. Sea level rise is likely to reduce available nesting habitat. The increased frequency and intensity of storm events are likely to cause beach erosion and nest inundation, as demonstrated in a recent study by Summers *et al.* (in progress). However, Ford and Kench (2015, 2016) recently described shoreline accretion in the Marshall Islands, despite typhoon-driven erosion and local sea level rise.

#### *Conservation Efforts Evaluation for the Central West Pacific DPS*

Conservation efforts include programs to protect turtles, establish protected areas, and reduce beach pollution. A recent study demonstrates that turtle densities have increased by an order of magnitude in a marine protected area in Guam (Martin *et al.*,

2016).

*Extinction Risk Analysis for the Central West Pacific DPS*

The low nesting abundance, limited connectivity, and low nesting diversity provide the DPS with little resilience against current threats. Though nesting trends are increasing in some areas, they are decreasing in others. The DPS is vulnerable to the following section 4(a)(1) factors: habitat modification and destruction, overexploitation, predation, fisheries bycatch, marine debris, and climate change. Conservation efforts do not adequately reduce such threats; ESA and additional protections are essential to the continued existence of the DPS. We conclude that the DPS is in danger of extinction throughout all or a significant portion of its range.

*Listing Determination for the Central West Pacific DPS*

For the above reasons, we list the Central West Pacific DPS as an endangered species under the ESA.

**Southwest Pacific DPS**

We did not receive comments on the Southwest Pacific DPS and made no changes to our proposed listing determination. Therefore, we incorporate herein all information on the Southwest Pacific DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the Southwest Pacific DPS extends from the western boundary of

Torres Strait, to the eastern tip of Papua New Guinea and out to the offshore coordinate of 13° S., 171° E.; the eastern boundary runs from this point southeast to 40° S., 176° E.; the southern boundary runs along 40° S. from 142° E. to 176° E.; and the western boundary runs from 40° S., 142° E north to the Australian coast then follows the coast northward to the Torres Strait.

#### *Demographic Parameters for the Southwest Pacific DPS*

The DPS exhibits high nesting abundance, with an estimated total nester abundance of 83,058 females at 12 aggregated nesting sites. Three sites (all in Australia) host more than 10,000 nesting females: Raine Island, Moulter Cay, and the Capricorn and Bunker Group. Nesting data indicate slightly increasing trends. There are four regional genetic stocks, though mixing occurs at foraging areas. Nesting and foraging areas are widely dispersed.

#### *Section 4(a)(1) Factors for the Southwest Pacific DPS*

Nesting habitat has been degraded by beach erosion, artificial lighting, pollution, removal of native vegetation, and planting of non-native vegetation. Threats to foraging habitat include destructive fishing practices, channel dredging, and marine pollution. Harvest of turtles and eggs is substantial and occurs in many areas. Several species prey on eggs and hatchlings. Existing regulatory mechanisms inadequately address the incidental take of turtles, and many are not enforced at the local level. Incidental capture in artisanal and commercial fisheries (e.g., trawl, longline, drift net, and set net fisheries) is a significant threat. Vessel strikes injure or kill turtles in coastal waters. Port dredging and marine debris pose minor threats to the DPS. Climate change impacts are likely to

result in increased hatchling mortality, skewed sex ratios, range shifts, diet shifts, and loss of nesting habitat.

#### *Conservation Efforts for the Southwest Pacific DPS*

Conservation efforts for the DPS have resulted in take prohibitions, implementation of bycatch reduction devices, improvement of shark control devices, and safer dredging practices. Most nesting occurs on protected beaches, and the habitat off the largest nesting site falls within a marine protected area.

#### *Extinction Risk Analysis for the Southwest Pacific DPS*

The high nesting abundance, slightly increasing trends, and spatial diversity provide the DPS with some resilience against current threats, which include: habitat loss and degradation, overexploitation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, boat strikes, marine debris, port dredging, and climate change. Though beneficial, the conservation efforts are not sufficient to reduce all threats. We conclude that the DPS is not presently in danger of extinction throughout all or a significant portion of its range. Listing is warranted because of several continuing and increasing threats, as summarized above. As a result of such threats, we conclude that the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

#### *Listing Determination for the Southwest Pacific DPS*

For the above reasons, we list the Southwest Pacific DPS as a threatened species under the ESA.

#### **Central South Pacific DPS**



The comments that we received on the Central South Pacific DPS did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the Central South Pacific DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the DPS extends north and east of New Zealand to include a longitudinal expanse of 7,500 km, from Easter Island, Chile in the east to Fiji in the west, and encompasses American Samoa, French Polynesia, Cook Islands, Fiji, Kiribati, Tokelau, Tonga, and Tuvalu. Its open ocean polygonal boundary endpoints are (clockwise from the northwest-most extent): 9° N., 175° W. to 9° N., 125° W. to 40° S., 96° W. to 40° S., 176° E., to 13° S., 171° E., and back to 9° N., 175° W.

#### *Demographic Parameters for the Central South Pacific DPS*

The DPS exhibits low nesting abundance, with an estimated total nester abundance of 2,677 to 3,600 nesting females at 59 nesting sites. There is a negative nesting trend at the most abundant nesting site but increasing trends at less abundant nesting beaches. There are at least two genetic stocks within the DPS. Nesting is geographically broad, but there is little diversity of nesting sites, with most nesting occurring on low-lying coral atolls or oceanic islands.

#### *Section 4(a)(1) Factors for the Central South Pacific DPS*

Some nesting beaches are degraded by coastal erosion, development, construction, sand extraction, artificial lighting, proximity to road traffic, and natural disasters, such as tsunamis. Marine habitat is degraded by runoff, sedimentation, dredging, ship groundings, natural disasters, and pollution (e.g., oil spills, toxic and industrial wastes, and heavy metals). Commercial and traditional exploitation of turtles and eggs has resulted in declines at the most abundant nesting site and other locations. Illegal harvest of turtles and eggs is also a major threat. Predation by introduced species is a significant threat in some areas. Regulatory mechanisms are inadequate to curb the continued loss and degradation of habitat and the harvest of turtles and eggs. Incidental capture in artisanal and commercial fisheries (e.g., line, trap, and net fisheries) is a significant threat to the DPS. The primary gear types involved in these interactions include longlines, traps, and nets. Injury and mortality result from the entanglement in and ingestion of plastics, monofilament fishing line, and other marine debris (e.g., Wedemeyer-Strombel *et al.*, 2015). Islands within the South Pacific are especially vulnerable to sea level rise, which together with increasing storm events, is likely to reduce available nesting habitat.

#### *Conservation Efforts for the Central South Pacific DPS*

Conservation efforts throughout the region, such as establishment of protected areas and national legislation to protect turtles, provide some benefits to the DPS. The remoteness of some areas appears to provide the most conservation protection against certain threats, such as poaching.

#### *Extinction Risk Analysis for the Central South Pacific DPS*

The low nesting abundance, decreasing nesting trends at the largest nesting site, and low nesting diversity provide the DPS with little resilience against current threats. Though nesting trends are increasing at some less abundant nesting beaches, such trends provide little additional resilience to the DPS. Therefore, the DPS is vulnerable to the following section 4(a)(1) factors: habitat loss and degradation, overexploitation, predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, and climate change. Conservation efforts do not adequately reduce such threats; ESA and additional protections are essential to the continued existence of the DPS. We conclude that the DPS is in danger of extinction throughout all or a significant portion of its range.

*Listing Determination for the Central South Pacific DPS*

For the above reasons, we list the Central South Pacific DPS as an endangered species under the ESA.

**Central North Pacific DPS**

The comments that we received on the Central North Pacific DPS did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the Central North Pacific DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the Central North Pacific DPS includes the Hawaiian Archipelago and Johnston Atoll. It is bounded by a four-sided polygon with open ocean extents

reaching to 41° N., 169° E. in the northwest corner, 41° N., 143° W. in the northeast, 9° N., 125° W. in southeast, and 9° N., 175° W. in the southwest.

#### *Demographic Parameters for the Central North Pacific DPS*

The DPS exhibits low nesting abundance, with an estimated total nester abundance of 3,846 nesting females at 13 nesting sites. The most recent published study on this DPS estimates the total nester abundance at roughly 4,000 nesting females (Balazs *et al.*, 2015). The nesting trend is increasing. Nesting site diversity is extremely limited: 96 percent of nesting occurs at one low-lying atoll (i.e., FFS).

#### *Section 4(a)(1) Factors for the Central North Pacific DPS*

In the MHI, nesting and basking habitats are degraded by coastal development and construction, vehicular and pedestrian traffic, beach pollution, tourism, and other human related activities. Foraging habitat is degraded by coastal development, marina construction, siltation, pollution, sewage, military activities, vessel traffic, and vessel groundings. As stated in a recent study, FP continues to cause the majority of green turtle strandings in Hawai‘i (Work *et al.*, 2015) and may be linked to environmental factors (Keller *et al.*, 2014; Van Houtan *et al.*, 2014; Work *et al.*, 2014; NMFS, in progress). Numerous native and non-native predators prey on hatchlings and eggs. Existing regulatory mechanisms do not adequately address the threat of bycatch in international fisheries. In addition to incidental capture in foreign longline fisheries, interactions with nearshore recreational fisheries occur (Work *et al.*, 2015). Marine debris is a significant threat (e.g., Wedemeyer-Strombel *et al.*, 2015); entanglement in lost or discarded fishing gear is the second leading cause of strandings and mortality in the MHI (Work *et al.*,

2015). Vessel strikes result in injury and mortality. Vessel traffic excludes turtles from their preferred foraging areas. The extremely limited nesting diversity (i.e., 96 percent of nesting at FFS) increases extinction risk by rendering the DPS vulnerable to random variation and environmental stochasticities. In addition, climate change impacts threaten the DPS. Sea level rise and the increasing frequency and intensity of storm events are likely to reduce available nesting habitat. A recent study indicated that increasing temperatures are likely to modify beach thermal regimes that are important to nesting and basking (Van Houtan *et al.*, 2015). Temperature increases are also likely to result in increased hatchling mortality, skewed sex ratios, and changes in juvenile and adult distribution patterns.

#### *Conservation Efforts for the Central North Pacific DPS*

Overall, State and Federal conservation efforts have been successful in countering some threats. Important State initiatives include the regulation of gill net fishing and the distribution of barbless circle hooks.

#### *Extinction Risk Analysis for the Central North Pacific DPS*

Though the low nesting abundance and extremely limited nesting diversity render the DPS vulnerable to several threats, the increasing nesting trend at FFS provides some resilience. The DPS is threatened by the following section 4(a)(1) factors: present and threatened habitat loss and degradation, disease and predation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, vessel activities, limited spatial diversity, and climate change. Though beneficial, the conservation efforts are not sufficient to reduce all threats. We conclude that the DPS is not presently in danger of extinction

throughout all or a significant portion of its range. Listing is warranted because of numerous continuing and increasing threats, which would be further exacerbated if ESA protections were lost. We conclude that the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

*Listing Determination for the Central North Pacific DPS*

For the above reasons, we list the Central North Pacific DPS as a threatened species under the ESA.

**East Pacific DPS**

The comments that we received on the East Pacific DPS did not change our conclusions regarding its listing determination. Therefore, we incorporate herein all information on the East Pacific DPS provided in the Status Review Report and proposed rule, with the exception of the application of the critical risk threshold from the Status Review Report, which does not directly correlate with the ESA definitions of “endangered” and “threatened,” as explained in the proposed rule. The following represents a brief summary of that information.

The range of the DPS extends from 41° N southward along the Pacific coast of the Americas to central Chile (40° S) and westward to 142°W and 96°W, respectively. The offshore boundary of this DPS is a straight line between these two coordinates. The East Pacific DPS includes the Mexican Pacific coast breeding population, which was originally listed as endangered (43 FR 32800, July 28, 1978).

*Demographic Parameters for the East Pacific DPS*

The DPS exhibits an estimated total nester abundance of 20,112 females at 39

nesting sites. The largest nesting aggregation (Colola, Michoacán, Mexico) hosts more than 10,000 nesting females. Nesting data indicate increasing trends in recent decades. Within the DPS, there is additional substructure, and four regional genetic stocks have been identified; however, stocks mix at foraging areas. Nesting occurs at both insular and continental sites, providing some spatial diversity.

#### *Section 4(a)(1) Factors for the East Pacific DPS*

Some nesting beaches are degraded by coastal development, tourism, and pedestrian traffic. Some foraging areas exhibit high levels of contaminants and reduced seagrass communities. As described by Senko *et al.* (2014), the direct harvest of turtles is a significant source of mortality. The legal and illegal harvest of eggs is a significant threat due to high demand and lack of enforcement of existing protections. Predation by dogs results in egg and hatchling mortality (Ruiz-Izaguirre *et al.*, 2015; Santidrián Tomillo *et al.*, 2015). Existing regulatory mechanisms inadequately regulate egg poaching, the destruction of nesting habitat, and fisheries bycatch. Incidental capture in artisanal and commercial fisheries (e.g., longline, drift gill net, set gill net, and trawl fisheries) is a significant threat. Other threats include marine debris ingestion, boat strikes, and red tide poisoning, which may result in a UME. Climate change is likely to impact nesting and hatchling success. In a recent study, Rhodes (2015) found that females laid fewer nests in areas characterized by erosion and tidal inundation (two likely impacts of sea level rise).

#### *Conservation Efforts for the East Pacific DPS*

Conservation initiatives include broad regional efforts and national programs,

such as the National Programme for the Conservation of Marine and Continental Turtles in Colombia, which provides education, conservation, and outreach plans. Marine reserves protect green turtles and their foraging habitat.

#### *Extinction Risk Analysis for the East Pacific DPS*

The increasing trends and spatial diversity provide the DPS with some resilience against current threats; the nesting abundance, though not high, may be large enough to avoid depensation and other risks associated with small population size. The DPS is threatened by the following section 4(a)(1) factors: habitat loss and degradation, overexploitation, inadequate regulatory mechanisms, fisheries bycatch, marine debris, boat strikes, red tide poisoning, and climate change. Though beneficial, conservation efforts are not sufficient to adequately reduce threats. We conclude that the DPS is not presently in danger of extinction throughout all or a significant portion of its range. Listing is warranted because significant threats (e.g., egg poaching) continue and others (e.g., climate change) are increasing. The loss of ESA protections would further exacerbate several threats. We conclude that the DPS is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

#### *Listing Determination for the East Pacific DPS*

For the above reasons, we list the East Pacific DPS as a threatened species under the ESA.

#### **Final Determination**

We reviewed the best available scientific and commercial information, including the information in the Status Review Report, the comments of peer reviewers, public



comments, and information that has become available since the publication of the proposed rule. We identified 11 green turtle DPSs: North Atlantic, Mediterranean, South Atlantic, Southwest Indian, North Indian, East Indian-West Pacific, Central West Pacific, Southwest Pacific, Central South Pacific, Central North Pacific, and East Pacific. For each DPS, we reviewed the demographic parameters and section 4(a)(1) factors, performed an extinction risk analysis, and considered conservation efforts. We determined that the Mediterranean, Central West Pacific, and Central South Pacific DPSs are endangered species, and the following DPSs are threatened species: North Atlantic, South Atlantic, Southwest Indian, North Indian, East Indian-West Pacific, Southwest Pacific, Central North Pacific, and East Pacific. We hereby replace the original listings for the species and breeding populations in Florida and the Pacific coast of Mexico with listings of the 11 threatened or endangered DPSs.

### **Significant Portion of the Range**

Under the ESA and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. See the Final Policy on Interpretation of the Phrase “Significant Portion of Its Range” in the Endangered Species Act’s Definitions of “Endangered Species” and “Threatened Species” (79 FR 37577, July 1, 2014). Under that policy, we only need to consider whether listing may be appropriate on the basis of the “significant portion of its range” language if the rangewide analysis does not lead to a threatened or endangered listing determination. Because we have determined that each green turtle DPS is either threatened or endangered throughout all of its range, no portion of its range can be

"significant" for purposes of the definitions of "endangered species" and "threatened species."

### **Effects of Listing**

Conservation benefits for species listed as endangered or threatened under the ESA include: recovery plans and actions (16 U.S.C. 1533(f)); designation of critical habitat if prudent and determinable (16 U.S.C. 1533(a)(3)(A)(i)); the requirement that Federal agencies consult with the Services to ensure that their actions are not likely to jeopardize species or result in adverse modification or destruction of critical habitat, should it be designated (16 U.S.C. 1536(a)(2)); and prohibitions against take and certain other activities (16 U.S.C. 1538). In addition, recognition of the species' status through listing promotes conservation actions by Federal and State agencies, foreign entities, conservation organizations, and individuals.

### *Identifying Section 7(a)(2) Consultation Requirements*

Section 7(a)(2) of the ESA requires Federal agencies to consult with the relevant Service(s) to insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat (16 U.S.C. 1536(a)(2)). The ESA requires consultation for any Federal action that may affect green turtles, which have been listed under the ESA since 1978. This will not change with the listing of the DPSs (i.e., consultation is required for any Federal action that may affect any of the green turtle DPSs). Reinitiation of consultation is required for any action that may affect one or more newly listed DPS. Federal agencies must insure that any action they authorize, fund, or carry out is not

likely to jeopardize the continued existence of any green turtle DPS. Examples of Federally authorized, funded, or implemented actions that affect green turtles include, but are not limited to: dredging and channelization, beach nourishment and nearshore construction, pile-driving, water quality standards, oil and gas exploration and extraction, power plant operations, vessel activities, military activities, and fisheries management practices.

### *Critical Habitat*

Section 3 of the ESA defines critical habitat as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance [with the ESA], on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed in accordance [with the ESA] upon a determination by the Services that such areas are essential for the conservation of the species (16 U.S.C. 1532(5)). Section 4(a)(3)(A) requires us to designate critical habitat to the maximum extent prudent and determinable and concurrently with a listing determination (16 U.S.C. 1533(a)(3)(A)(i)), unless as described in section 4(b)(6)(C), critical habitat is not then determinable, in which case we may take an additional year to publish the final critical habitat determination (16 U.S.C. 1533(b)(6)(C)(ii)). The implementing regulations state that critical habitat shall not be designated within foreign countries or in other areas outside of U.S. jurisdiction (50 CFR 424.12 (h)). The ranges of six DPSs occur within U.S. jurisdiction: North Atlantic, South Atlantic, East Pacific, Central North Pacific,

Central South Pacific, and Central West Pacific. We are currently evaluating the areas that contain physical and biological features that are essential to the DPSs and may require special management considerations or protection, but critical habitat is not determinable at this time. Therefore, we will propose critical habitat in a future rulemaking. As discussed in the proposed rule, designated critical habitat, in waters surrounding Culebra Island, Puerto Rico, from the mean high water line seaward to 3 nautical miles (5.6 km; 63 FR 46693, September 2, 1998), remains in effect for the North Atlantic DPS.

#### *Take Prohibitions*

All prohibitions in section 9(a)(1) of the ESA (16 U.S.C. 1538(a)(1)) apply automatically under the statute to the three endangered DPSs: Mediterranean, Central West Pacific and Central South Pacific. These include prohibitions against importing, exporting, engaging in foreign or interstate commerce, or “taking” of the species. “Take” is defined under the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” (16 U.S.C. 1532(19)). These prohibitions apply to any “person” (as defined by the ESA) subject to the jurisdiction of the United States, including within the United States, its territorial seas, or on the high seas. Certain exceptions apply to employees of the Services, other Federal land management agencies, and State conservation agencies. In addition, longstanding requirements for fishing activities to protect endangered sea turtles apply to these DPSs (50 CFR 224.104) and are not affected by this rule.

Section 4(d) of the ESA authorizes us to issue regulations that we deem necessary

and advisable to provide for the conservation of threatened species (16 U.S.C. 1533(d)). As discussed in the proposed rule, the longstanding protective regulations (50 CFR 17.42(b), 223.205, 223.206, and 223.207) remain in effect and continue to apply section 9 prohibitions to threatened species of sea turtles, which include the North Atlantic, South Atlantic, Southwest Indian, North Indian, East Indian-West Pacific, Southwest Pacific, Central North Pacific, and East Pacific DPSs. The specific content of those provisions is beyond the scope of this rulemaking and is unaffected by this rulemaking.

Pursuant to section 10 of the ESA, we may issue permits to carry out activities otherwise prohibited by section 9 for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities (16 U.S.C. 1539(a)(1)). For threatened species, we may also issue permits for education and zoological exhibition (50 CFR 17.32(a)(1); 50 CFR 223.206(a)(1)).

*Identification of Those Activities That Would Likely Constitute a Violation of Section 9 of the ESA*

On July 1, 1994, we published a policy (59 FR 34272) that requires us to identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not likely constitute a violation of section 9 of the ESA. The intent of this policy is to increase public awareness of the effect of a listing on proposed and ongoing activities within a species' range. Activities likely to violate section 9 include, but are not limited to: (1) importation or exportation of any part of a green turtle or green turtle eggs; (2) directed take of green turtles, including fishing for, capturing, handling, or possessing green turtles, eggs, or parts; (3) sale of green turtles, eggs, or parts in interstate

commerce; (4) modification or degradation of green turtle habitat, including nesting beaches, beaches used for basking, and developmental, foraging habitat, and migratory habitat that actually kills or injures green turtles (i.e., harm, 50 CFR 222.102); and (5) indirect take of green turtles in the course of otherwise lawful activities, such as fishing, dredging, beach nourishment, coastal construction, vessel traffic, and discharge of pollutants. Whether a particular activity violates section 9 depends upon the facts and circumstances of each incident. Because the green turtle has been listed under the ESA since 1978, we do not anticipate changes in the activities that would constitute a violation of section 9. Possible exceptions include those actions affecting the Mediterranean, Central West Pacific, and Central South Pacific DPSs, which are now listed as endangered, and the breeding populations in Florida and the Pacific coast of Mexico, which were heretofore listed as endangered. For example, the Services may issue permits for the educational use and zoological exhibition of threatened, but not endangered, sea turtles (50 CFR 17.32(a)(1); 50 CFR 223.206(a)(1)).

Activities not likely to violate section 9 of the ESA may include: take authorized by and carried out in accordance with the terms and conditions of an ESA section 10(a)(1)(A) permit; and continued possession of parts that were in possession at the time of the original listing (i.e., 1978).

### **Peer Review**

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review, establishing minimum peer review standards, a transparent process for public disclosure of peer review planning, and

opportunities for public participation. The OMB Bulletin, implemented under the Information Quality Act (Pub. L. 106-554), is intended to enhance the quality and credibility of the Federal government's scientific information and applies to influential or highly influential scientific information disseminated on or after June 16, 2005. To satisfy our requirements under the OMB Bulletin, we obtained independent peer review of the Status Review Report by 15 independent scientists with expertise in green turtle biology and genetics, endangered species listing policy, and related fields. All peer reviewer comments were addressed prior to the publication of the Status Review Report and proposed rule.

## **References**

A complete list of the references is available at:

<http://www.nmfs.noaa.gov/pr/species/turtles/green.htm>.

## **Classification**

### *National Environmental Policy Act*

The 1982 amendments to section 4(b)(1)(A) of the ESA restrict the information that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in *Pacific Legal Foundation v. Andrus*, 657 F. 2d 829 (6th Cir. 1981), NMFS has concluded that ESA listing actions are not subject to the requirements of the National Environmental Policy Act. See NOAA Administrative Order 216-6. Similarly, USFWS has determined that environmental assessments and environmental impact statements, as defined under the authority of the National

Environmental Policy Act, need not be prepared in connection with regulations pursuant to section 4(a) of the ESA (48 FR 49244, October 25, 1983).

*Executive Order 12866, Regulatory Flexibility Act, and Paperwork Reduction Act*

As noted in the Conference Report on the 1982 amendments to the ESA, economic impacts cannot be considered when assessing the status of a species. Therefore, the economic analysis requirements of the Regulatory Flexibility Act are not applicable to the listing process. In addition, this final rule is exempt from review under Executive Order 12866. This final rule does not contain a collection-of-information requirement for the purposes of the Paperwork Reduction Act.

*Executive Order 13132, Federalism*

In accordance with Executive Order 13132, we determined that this final rule does not have significant Federalism effects and that a Federalism assessment is not required.

**List of Subjects**

*50 CFR Part 17*

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

*50 CFR Parts 223 and 224*

Endangered and threatened species, Exports, Imports, Transportation.



Dated: March 29, 2016

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Eileen Sobeck,  
Assistant Administrator for Fisheries,  
National Marine Fisheries Service.

Dated: March 15, 2016

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Stephen Guertin  
Acting Director,  
U.S. Fish and Wildlife Service.

For the reasons set out in the preamble, 50 CFR parts 17, 223, and 224 are amended as follows:

**PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS**

1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361-1407; 1531-1544; and 4201-4245, unless otherwise noted.

2. In §17.11(h), under REPTILES, remove both entries for “Sea turtle, green” and add in their place the eleven entries for "Sea turtle, green" set forth below:

**§ 17.11 Endangered and threatened wildlife.**

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(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*****							
REPTILES							

*****  Sea turtle, green (Central North Pacific DPS)	<i>Chelonia mydas</i>	Central North Pacific Ocean	Green sea turtles originating from the Central North Pacific Ocean, bounded by the following coordinates: 41° N., 169° E. in the northwest; 41° N., 143° W. in the northeast; 9° N., 125° W. in the southeast; and 9° N., 175° W. in the southwest.	T	863	NA	17.42(b), 223.205, 223.206, 223.207
Sea turtle, green (Central South Pacific DPS)	<i>Chelonia mydas</i>	Central South Pacific Ocean	Green sea turtles originating from the Central South Pacific Ocean, bounded by the following coordinates: 9° N., 175° W. in the northwest; 9° N., 125° W. in the northeast; 40° S., 96° W. in the southeast; 40° S., 176° E. in the southwest; and 13° S., 171° E. in the west.	E	863	NA	224.104
Sea turtle, green (Central West Pacific DPS)	<i>Chelonia mydas</i>	Central West Pacific Ocean	Green sea turtles originating from the Central West Pacific Ocean, bounded by the following coordinates: 41° N., 146° E. in the northwest; 41° N., 169° E. in the northeast; 9° N., 175° W. in the east; 13° S., 171° E. in the southeast; along the northern coast of the island of New Guinea; and 4.5° N., 129°	E	863	NA	224.104

			E. in the west.				
Sea turtle, green (East Indian-West Pacific DPS)	<i>Chelonia mydas</i>	Eastern Indian and Western Pacific Oceans	Green sea turtles originating from the Eastern Indian and Western Pacific Oceans, bounded by the following lines and coordinates: 41° N. Lat. in the north, 41° N., 146° E. in the northeast; 4.5° N., 129° E. in the southeast; along the southern coast of the island of New Guinea; along the western coast of Australia (west of 142° E. Long.); 40° S. Lat. in the south; and 84° E. Long. in the east.	T	863	NA	17.42(b), 223.205, 223.206, 223.207
Sea turtle, green (East Pacific DPS)	<i>Chelonia mydas</i>	East Pacific Ocean	Green sea turtles originating from the East Pacific Ocean, bounded by the following lines and coordinates: 41° N., 143° W. in the northwest; 41° N. Lat. in the north; along the western coasts of the Americas; 40° S. Lat. in the south; and 40° S., 96° W. in the southwest.	T	863	NA	17.42(b), 223.205, 223.206, 223.207
Sea turtle, green (Mediterranean DPS)	<i>Chelonia mydas</i>	Mediterranean Sea	Green sea turtles originating from the Mediterranean Sea, bounded by 5.5° W. Long. in the west.	E	863	NA	224.104

Sea turtle, green (North Atlantic DPS)	<i>Chelonia mydas</i>	North Atlantic Ocean	Green sea turtles originating from the North Atlantic Ocean, bounded by the following lines and coordinates: 48° N. Lat. in the north, along the western coasts of Europe and Africa (west of 5.5° W. Long.); north of 19° N. Lat. in the east; bounded by 19° N., 65.1° W. to 14° N., 65.1° W. then 14° N., 77° W. in the south and west; and along the eastern coasts of the Americas (north of 7.5° N., 77° W.).	T	863	226.208	17.42(b), 223.205, 223.206, 223.207
Sea turtle, green (North Indian DPS)	<i>Chelonia mydas</i>	North Indian Ocean	Green sea turtles originating from the North Indian Ocean, bounded by: Africa and Asia in the west and north; 84° E. Long. in the east; and the equator in the south.	T	863	NA	17.42(b), 223.205, 223.206, 223.207
Sea turtle, green (South Atlantic DPS)	<i>Chelonia mydas</i>	South Atlantic Ocean	Green sea turtles originating from the South Atlantic Ocean, bounded by the following lines and coordinates: along the northern and eastern coasts of South America (east of 7.5° N., 77° W.); 14° N., 77° W. to 14°	T	863	NA	17.42(b), 223.205, 223.206, 223.207

			N., 65.1° W. to 19° N., 65.1° W. in the north and west; 19° N. Lat. in the northeast; 40° S., 19° E. in the southeast; and 40° S. Lat. in the south.				
Sea turtle, green (Southwest Indian DPS)	<i>Chelonia mydas</i>	Southwest Indian Ocean	Green sea turtles originating from the Southwest Indian Ocean, bounded by the following lines: the equator to the north; 84° E. Long. to the east; 40° S. Lat. to the south; and 19° E. Long (and along the eastern coast of Africa) in the west.	T	863	NA	17.42(b), 223.205, 223.206, 223.207
Sea turtle, green (Southwest Pacific DPS)	<i>Chelonia mydas</i>	Southwest Pacific Ocean	Green sea turtles originating from the Southwest Pacific Ocean, bounded by the following lines and coordinates: along the southern coast of the island of New Guinea and the Torres Strait (east of 142° E Long.); 13° S., 171° E. in the northeast; 40° S., 176° E. in the southeast; and 40° S., 142° E. in the southwest.	T	863	NA	17.42(b), 223.205, 223.206, 223.207
*****							

**PART 223—THREATENED MARINE AND ANADROMOUS SPECIES**

3. The authority citation for part 223 continues to read as follows:

**Authority:** 16 U.S.C. 1531-1543; subpart B, § 223.201-202 also issued under 16 U.S.C. 1361 *et seq.*; 16 U.S.C. 5503(d) for § 223.206(d)(9).

4. Amend the table in § 223.102(e) by removing the entry for “Sea turtle, green” and adding in its place the eight entries for

"Sea turtle, green" under Reptiles to read as follows:

**§ 223.102 Enumeration of threatened marine and anadromous species.**

\* \* \* \* \*

(e) \* \* \*

Species <sup>1</sup>			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
*****					
Reptiles <sup>2</sup>					
Sea turtle, green (Central North Pacific DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the Central North Pacific Ocean, bounded by the following coordinates: 41° N., 169° E. in the northwest; 41° N., 143° W. in the northeast; 9° N., 125° W. in the southeast; and 9° N., 175° W in the southwest.	81 FR [Insert <b>FEDERAL REGISTER</b> page where the document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER</b> ]	NA	223.205, 223.206, 223.207.
Sea turtle, green (East Indian-West Pacific DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the Eastern Indian and Western Pacific Oceans, bounded by the following lines and coordinates: 41° N. Lat. in the north, 41° N., 146° E. in the northeast; 4.5° N., 129° E. in the southeast; along the southern coast of the island of New	81 FR [Insert <b>FEDERAL REGISTER</b> page where the document begins], [Insert date of publication when published in the	NA	223.205, 223.206, 223.207.



		Guinea; along the western coast of Australia (west of 142° E. Long.); 40° S. Lat. in the south; and 84° E. Long. in the east.	<b>FEDERAL REGISTER]</b>		
Sea turtle, green (East Pacific DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the East Pacific Ocean, bounded by the following lines and coordinates: 41° N., 143° W. in the northwest; 41° N. Lat. in the north; along the western coasts of the Americas; 40° S. Lat. in the south; and 40° S., 96° W. in the southwest.	81 FR [ <i>Insert FEDERAL REGISTER page where the document begins</i> ], [ <i>Insert date of publication when published in the FEDERAL REGISTER</i> ]	NA	223.205, 223.206, 223.207.
Sea turtle, green (North Atlantic DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the North Atlantic Ocean, bounded by the following lines and coordinates: 48° N. Lat. in the north, along the western coasts of Europe and Africa (west of 5.5° W. Long.); north of 19° N. Lat. in the east; bounded by 19° N., 65.1° W. to 14° N., 65.1° W. then 14° N., 77° W. in the south and west; and along the eastern coasts of the Americas (north of 7.5° N., 77° W.).	81 FR [ <i>Insert FEDERAL REGISTER page where the document begins</i> ], [ <i>Insert date of publication when published in the FEDERAL REGISTER</i> ]	226.208	223.205, 223.206, 223.207.

Sea turtle, green (North Indian DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the North Indian Ocean, bounded by: Africa and Asia in the west and north; 84° E. Long. in the east; and the equator in the south.	81 FR [Insert <b>FEDERAL REGISTER</b> page where the document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER</b> ]	NA	223.205, 223.206, 223.207.
Sea turtle, green (South Atlantic DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the South Atlantic Ocean, bounded by the following lines and coordinates: along the northern and eastern coasts of South America (east of 7.5° N., 77° W.); 14° N., 77° W. to 14° N., 65.1° W. to 19° N., 65.1° W. in the north and west; 19° N. Lat. in the northeast; 40° S., 19° E. in the southeast; and 40° S. Lat. in the south.	81 FR [Insert <b>FEDERAL REGISTER</b> page where the document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER</b> ]	NA	223.205, 223.206, 223.207.
Sea turtle, green (Southwest Indian DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the Southwest Indian Ocean, bounded by the following lines: the equator to the north;	81 FR [Insert <b>FEDERAL REGISTER</b> page where the	NA	223.205, 223.206, 223.207.

<p>Sea turtle, green (Southwest Pacific DPS)</p> <p>*****</p>	<p><i>Chelonia mydas</i></p>	<p>84° E. Long. to the east; 40° S. Lat. to the south; and 19° E. Long (and along the eastern coast of Africa) in the west.</p> <p>Green sea turtles originating from the Southwest Pacific Ocean, bounded by the following lines and coordinates: along the southern coast of the island of New Guinea and the Torres Strait (east of 142° E Long.); 13° S., 171° E. in the northeast; 40° S., 176° E. in the southeast; and 40° S., 142° E. in the southwest.</p>	<p><i>document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER]</b></i></p> <p>81 FR <i>[Insert <b>FEDERAL REGISTER</b> page where the document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER]</b></i></p>	<p>NA</p>	<p>223.205, 223.206, 223.207.</p>
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<sup>1</sup> Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

<sup>2</sup> Jurisdiction for sea turtles by the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, is limited to turtles while in the water.

**PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES**

5. The authority citation for part 224 continues to read as follows:

**Authority:** 16 U.S.C. 1531–1543 and 16 U.S.C. 1361 *et seq.*

6. Amend § 224.101(h) by removing the entry for “Sea turtle, green” and adding in its place the three entries for "Sea turtle, green" under Reptiles to read as follows:

**§ 224.101 Enumeration of endangered marine and anadromous species.**

\* \* \* \* \*

(h) \* \* \*

Species <sup>1</sup>			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
*****					
Reptiles <sup>2</sup>					
Sea turtle, green (Central South Pacific DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the Central South Pacific Ocean, bounded by the following coordinates: 9° N., 175° W. in the northwest; 9° N., 125° W. in the northeast; 40° S.,	81 FR [ <i>Insert FEDERAL REGISTER page where the document begins</i> ], [ <i>Insert date of publication when published in the FEDERAL</i>	NA	224.104.

		96° W. in the southeast; 40° S., 176° E. in the southwest; and 13° S., 171° E. in the west.	<b>REGISTER]</b>		
Sea turtle, green (Central West Pacific DPS)	<i>Chelonia mydas</i>	Green sea turtles originating from the Central West Pacific Ocean, bounded by the following coordinates: 41° N., 146° E. in the northwest; 41° N., 169° E. in the northeast; 9° N., 175° W. in the east; 13° S., 171° E. in the southeast; along the northern coast of the island of New Guinea; and 4.5° N., 129° E. in the west.	81 FR [Insert <b>FEDERAL REGISTER</b> page where the document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER]</b>	NA	224.104.
Sea turtle, green (Mediterranean)	<i>Chelonia mydas</i>	Green sea turtles originating from the	81 FR [Insert <b>FEDERAL REGISTER</b>	NA	224.104.

DPS)		Mediterranean Sea, bounded by 5.5° W. Long. in the west.	<i>page where the document begins], [Insert date of publication when published in the <b>FEDERAL REGISTER]</b></i>		
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<sup>1</sup> Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

<sup>2</sup> Jurisdiction for sea turtles by the Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, is limited to turtles while in the water.

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