Avenue SE, Washington, DC 20590, between 9 a.m. and 5 p.m., ET, Monday through Friday, except Federal holidays.

Privacy Act

Under 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its potential rulemaking process. DOT posts these comments, without edit, including any personal information the commenter provides, to *www.regulations.gov,* as described in the system of records notice (DOT/ALL–14 FDMS), which can be reviewed at *www.dot.gov/privacy.*

Background

The August 23, 2018 ANPRM (83 FR 42631) asked for public comment on four subject areas: Short haul operations, adverse conditions, the 30-minute break, and the split-sleeper berth provision. The ANPRM also sought public comment on two petitions for rulemaking from the Owner-Operator Independent Drivers Association (OOIDA) and TruckerNation.

FMCSA held a public listening session on August 24, 2018, at the Great American Truck Show, in Dallas, Texas (83 FR 42630).

Extension of the Public Comment Period

The comment period for the ANPRM was set to expire on September 24, 2018 (83 FR 42631). FMCSA received several requests to extend the comment period, as noted above. Copies of the requests are included in the docket referenced at the beginning of this notice.

The organizations requested various lengths of time for the extension ranging from 30 to 60 days, stating that the additional time was needed to enable them to prepare more comprehensive responses based on research and information that has only recently been released or is expected to be released at upcoming industry meetings.

FMCSA has determined that extending the comment period would provide the organizations additional time to prepare more detailed comments that are reflective of the concerns of their members. Accordingly, FMCSA extends the comment period for all comments on the ANPRM to October 10, 2018.

Issued under the authority of delegations in 49 CFR 1.87: September 14, 2018.

Cathy F. Gautreaux,

Deputy Administrator.

[FR Doc. 2018–20430 Filed 9–19–18; 8:45 am]

BILLING CODE 4910–EX–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 180503449–8782–01]

RIN 0648–XG232

Endangered and Threatened Wildlife; Positive 90-Day Finding on a Petition To List the Cauliflower Coral, Pocillopora Meandrina, in Hawaii as Endangered or Threatened Under the Endangered Species Act

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce.

ACTION: 90-day petition finding, request for information, and initiation of status review.

SUMMARY: We, NMFS, announce a 90-day finding on a petition to list the cauliflower coral (*Pocillopora meandrina)* in Hawaii as an endangered or threatened species under the Endangered Species Act (ESA). The petition requested that the Hawaii population of *P. meandrina* be considered a significant portion of the range of the species, and that the species be listed because of its status in Hawaii. Our policy on the interpretation of the phrase ''Significant Portion of Its Range'' (SPR) under the ESA states that, before undergoing an SPR analysis, we must first find that the species is neither endangered nor threatened throughout all of its range. Therefore, we interpret the petition as a request to consider the status of *P. meandrina* throughout its range first. We find that the petition and other readily available information in our files indicates that *P. meandrina* may warrant listing as a threatened species or an endangered species throughout its range. Thus, we will initiate a global status review of *P. meandrina* to determine whether listing it throughout its range is warranted. If not, we will determine if Hawaii constitutes an SPR, and proceed accordingly. To ensure that the status review is comprehensive, we are soliciting scientific and commercial information pertaining to *P. meandrina* from any interested party.

DATES: Information and comments on the subject action must be received by November 19, 2018.

ADDRESSES: You may submit comments, information, or data on this document, identified by the code NOAA–NMFS–2018–0060, by either of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal. Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2018-0060.* Click the ''Comment Now'' icon, complete the required fields, and enter or attach your comments.
- *Mail:* Submit written comments to Lance Smith, NOAA IRC, NMFS/PIRO/PRD, 1845 Wasp Blvd., Bldg. 176, Honolulu, HI 96818.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

Copies of the petition and related materials are available on our website at *http://www.fisheries.noaa.gov/species/Pocillopora-meandrina.*

FOR FURTHER INFORMATION CONTACT: Lance Smith, NMFS, Pacific Islands Regional Office, Protected Resources Division, (808) 725–5131; or Chelsey Young, NMFS, Office of Protected Resources, 301–427–8403.

SUPPLEMENTARY INFORMATION:

Background

On March 14, 2018, we received a petition from the Center for Biological Diversity to list the cauliflower coral (*Pocillopora meandrina*) in Hawaii as an endangered or threatened species under the ESA. The petition asserts that *P. meandrina* in Hawaii is threatened by at least four of the five ESA section 4(a)(1) factors: (1) Pesent modification of its habitat; (2) disease and predation; (3) inadequacy of existing regulatory mechanisms: and (4) other natural or manmade factors, specifically ocean warming and ocean acidification resulting from global climate change. Copies of the petition are available upon request (see **ADDRESSES**).

ESA Statutory, Regulatory, and Policy Provisions and Evaluation Framework

Section 4(b)(3)(A) of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*), requires, to the maximum extent practicable, that within 90 days of receipt of a petition to list a species as threatened or endangered, the Secretary of Commerce make a finding on whether that petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted, and promptly publish such finding in the **Federal Register** (16 U.S.C. 1533(b)(3)(A)). When it is found that substantial scientific or commercial information in a petition indicates the petitioned action may be warranted (a ''positive 90-day finding''), we are required to commence a comprehensive review of the status of the species concerned using the best available scientific and commercial information, which we will conclude with a finding as to whether, in fact, the petitioned action is warranted. This finding is due within 12 months of receipt of the petition. Because the finding at the 12-month stage is based on a more thorough review of the available information, compared to the narrow scope of review at the 90-day stage, a ''may be warranted'' 90-day finding does not prejudge the outcome of the 12-month finding.

ESA-implementing regulations issued jointly by NMFS and USFWS (50 CFR 424.14(h)(1)(i)) define ''substantial scientific or commercial information'' in the context of reviewing a petition to list, delist, or reclassify a species as credible scientific or commercial information in support of the petition's claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted. Conclusions drawn in the petition without the support of credible scientific or commercial information will not be considered ''substantial information.'' In evaluating whether substantial information is contained in the petition, we consider whether the petition (1) Clearly indicates the administrative measure recommended and gives the scientific and any common name of the species involved; (2) contains a detailed narrative justification for the recommended measure, describing, based on available information, past and present numbers and distribution of the species involved and any threats faced by the species; (3) provides information regarding the status of the species over all or a significant portion of its range; and (4) is accompanied by the appropriate supporting documentation in the form of bibliographic references, reprints of pertinent publications, copies of reports or letters from authorities, and maps (50 CFR 424.14(b)(2)).

Under the ESA, a listing determination addresses the status of a species, which is defined to also include subspecies and, for any vertebrate species, any distinct population segment (DPS) that interbreeds when mature (16 U.S.C. 1532(16)). Because *P. meandrina* is an invertebrate, it cannot qualify as a DPS. Under the ESA, a species is ''endangered'' if it is in danger of extinction throughout all or a significant portion of its range, or ''threatened'' if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (ESA sections 3(6) and 3(20), respectively, 16 U.S.C. 1532(6) and (20)). The petition requests that the Hawaii portion of the species' range be considered a significant portion of its range, thus the petition focuses primarily on the status of *P. meandrina* in Hawaii. However, the petition also requests that *P. meandrina* be listed throughout its range, and provides some information on its status and threats outside of Hawaii. Our policy on the interpretation of the phrase ''significant portion of its range'' (SPR) under the ESA (79 FR 37577, July 1, 2014) states that, before undergoing an analysis of SPR, we must first find that the species is neither endangered nor threatened throughout all of its range. Therefore, we interpret the petition as a request to consider the status of *P. meandrina* throughout its range first; and if appropriate, subsequently consider whether *P. meandrina* in Hawaii constitutes an SPR and the status of that SPR.

At the 90-day finding stage, we evaluate the petitioners' request based upon the information in the petition including its references and the information readily available in our files. We do not conduct additional research, and we do not solicit information from parties outside the agency to help us in evaluating the petition. We are not required to consider any supporting materials cited by the petitioner if the petitioner does not provide electronic or hard copies, to the extent permitted by U.S. copyright law, or appropriate excerpts or quotations from those materials (*e.g.,* publications, maps, reports, and letters from authorities). We will accept the petitioners' sources and characterizations of the information presented if they appear to be based on accepted scientific principles, unless we have specific information in our files that indicates the petition's information is incorrect, unreliable, obsolete, or otherwise irrelevant to the requested action. Information that is susceptible to more than one interpretation or that is contradicted by other available information will not be dismissed at the 90-day finding stage, so long as it is reliable and a reasonable person would conclude it supports the petitioners' assertions. In other words, conclusive information indicating the species may meet the ESA's requirements for listing is not required to make a positive 90-day finding. We will not conclude that a lack of specific information alone negates a positive 90-day finding if a reasonable person would conclude that the unknown information itself suggests an extinction risk of concern for the species at issue. See 50 CFR 424.14 for regulations on petitions under the ESA.

Our determination as to whether the petition provides substantial scientific or commercial information indicating that the petitioned action may be warranted depends in part on the degree to which the petition includes the following types of information: (1) Information on current population status and trends and estimates of current population sizes and distributions, both in captivity and the wild, if available; (2) identification of the factors under section 4(a)(1) of the ESA that may affect the species and where these factors are acting upon the species; (3) whether and to what extent any or all of the factors alone or in combination identified in section 4(a)(1) of the ESA may cause the species to be an endangered species or threatened species (*i.e.,* the species is currently in danger of extinction or is likely to become so within the foreseeable future), and, if so, how high in magnitude and how imminent the threats to the species and its habitat are; (4) information on adequacy of regulatory protections and effectiveness of conservation activities by States as well as other parties, that have been initiated or that are ongoing, that may protect the species or its habitat; and (5) a complete, balanced representation of the relevant facts, including information that may contradict claims in the petition. See 50 CFR 424.14(d).

The factors under section 4(a)(1) of the ESA that may affect the species are as follows: (1) The present or threatened destruction, modification, or curtailment of habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms to address identified threats; rand (5) any other natural or manmade factors affecting the species' existence (16 U.S.C. 1533(a)(1), 50 CFR 424.11(c)). Information presented on these factors should be specific to the species and should reasonably suggest that one or more of these factors may be operative threats that act or have acted on the species to the point that it may warrant protection under the ESA. Broad statements about generalized threats to the species, or identification of factors that could negatively impact a species, do not constitute substantial information indicating that listing may be warranted. We look for information indicating that not only is the particular species exposed to a factor, but that the species may be responding in a negative fashion; then we assess the potential significance of that negative response.

Taxonomy of the Petitioned *P. meandrina*

As described in the final rule to list 20 species of coral under the ESA (79 FR 53851; September 10, 2014), the morphology-based taxonomy of the genus *Pocillopora,* including *P. meandrina,* has been called into question by several recent genetics papers. A range-wide phylogeographic survey that included most currently recognized pocilloporid species found that reliance on colony morphology is broadly unreliable for species identification, and that several genetic groups have highly limited geographic distributions. The study concluded that ''a taxonomic revision informed foremost by genetic evidence is needed for the entire genus'' (Pinzo 301;n *et al.,* 2013). Similarly, a phylogeographic survey of several currently recognized pocilloporid species representing a range of atypical morphologies thought to be rare or endemic to remote locations throughout the Indo-Pacific found that (1) the current taxonomy of *Pocillopora* based on colony morphology shows little correspondence with genetic groups; (2) colony morphology is far more variable than previously thought; and (3) there are numerous cryptic lineages (*i.e.,* two or more distinct lineages that are classified as one due to morphological similarities). The study concluded that ''the genus *Pocillopora* is in need of taxonomic revision using a combination of genetic, microscopic characters, and reproductive data to accurately delineate species'' (Marti-Puig *et al.,* 2014). Likewise, a more limited study of several currently recognized pocilloporid species in Moorea, French Polynesia found that genetic groups do not correspond to colony morphology, and exhibit a wide range of morphological variation (Forsman *et al.,* 2013).

These studies demonstrate that colony morphology in pocilloporids is a poor indicator of taxonomic relationships for the following reasons: (1) Morphologically similar colonies may not be the same species (*i.e.,* colonies of different species appear similar because of similar environmental conditions or other reasons); and (2) morphologically different colonies may be the same species (*i.e.,* colonies of the same species appear different because of different environmental conditions or other reasons). Because of the taxonomic uncertainty for the genus *Pocillopora,* we concluded in the final listing rule that no final listing decision could be made for the two *Pocillopora* species that had been proposed for listing in 2012 (*P. elegans, P. danae;* 79 FR 53851; September 10, 2014).

Other recent papers on genetic or morphological aspects of *Pocillopora* taxonomy that were in our files when we received the petition (Johnston *et al.,* 2017; Johnston *et al.,* 2018; Pas-Garcia *et al.,* 2015; Schmidt-Roach *et al.,* 2014) indicate that gross morphological plasticity is characteristic of *Pocillopora* species, thus morphological data should be supplemented with genetic data for accurate identification of species (Johnston *et al.,* 2017). A combined genetics and morphology study of several *Pocillopora* species, including *P. meandrina,* did not propose any taxonomic changes to *P. meandrina.* The study found that, in contrast to morphological similarities, *P. verrucosa* and *P. meandrina* are very distinct genetically, and *P. meandrina* is much more closely related to *P.eydouxi* than to *P. verrucosa* genetically (Schmidt-Roach *et al.,* 2014). The morphological plasticity of *Pocillopora* species was shown by a study of *P. damicornis* and *P. inflata* at a site in the southern Gulf of California that coincided with a shift to a higher frequency of storms and lower water turbidity. Over the 44-month period of the study, 23 percent of the *P. damicornis* colonies changed shape to *P. inflata* morphology, providing an *in situ* demonstration of the influence of temporal shifts in environmental conditions on morphologically plastic responses (Pas-Garcia *et al.,* 2015). A genomic study found that *Pocillopora* species are genetically distinct from one another, and that there is a lack of introgressive hybridization between species. Some of these authors went on to develop a genetic technique for identification of Hawaiian *Pocillopora* species, and found that morphology-based identifications often led to *P. ligulata* being mistaken for *P. meandrina* (Johnston *et al.,* 2018).

Despite doubt raised by traditional morphology-based taxonomy, other readily available information in our files presents substantial scientific or commercial information indicating that *P. meandrina* may constitute a valid species for the following reasons: (1) The recent taxonomic revision to some *Pocillopora* species did not propose any changes to *P. meandrina* (Schmidt-Roach *et al.,* 2014); (2) other recent papers have found that *Pocillopora* species, including *P. meandrina,* are genetically distinct from one another (Johnston *et al.,* 2017, 2018), and; (3) the growing genetic information on *P. meandrina* could lead to the description of sub-species rather than new species, but sub-species are treated as species under the ESA. Therefore, *P. meandrina* may be a type of entity that is eligible for listing under the ESA.

Habitat, Range, and Life History

Pocillopora meandrina occurs on shallow reefs and amongst coral communities on rocky reefs at depths of 1 to 27m, and is common in high-energy reef front environments (shallow forereef) throughout its range (Fenner, 2005; Hoeksma *et al.,* 2014; Veron, 2000). In Hawaii and the eastern Pacific, *P. meandrina* is often the dominant species in shallow forereef coral communities (Fenner, 2005; Glynn, 2001). It is found on most coral reefs of the Indo-Pacific and eastern Pacific, with its range encompassing over 180° longitude from the western Indian Ocean to the eastern Pacific Ocean, and approximately 60° latitude from the northern Ryukyu Islands to central western Australia in the western Pacific, and the Gulf of California to Easter Island in the eastern Pacific (Corals of the World website *http://www.coralsoftheworld.org/*).

Pocillopora meandrina has a branching colony morphology, is a broadcast spawner, and has rapid skeletal growth, allowing it to recruit quickly to available substrate and successfully compete for space (Darling *et al,* 2012). High recruitment rates, rapid skeletal growth, and successful competition are well documented for *P. meandrina* in Hawaii (*e.g.,* Brown, 2004; Grigg and Maragos, 1974) and the eastern Pacific (*e.g.,* Jimeénez and Corteés, 2003).

While such competitive reef coral species typically dominate ideal environments, they also have higher susceptibility to threats such as elevated seawater temperatures than reef coral species with generalist, weedy, or stress-tolerant life histories (Darling *et al.,* 2012). For example, *P. meandrina* was among the most affected reef coral species in the 2014 and 2015 mass bleaching events in Hawaii (Kramer *et al.,* 2016; Rodgers *et al.,* 2017). That said, the life history characteristics of *P. meandrina* provide some buffering against threats such as warming-induced bleaching by allowing for rapid recovery from die-offs. For example, in 2016, *P. meandrina* populations in the main Hawaiian Islands were already showing signs of recovery from the 2014 and 2015 bleaching mortality (PIFSC, unpublished data).

The species has several other characteristics that may also provide buffering against some threats, including the capacity for acclimatization and adaptation to changing conditions, the potential for range expansion as previously unsuitable habitat becomes suitable, and a broad range that encompasses extensive habitat heterogeneity. The bleaching and mortality of some colonies of a coral species on a reef, followed by the recovery of hardier colonies, is the process by which acclimatization and adaptation of a species to ocean warming occurs, and has been documented in some *Pocillopora* species (*e.g.,* Rodríguez-Troncoso, *et al.,* 2010; Coles *et al.,* 2018). As conditions change in response to ocean warming, some areas that were previously too cold for reef corals may become suitable, potentially allowing range expansion of certain species into these areas (Yamano *et al.,* 2011; Yara *et al.,* 2011). Finally, habitat conditions are highly heterogeneous across the ranges of broadly-distributed reef corals such as *P. meandrina,* creating a patchwork of conditions that may potentially provide refugia to threats (Fine *et al.,* 2013; McClanahan *et al.,* 2011).

Abundance and Population Trends

Although there is little species-specific, range-wide data on *P. meandrina's* abundance and population trends, there are some data available on the species' abundance and population trends in the main Hawaiian Islands portion of the Hawaiian archipelago, which indicate a significant decrease in coral cover over a recent 14-year period, followed by severe bleaching events. The Hawaii Coral Reef Assessment and Monitoring Program (CRAMP) monitors species-level live coral cover at 60 permanent stations throughout the main Hawaiian Islands. From 1999 to 2012, *P. meandrina* decreased in live coral cover by 36.1 percent for all stations combined (Rodgers *et al.,* 2015). Subsequently, *P. meandrina* was severely impacted in parts of the Hawaiian archipelago due to back-to-back warming-induced bleaching events in 2014 and 2015. Surveys of the impacts of these bleaching events on *P. meandrina* in the northwestern and main Hawaiian Islands show high levels of bleaching and post-bleaching mortality in some locations (Couch *et al.,* 2017; Kramer *et al.,* 2016; Rodgers *et al.,* 2017; see ''Other Natural or Manmade Factors—Ocean Warming'' section below). While there are currently no estimates available of the total abundance or overall population trends for *P. meandrina* in the main Hawaiian Islands, the above information strongly indicates that the species has been in decline in this area, and that the decline was accelerated by the back-to-back mass bleaching events of 2014 and 2015.

It is likely that *P. meandrina* has declined in abundance across most, if not all, of its range, over the past 50 to 100 years, and that the decline has recently accelerated. For most of the world's reef corals, Carpenter *et al.* (2008; Supplementary Information) extrapolated species abundance trend estimates from total live coral cover trends (*i.e.,* all reef coral species combined) and habitat types. For *P. meandrina,* the overall decline in abundance was estimated at 22 percent over the 30-year period up to 2006 (''Percent Population Reduction''), and 10 percent over the 30 year period up to the 1998 bleaching event (''Back-cast Percent Population Reduction''). However, total live coral cover trends are highly variable both spatially and temporally, thus data from the same location and time period can be interpreted differently (Bellwood *et al.,* 2004; Sweatman *et al.,* 2011), and species trends do not necessarily correlate with overall live coral cover trends. Thus, quantitative inferences of species-specific trends from total live coral cover trends should be interpreted with caution. At the same time, an extensive body of literature documents global declines in live coral cover, accompanied by shifts to coral reef communities dominated by hardier coral species or algae over the past 50 to 100 years (*e.g.,* Birkeland, 2004; Brainard *et al.,* 2011; Pandolfi *et al.,* 2003; Sale and Szmant, 2012; Veron *et al.,* 2009). Recently, these changes have accelerated in response to an unprecedented series of mass bleaching events across the majority of the world's coral reefs (Hoegh-Guldberg *et al.,* 2017; Hughes 2018a, 2018b; Lough *et al.,* 2018), 90 percent of which are in the Indo-Pacific. Given that *P. meandrina* occurs in many areas affected by these broad changes, and it is susceptible to both global and local threats, the species likely declined in abundance over the past 50 to 100 years across most, if not all, of its range, and that the decline has recently accelerated; but, a precise quantification is not possible based on the limited species-specific information.

Analysis of ESA Section 4(a)(1) Factors

Although the petition presents information on at least four of the five ESA factors in section 4(a)(1) of the ESA (*e.g.,* present modification of its habitat; disease and predation; inadequacy of regulatory mechanisms; and other natural or manmade factors), the information presented in the petition, together with other readily available information in our files, regarding ocean warming (Factor E) is substantial enough to make a determination that a reasonable person conducting an impartial scientific review could conclude that this species may warrant listing as endangered or threatened based on this factor alone. As such, we focus our discussion below on ocean warming and subsequent warming-induced coral bleaching and mortality, and present our evaluation of the information regarding this factor alone and its impact on the extinction risk of the species. However, we note that in the status review for this species, we will evaluate all ESA section 4(a)(1) factors to determine whether any one or a combination of these factors are causing declines in the species or likely to substantially negatively affect the species such that that *P. meandrina* is either presently at risk of extinction or likely to become so in the foreseeable future.

Other Natural or Manmade Factors—Ocean Warming

Information presented in the petition and other readily available information in our files indicate that the most important threat to *P. meandrina* across its range currently and in the future, and to the Indo-Pacific reef coral communities of which *P. meandrina* is a part, is ocean warming and subsequent warming-induced coral bleaching and mortality. Based on this information, we provide summaries of the (1) observed ocean warming to date; (2) projected ocean warming; (3) observed effects of warming-induced mass bleaching on Indo-Pacific reef coral communities and *P. meandrina* to date; and (4) projected effects of warming-induced mass bleaching on Indo-Pacific reef coral communities and *P. meandrina.*

(1) *Observed Ocean Warming.* As described in the 2014 final rule listing 20 reef coral species as threatened (79 FR 53851; September 10, 2014), we considered the International Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5) ''Climate Change 2013: The Physical Science Basis'' (IPCC, 2013) to be the best available information on the physical basis of ocean warming as well as future

projections. Thus the following section is based largely on IPCC (2013), supplemented by more recent information. Since the Industrial Revolution in the mid-19th century, the magnitude and pace of greenhouse gases emissions (GHGs; *e.g.,* carbon dioxide (CO_2) and methane) have rapidly increased, resulting in steadily higher atmospheric GHG concentrations, the most influential of which is CO_2. The IPCC found that these changes have resulted in warming of the global climate system since the 1950s due to trapping of the sun's heat in the atmosphere by the GHGs (*i.e.,* the greenhouse effect). With regard to global ocean warming that has already occurred, the IPCC determined that the upper ocean (0 − 700 m) warmed from 1971 to 2010, including warming of the upper 75 m by 0.11°C per decade. Warming varied regionally among the oceans, but all oceans warmed between 1971 and 2010, including the tropical and sub-tropical Indo-Pacific (IPCC, 2013).

IPCC (2013) was based on data collected through 2010, but overall global warming (oceans and land combined) and ocean warming have both continued at an even greater pace since then. Global temperatures (ocean and land combined) in 2015 and 2016 were the warmest since instrumental record keeping began in the 19th century (NASA, 2016). Ocean warming has continued, and there was more ocean warming in 2014–2016 than any previous three-year period on record (Jewett and Romanou, 2017). There is consensus among several different methods of monitoring seawater temperatures that ocean warming has continued unabated since 2010 both globally and regionally in all of the world's oceans (Gleckler *et al.,* 2016; Cheng *et al.,* 2017; Wang *et al.,* 2018). Between 1998 and 2015, the greatest warming was recorded in the Southern Ocean, the tropical/subtropical Pacific Ocean, and the tropical/subtropical Atlantic Ocean (Cheng, *et al.,* 2017).

(2) *Projected Ocean Warming.* IPCC's AR5 uses projected changes in the global climate system to model potential patterns of future climate based on a set of four Representative Concentration Pathways (RCPs) that provide a standard framework for consistently modeling future climate change. The RCP system is based on levels of positive ''radiative forcing,'' defined as the net energy gain relative to the 1986–2005 average by the year 2100 in terms of watts per square meter (W/m^2); thus, higher values equate to greater warming over the time period. The four pathways are named RCP2.6, RCP4.5, RCP6.0, and RCP8.5 (*e.g.,* RCP2.6 = 2.6 W/m^2 in 2100). The four pathways have atmospheric CO_2 equivalents of 421 (RCP2.6), 538 (RCP4.5), 670 (RCP6.0), and 936 ppm (RCP 8.5) in 2100, and follow very different trajectories to reach those endpoints. Mean global warming estimates by 2100 for the pathways are 1.0°C (RCP2.6), 1.8°C (RCP4.5), 2.2°C (RCP6.0), and 3.7°C (RCP8.5). The four new pathways were developed with the intent of providing a wide range of total climate forcing to guide policy discussions and specifically include one mitigation pathway leading to a very low forcing level (RCP2.6), two stabilization pathways (RCP4.5 and RCP6), and one pathway with continued high GHG emissions (RCP8.5; IPCC, 2013).

The climate change projections, including for ocean warming, ocean acidification, and sea level rise, in the 2014 coral final listing rule were based on RCP8.5 in IPCC's AR5 (IPCC, 2013). RCP8.5 assumes a continued *status quo* increase in global GHG emissions over the 21st century. The NMFS 2014 rule for 20 reef-building corals used RCP8.5 as its basis. Indeed, global energy-related CO_2 emissions grew by approximately 10 percent, with seven of those 10 years setting new historic highs (IEA, 2018); and global atmospheric CO_2 concentration grew from 385 to 407 parts per million, with each year setting new historic highs, according to NOAA's Earth System Research Laboratory station on Mauna Kea, Hawaii (*https://www.esrl.noaa.gov/gmd/ccgg/trends/*). Thus, the best available current information continues to support the NMFS policy that RCP8.5 is the most likely pathway in the future.

RCP8.5 projects that global annual mean ocean surface temperatures will increase from 2013 levels by approximately 0.4–1.0°C by 2030, approximately 0.7–2.0°C by 2060, and approximately 2.0–5.0°C by 2100, further exacerbating the impacts of ocean warming on corals and coral reefs. In the Indo-Pacific, projected changes in annual median ocean surface temperatures under RCP8.5 will increase from 2013 levels by approximately 0.0–1.0°C by 2035, 1.0–3.0°C by 2065, and 2.0–5.0°C by 2100. Spatial variability in the projections consists mostly of larger increases in the Red Sea, Persian Gulf, and the Coral Triangle, and lower increases in the central and eastern Indian Ocean and south-central Pacific. The percent ranges in the projections described above are for the 25 to 75 percent range confidence intervals, however the range of projections within the 5 to 95 percent range confidence intervals are considerably greater (IPCC, 2013). As described in detail in the RCP8.5 Projections section of the 2014 coral final listing rule, these global mean projections are not necessarily representative of ocean surface temperature conditions throughout the ranges and habitats of reef corals in the future, due both to spatial variability and to statistical range of the RCP8.5 ocean warming projections (79 FR 53851; September 10, 2014).

(3) *Observed Effects of Warming-induced Mass Coral Bleaching.* The frequency, intensity, and magnitude of mass coral bleaching events has rapidly increased since the early 1980s, suggesting that tropical coral reef systems are transitioning to a new era in which the interval between recurrent bouts of coral bleaching is too short for a full recovery of mature assemblages (Hughes *et al.,* 2018b).

Warming-induced coral bleaching occurs when elevated seawater temperatures cause the expulsion of the host coral's symbiotic zooxanthellae in response to thermal stress. While mild to moderate bleaching does not necessary cause coral mortality, repeated or prolonged bleaching can lead to colony mortality. Many coral physiological processes are optimized to the local long-term seasonal and interannual variations in seawater temperature experienced by the corals, and an increase of only 1°C–2°C above the normal local seasonal maximum can induce bleaching. Bleaching is best predicted by using an index of accumulated thermal stress above a locally established threshold (Brainard *et al.,* 2011). Most coral species are susceptible to bleaching, but this susceptibility varies among taxa. In addition, many coral species exhibit various levels of adaptation or acclimatization to elevated seawater temperatures. While coral bleaching patterns are complex, there is general agreement that thermal stress has led to accelerated bleaching and mass mortality during the past several decades. During the years 1983, 1987, 1995, 1996, 1998, 2002, 2004, 2005, 2014, 2015, and 2016, widespread warming-induced coral bleaching and mortality was documented in many reef coral communities that *P. meandrina* is part of in the Indo-Pacific and the eastern Pacific (Jokiel and Brown, 2004; Kenyon and Brainard, 2006; Brainard *et al.,* 2011; Rodgers *et al.,* 2017; Hughes *et al.,* 2017a, 2018a). The bleachings of 2014–2016 were the longest, most widespread, and likely the most damaging coral bleaching events on record. They affected more coral reefs than any previous global bleaching event, and were worse in some locales than ever recorded before (*e.g.,* Great Barrier Reef/GBR, Kiribati, Jarvis Island). Heat stress during this event also caused mass bleaching in several reefs where bleaching had never been recorded before (*e.g.,* northernmost GBR; Eakin, 2017).

According to the information in the petition and other readily available information in our files, warming-induced bleaching and mortality have impacted *P. meandrina,* including in the Hawaiian archipelago and the GBR. In Hawaii, *P. meandrina* is one of the most common coral species and often dominates the forereef coral community. The consecutive bleaching events of 2014 and 2015 in the Hawaiian archipelago were unprecedented in scale, intensity, and magnitude, and *P. meandrina* was one of the most severely affected reef coral species (Couch *et al.,* 2017; Rodgers *et al.,* 2017). Surveys in late 2014 at multiple sites on four islands in the northwestern Hawaiian Islands showed 15.5 percent of *P. meandrina* colonies had been bleached (colonies that lost >50% of pigmentation). Surveys were repeated in 2015 for post-bleaching mortality of coral species making up >1 percent of live coral at the 2014 survey sites. Only one site had >1 percent of *P. meandrina* in 2014, and that site had no *P. meandrina* in 2015 (Couch *et al.,* 2017). Surveys of eight sites in Hanauma Bay on Oahu in 2015 and 2016 found that 64 percent of *P. meandrina* colonies showed ''signs of bleaching'', and that 1.3 percent of the *P. meandrina* colonies suffered total post-bleaching mortality (Rodgers *et al.,* 2017). Surveys at eight permanent monitoring sites on the west coast of the Big Island of Hawaii in 2015 showed a mean loss in live coral cover (all species combined) of 49.6 percent. Surveys of the seven sites where *P. meandrina* had been abundant before the bleaching events showed that 77.6 percent of the *P. meandrina* colonies suffered total post-bleaching mortality (Kramer *et al.,* 2016).

The 2016 warming-induced bleaching event across the Indo-Pacific was the worst in recorded history in terms of severity and duration of elevated seawater temperatures and ensuing mass coral bleaching and mortality (Lough *et al.,* 2018). Much of the GBR was affected by the elevated seawater temperatures, resulting in bleaching levels of 75–100 percent on many of the GBR's northern reefs, and a mean reduction in live coral cover of 30 percent across the entire 2,300 km GBR between March and November 2016. In March and April 2016, a survey was conducted on 83 reefs spanning the central and northern GBR to determine the responses of 31 reef coral taxonomic groups to the bleaching event, including ''other *Pocillopora*'' (*P. meandrina* and *P. verrucosa*). This group was the third-most bleached of the 31 groups. A sub-sample of 43 of the most affected reefs was re-surveyed in November 2016 to determine the extent of post-bleaching mortality and subsequent loss of live coral cover, which showed that the ''other *Pocillopora*'' group had approximately 55 percent loss of live coral cover (Hughes *et al.,* 2017a, 2018a).

Although difficulty in identification of *Pocillopora* species and lack of species-level field surveys means little of the available information on the impacts of warming-induced bleaching on *Pocillopora* species is specifically for *P. meandrina,* the family Pociloporidae and the genus *Pocillopora* are highly susceptible to warming-induced bleaching relative to other reef corals. A survey of the susceptibilities of 40 reef coral taxa to the 1998 warming-induced mass bleaching event on the GBR found that three Pociloporidae species (*P. damicornis, Stylophora pistillata, Seriatopora hysrix*) were among the seven most susceptible taxa (Marshal and Baird, 2000). Similarly, a survey of the sensitivities of 39 reef coral genera to the 1998 bleaching event in the Indian Ocean found *Pocillopora* to be eighth-most susceptible of the 39 genera (McClanahan *et al.,* 2007). In a study carried out from 1997 to 2010 on the responses of a diverse reef coral assemblage in Japan to bleaching events in 1998 and 2001, *Pocillopora* species fared the worst of all genera, nearly dying out in 1998 and not recovering by 2010 (van Woesik, *et al.,* 2011). A meta-analysis of studies conducted between 1987 and 2012 at five locations in the Indo-Pacific (Moorea, GBR, Kenya, Hawaii, and Taiwan) found that the absolute and relative cover of many coral genera including *Pocillopora* declined in abundance, while some genera showed no change in abundance, and a few genera increased in abundance (Edmunds *et al.,* 2014).

(4) *Projected Effects of Warming-induced Mass Coral Bleaching.* Projections of ocean warming and subsequent mass coral bleaching suggest these events will increase in frequency, intensity, and magnitude across the Indo-Pacific, including the great majority of *P. meandrina's* range. Hoeke *et al.* (2011) projected future changes to coral growth and mortality in the Hawaiian archipelago based the A1B scenario from the IPCC's Fourth Assessment Report (IPCC, 2007). This scenario assumes GHGs will peak in the mid-21st century then modestly decline as renewable energy becomes more common, and is most similar to RCP6.0 (IPCC, 2013). Despite the drop of GHGs in the late 21st century in the A1B scenario, this analysis projected precipitous declines in live coral cover (all reef corals combined, including *P. meandrina*) in the northwestern Hawaiian Islands between 2030 and 2050, and steady declines over the 21st century in the main Hawaiian Islands (Hoeke *et al.,* 2011). These results illustrate the concept of ''commitment'', *i.e.,* the world's oceans are currently committed to some future warming from the CO_2 build-up already in the atmosphere, even if anthropogenic emissions went to zero now (IPCC, 2013). As explained above, for the purpose of this finding, we will assume that RCP8.5 in IPCC's Fifth Assessment Report (IPCC, 2013) is the most likely pathway, but Hoeke *et al.* (2011) base their analysis on the more optimistic A1B scenario (similar to RCP6.0). Thus, we project that conditions in the Hawaiian Islands in the future will be worse than projected by Hoeke *et al.* (2011).

Projections of the responses of the world's corals and coral reefs ecosystems to ocean warming have been addressed recently by several papers that project coral responses to one or more of the IPCC's four pathways in the future. An analysis of the likely reef coral disease outbreaks resulting from ocean warming projected by RCP4.5 and RCP8.5 concluded that both pathways are likely to cause sharply increased, but spatially highly variable, levels of coral disease in the future, and that the outbreaks would be more widespread, frequent, and severe under RCP8.5 than RCP4.5 (Maynard *et al,* 2015). An analysis of the timing and extent of Annual Severe Bleaching (ASB) of the world's coral reefs under RCP4.5 vs RCP8.5 found that the global average timing of ASB would be only 11 years later under RCP4.5 than RCP8.5, and that >75 percent of all reefs still would experience ASB before 2070 under RCP4.5 (van Hooidonk *et al,* 2016). An analysis of the responses of coral reefs to increased warming and acidification under all four pathways found that only RCP2.6 would allow the current downward trend in coral reefs to stabilize, and that RCP4.5 would likely drive the elimination of most coral reefs by 2040–2050 (Hoegh-Guldberg *et al.,* 2017). Hughes *et al.,* (2017b) analyzed the responses of coral reefs to RCP2.6 and to the implementation of the 2015 Paris Agreement (which would result in a scenario roughly equivalent to RCP4.5) and found that RCP2.6 would result in approximately the same amount of additional warming and bleaching by 2100 that has occurred over the last century, and that implementation of the Paris Agreement (*i.e.,* RCP4.5) would lead to severe consequences for coral reefs (Hughes *et al.,* 2017b), despite the fact that RCP6.0 and RCP8.5 would be even worse. Another analysis regarding responses of coral reefs if global warming is limited to 1.5°C, 2.0°C, or 3°C (roughly equivalent to RCP4.5, RCP6.0, and RCP8.5) found that estimated levels of thermal stress would be approximately seven, 11, and 23 times, respectively, the level of thermal stress that these reefs have already experienced since 1878, and approximately two, three, and six times the level of thermal stress experienced in 2016 (Lough *et al.,* 2018).

All five analyses considered the impacts of one or both of the IPCC's lower emissions pathways (RCP2.6 and RCP4.5), and each analysis reached the same conclusion: Even these lower emissions pathways are likely to have more severe impacts to reef corals in the future than have been observed in recent years (Hoegh-Guldberg *et al.,* 2017; Hughes *et al.,* 2017b; Lough *et al.,* 2018; Maynard *et al,* 2015; van Hooidonk *et al,* 2016), partially because the GHG emissions that have already occurred have irreversibly locked in a certain amount of warming due to ''commitment,'' as described above. Indo-Pacific reef corals would likely be even more severely impacted by warming-induced bleaching events resulting from ocean warming under the other two pathways in the future, especially RCP8.5, as shown by two analyses (Hoegh-Guldberg *et al.,* 2017b; van Hooidonk *et al,* 2016). Although *P. meandrina* has several life history characteristics that may buffer some of the effects of ocean warming (refer back to the Habitat, Range, and Life History section of this finding), based on the effects of warming-induced bleaching to date on *P. meandrina* and its relatively high susceptibility to warming, the information in the petition and other readily available information in our files suggests this species may be severely affected across its range in the future by ocean warming projected under RCP8.5.

Ocean Warming Summary. From the above analysis of ocean warming and its effects on *P. meandrina* and the coral reef community of which *P. meandrina* is a part, we find four key points to be relevant: (1) Substantial ocean warming, including in the tropical/subtropical Indo-Pacific, has already occurred and continues to occur; (2) ocean warming, including in the tropical/subtropical Indo-Pacific, is projected to continue at an accelerated rate in the future; (3) substantial warming-induced mass bleaching of Indo-Pacific reef coral communities, including *P. meandrina,* has already occurred and continues to occur; and (4) warming-induced mass bleaching of Indo-Pacific reef coral communities, including *P. meandrina,* is projected to steadily increase in frequency, intensity, and magnitude in the future. In short, ocean warming is expected to continue to affect *P. meandrina* throughout its range in the future.

Petition Finding

After reviewing the information presented in the petition and other readily available information in our files, we find that listing *P. meandrina* across its range may be warranted based on the threat of ocean warming alone. Therefore, in accordance with section 4(b)(3)(B) of the ESA and NMFS' implementing regulations (50 CFR 424.14), we will commence a status review of this species. During the status review, we will determine whether *P. meandrina* is in danger of extinction (endangered) or likely to become so (threatened) throughout all or a significant portion of its range. If listing is warranted, we will publish a proposed rule and solicit public comments before developing and publishing a final rule. If we determine that the species is in danger of extinction or likely to become so in the foreseeable future throughout all of its range, we will list the species as endangered or threatened, and it will be unnecessary to determine if Hawaii constitutes a significant portion of the species' range. If *P. meandrina* is not proposed for listing as endangered or threatened throughout all of its range, we will then determine if Hawaii constitutes a significant portion of the species' range. If so, we will determine the status of *P. meandrina* in Hawaii, and proceed accordingly (79 FR 37578; July 1, 2014).

Information Solicited

To ensure that the status review is based on the best available scientific and commercial data, we are soliciting information on whether *P. meandrina* is endangered or threatened. Specifically, we are soliciting information in the following areas:

(1) Historical and current distribution and abundance of *P. meandrina* throughout its range;

(2) Historical and current condition of *P. meandrina* and its habitat;

(3) Population density and trends of *P. meandrina;*

(4) The effects of climate change, including ocean warming and acidification, on the distribution and condition of *P. meandrina* and other organisms in coral reef ecosystems over the short- and long-term;

(5) The effects of other threats including dredging; coastal development; land-based sources of pollution, including coastal point source pollution, and agricultural and land use practices; disease, predation, the trophic effects of fishing, the aquarium trade, physical damage from boats and anchors, marine debris, aquatic invasive species on the distribution and abundance of *P. meandrina* over the short- and long-term; and the inadequacy of regulatory mechanisms; and

(6) Management programs for conservation of *P. meandrina,* including mitigation measures related to any of the threats listed under (5) above.

We request that all information be accompanied by (1) supporting documentation such as maps, bibliographic references, or reprints of pertinent publications; and (2) the submitter's name, address, and any association, institution, or business that the person represents.

References Cited

A complete list of references upon request from Lance Smith, NOAA IRC, NMFS/PIRO/PRD, 1845 Wasp Blvd., Bldg. 176, Honolulu, HI 96818.

Authority

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

Dated: September 17, 2018.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

[Docket No. 180212159–8159–01]

RIN 0648–BH75

Atlantic Highly Migratory Species; Shortfin Mako Shark Management Measures; Proposed Amendment 11; Comment Period Extension

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and