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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 223 and 226

[Docket No: 200918–0249]

RIN 0648–BJ52

Endangered and Threatened Species; Critical Habitat for the Threatened Indo-Pacific Corals

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

ACTION: Proposed rule; request for comments.

SUMMARY: We, the National Marine Fisheries Service (NMFS), propose to designate critical habitat for the seven threatened corals in U.S. waters in the Indo-Pacific (*Acropora globiceps, Acropora jacquelineae, Acropora retusa, Acropora speciosa, Euphyllia paradivisa, Isopora crateriformis,* and *Seriatopora aculeata*) pursuant to section 4 of the Endangered Species Act (ESA). Seventeen specific occupied areas containing physical features essential to the conservation of these coral species are being proposed for designation as critical habitat; these areas contain approximately 600 square kilometers (km^2; 230 square miles) of marine habitat. We have considered positive and negative economic, national security, and other relevant impacts of the proposed designations, and we propose to exclude two areas from the critical habitat designations due to anticipated impacts on national security. We are soliciting comments from the public on all aspects of the proposal, including our identification of the geographical area and depths occupied by the species, the physical and biological feature essential to the coral species' conservation and identification, areas not included and excluded, and consideration of impacts of the proposed action.

DATES: Comments on this proposal must be received by January 26, 2021.

Public hearings: If requested, we will hold at least one public hearing on this proposed rule.

ADDRESSES: You may submit comments, identified by the docket number NOAA–NMFS–2016–0131, by any 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-2016-0131* click the ''Comment Now'' icon, complete the required fields, and enter or attach your comments.
- *Mail:* Lance Smith, Protected Resources Division, NMFS, Pacific Islands Regional Office, NOAA Inouye Regional Center, 1845 Wasp Blvd., Bldg. 176, Honolulu, HI 96818.

Instructions: You must submit comments by one of the previously described methods to ensure that we receive, document, and consider them. 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. All comments received are a part of the public record and will generally be posted to *http://www.regulations.gov* without change. All Personal Identifying Information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

FOR FURTHER INFORMATION CONTACT: Lance Smith, NMFS, Pacific Islands Regional Office, 808–725–5131, *lance.smith@noaa.gov;* or, Celeste Stout, NMFS, Office of Protected Resources, 301–427–8436, *celeste.stout@noaa.gov.*

SUPPLEMENTARY INFORMATION: In accordance with section 4(b) of the ESA (16 U.S.C. 1533) and our implementing regulations (50 CFR 424.12), this proposed rule is based on the best scientific information available concerning the range, biology, habitat, threats to the habitat, and conservation objectives for the seven threatened corals in U.S. waters of the Indo-Pacific (*Acropora globiceps, A. jacquelineae, A. retusa, A. speciosa, Euphyllia paradivisa, Isopora crateriformis,* and *Seriatopora aculeata*). We reviewed the available information and have used it to identify physical and biological features essential to the conservation of each coral, the specific areas within the occupied areas that contain the essential physical and biological features that may require special management considerations or protections, the Federal activities that may impact the physical or biological features or areas, and the potential impacts of designating critical habitat for these seven Indo-Pacific corals. The economic, national security, and other relevant impacts of the proposed critical habitat designations for these coral species are described in the draft document titled, ''Endangered Species Act Critical Habitat Information Report: Basis and Impact Considerations of Critical Habitat Designations for Threatened Indo-Pacific Corals,'' hereafter referred to as the Draft Information Report (NMFS, 2019). This supporting document is available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**).

Background

We listed 20 coral species as threatened under the ESA on September 10, 2014 (79 FR 53851). Although 15 of the listed species occur in the Indo-Pacific, only 7 of the listed coral species have been found in U.S. waters: *A. globiceps, A. jacquelineae, A. retusa, A. speciosa, E. paradivisa, I. crateriformis,* and *S. aculeata.* These seven species have been found in the U.S. jurisdictions of American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and the Pacific Remote Island Area (PRIA). The final listing determinations were based on the best available information on a suite of demographic, spatial, and susceptibility components that influence the species' vulnerability to extinction in the face of continuing threats over the foreseeable future. All 20 listed species have undergone some level of population decline and are susceptible to multiple threats, including: Ocean warming, diseases, ocean acidification, ecological effects of fishing, and land-based sources of pollution. We found that aspects of the species' demography and distribution buffer the effects of these threats. Although we have no information that indicates that these species are currently in danger of extinction, we determined that they all are likely to become endangered throughout all of their ranges within the foreseeable future as a result of a combination of threats, the most severe of which are related to climate change. As such, we listed them as threatened. The following proposed rule is based on our Draft Information Report and peer review comments on the report. All of the information that we used to make our determinations in this proposed rule is contained in that report. The Draft Information Report is available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**).

Natural History

This section summarizes life history and biological characteristics of Indo-

Pacific reef-building corals to provide context for the identification of the physical and biological feature essential for the conservation of these species. In this section, we cover several topic areas including an introduction to reef-building corals, as well as reproduction, settlement and growth, coral habitat types, and coral reef ecosystems. There is little species-specific information available on the life history, reproductive biology, and ecology for the seven corals that occur in U.S. waters of the Indo-Pacific, because many of the several hundred Indo-Pacific reef-building corals resemble one another, thus most investigations to date have been at the genus level. We provide specific information for each species where possible. In addition, we provide general information on the biology and ecology of the Indo-Pacific corals, highlighting traits that these seven corals share. The information below is largely summarized from the final listing rule (79 FR 53851; September 10, 2014), and it has been updated with the best available scientific information to date. The seven ESA-listed Indo-Pacific corals are reef-building corals. Reef-building corals, in the phylum Cnidaria, are marine invertebrates that occur as polyps. The Cnidaria include true stony corals (class Anthozoa, order Scleractinia), the blue coral (class Anthozoa, order Helioporacea), and fire corals (class Hydrozoa, order Milleporina). These species secrete massive calcium carbonate skeletons that form the physical structure of coral reefs. Reef-building coral species collectively produce coral reefs over time in high-growth conditions, but they also occur in non-reef habitats. That is, they are reef-building, but not reef-dependent. About 90 percent of the world's approximately 800 reef-building coral species occur in the Indo-Pacific (Veron, 2000). These unique animals contain symbiotic algae within their cells, they produce clones of themselves by different means, and most of them occur as colonies of polyps. Polyps are the building blocks of colonies, and colony growth occurs both by increasing the number of polyps, as well as extending the supporting skeleton under each polyp.

Reef-building corals are able to grow and thrive in the characteristically nutrient-poor environments of tropical and subtropical regions due to their ability to form mutually beneficial symbioses with unicellular photosynthetic algae (zooxanthellae) living within the host coral's tissues. Zooxanthellae belong to the dinoflagellate genus *Symbiodinium* and provide nutrition to the host coral by translocating fixed organic carbon and other nutrients. In return, they receive inorganic waste metabolites from host respiration as well as protection from grazing. This exchange of nutrients allows both partners to flourish and helps the coral secrete the calcium carbonate that forms the skeletal structure of the coral colony, which in turn contributes to the formation of the reef. Thus, reef-building corals are also known as zooxanthellate corals. Some corals do not contain zooxanthellae, and these species form much smaller skeletons, and therefore are not considered reef-building. The seven ESA-listed Indo-Pacific corals discussed in this proposed rule are zooxanthellate species, and thus are reef-building, because they contain symbiotic algae in their cells, enabling them to grow large skeletons that contribute to the physical structure of coral reefs.

Coral polyps can occur as free-living, solitary polyps (*e.g.,* fungiids) or as colonies of polyps, depending on the species. Most reef-building coral species are colonial, producing colonies made up of dozens to thousands of polyps that are connected seamlessly through tissue and skeleton. In a colonial species, a single larva will develop into a discrete unit (the primary polyp) that then produces modular units of itself (*i.e.,* genetically-identical copies, or clones, of the primary polyp, otherwise known as clones). Each polyp consists of a column with mouth and tentacles on the upper side growing on top of a calcium carbonate skeleton, which the polyps produce through the process of calcification. Colony growth is achieved mainly through the addition of more cloned polyps. The colony can continue to exist even if numerous polyps die, or if the colony is broken apart or otherwise damaged. The seven listed Indo-Pacific corals are all colonial species, although polyp size, colony size, and colony morphology vary considerably by species and also based on environmental variables in different habitats. Colonies themselves can produce clones, most commonly through fragmentation or budding (described in more detail below). Clones can also be produced in some species by asexual larvae or polyp bail-out (a rare case when an individual polyp breaks away from the colony due to poor environmental conditions and re-settles elsewhere). The seven listed Indo-Pacific corals are all clonal species, both as colonies of cloned polyps, and with the ability to produce clones of individual colonies. The way they produce colony-level clones varies by species. For example, branching species are much more likely than encrusting species to produce clones via fragmentation; Brainard *et al.,* 2011).

Corals use a number of diverse reproductive strategies that have been researched extensively; however, many individual species' reproductive modes remain poorly described. Most coral species use both sexual and asexual propagation. Sexual reproduction in corals is primarily through gametogenesis (*i.e.,* development of eggs and sperm within the polyps). Some coral species have separate sexes (gonochoric), while others are hermaphroditic. Strategies for fertilization are either by brooding (internal fertilization) or broadcast spawning (external fertilization). Asexual reproduction in coral species most commonly involves fragmentation, by which colony pieces or fragments are dislodged from larger colonies and establish new colonies, although the budding of new polyps within a colony can also be considered asexual reproduction. In many species of branching corals, fragmentation is a common and sometimes dominant means of propagation (79 FR 53852, September 10, 2014).

Of the seven listed Indo-Pacific species, *A. retusa, A. globiceps,* and *A. jacquelineae* are all hermaphroditic spawners. The reproductive characteristics of *A. speciosa* have not yet been determined, but most other *Acropora* species are also hermaphroditic spawners. *Euphyllia paradivisa's* reproductive mode is unknown and other *Euphyllia* species exhibit a variety of reproductive characteristics, so it is unclear which is most probable for the species. The reproductive characteristics of *I. crateriformis* and *S. aculeata* have also not been determined, but other similar species of both *Isopora* and *Seriatopora* are simultaneous hermaphroditic brooders. As for skeletal growth, there is no species-specific information available, but branching *Acropora* species such as the four listed *Acropora* species are typically relatively fast-growing (Brainard *et al.,* 2011).

Coral larvae presumably experience considerable mortality from predation or other factors prior to settlement and metamorphosis. Such mortality cannot be directly observed, but is inferred from the large number of eggs and sperm spawned versus the much smaller number of recruits observed later. Little is known concerning the settlement patterns of planulae (free-swimming larvae) of the listed Indo-Pacific corals. In general, upon proper stimulation, coral larvae, whether released from parental colonies or developed in the water column external to the parental colonies (like *Acropora* spp.), settle and metamorphose on appropriate substrates. Biological and physical factors that have been shown to affect spatial and temporal patterns of coral recruitment include substrate availability and community structure, grazing pressure, fecundity, mode and timing of reproduction, behavior of larvae, hurricane disturbance, physical oceanography, the structure of established coral assemblages, and chemical cues. Like most corals, the listed Indo-Pacific corals require hard, consolidated substrate, including attached, dead coral skeleton, for their larvae to settle. Algal growth limits the amount of hard substrate available to coral settlement, and a low nutrient environment is less conducive to algal growth. Once larvae are able to settle onto appropriate hard substrate, metabolic energy is diverted to colony growth and maintenance.

Reef-building corals combine calcium and carbonate ions derived from seawater into crystals that form their skeletons. Skeletal expansion rates vary greatly by taxa, morphology, location, habitat and other factors. For example, in general, branching species (*e.g.,* most *Acropora* species) have much higher skeletal extension rates than massive species (*e.g.,* massive *Porites* species). The energy required to produce new polyps and build calcium carbonate skeleton is provided by the symbiotic relationship corals have with photosynthetic zooxanthellae. The zooxanthellae require light to photosynthesize, thus lower water clarity (*i.e.,* poor transparency) reduces the host coral's energy, growth and survival by limiting the amount of light that penetrates the water. Lower water clarity sharply reduces photosynthesis in zooxanthellae with moderate reductions in adult colony survival and calcification. The skeletons of coral colonies are bound together by cementation, resulting in the formation of coral reefs. Species with high recruitment rates or fast growth rates may have the ability to recover more quickly from disturbances. Additionally, long-lived species with large colony size can sustain partial mortality (fission) and still have the potential for persistence and regrowth (79 FR 53852, September 10, 2014). Additional information on the biological requirements for reproduction, settlement, and growth is provided below in the *Physical and Biological Features Essential for Conservation* section.

Shallow coral reefs are fragile ecosystems that exist in a narrow band of environmental conditions that allow the skeletons of reef-building coral species to grow quickly enough for reef accretion to outpace reef erosion. High-growth conditions for reef-building corals include clear, warm waters with abundant light, and low levels of nutrients, sediments, and freshwater. The three broad categories of coral reefs are fringing reefs, barrier reefs, and atolls. Fringing reefs are mostly close to coastlines, and usually have a high component of non-carbonate sediment. Barrier reefs are offshore and are composed of wave-resistant consolidated limestone. Atolls are usually a wall of reefs partially or completely enclosing a central lagoon. There are not sharp differences that clearly mark boundaries between reef types. For example, fringing reefs gradually become barrier reefs with increasing distance from shore. Also, the shape of both barrier reefs and atolls is largely determined by the bathymetry of the substratum, producing many irregularly shaped reefs that are intermediary between the two types. Isolated reefs that do not fit any of these descriptions are referred to as platform reefs. Despite the differences between the reef categories, most fringing reefs, barrier reefs, atolls, and platform reefs consist of a reef slope, a reef crest, and a back-reef, which in turn are typically characterized by distinctive habitats. The characteristics of coral reef habitat vary greatly by reef categories, locations, latitudes, frequency of disturbance, etc., and there is also much variability within each habitat type. Temporal variability in coral habitat conditions is also very high, both cyclically (*e.g.,* from tidal, seasonal, annual, and decadal cycles) and episodically (*e.g.,* storms, temperature anomalies, etc.). Together, all these factors contribute to the habitat heterogeneity of coral reefs across the Indo-Pacific, as described in more detail in the final listing rule (79 FR 53852; September 10, 2014).

As described previously, reef-building corals are not dependent on coral reefs, and many of these species can thrive in low-growth conditions where skeletal growth is inadequate to result in accretion of coral reefs. ''Non-reef habitat'' refers to hard substrates where reef-building corals can grow, including marginal habitats where conditions prevent reef development (*e.g.,* turbid or high-latitude or upwelling-influenced areas) and recently available habitat (*e.g.,* lava flows). All the listed species can occur in both shallow coral reef and non-reef habitats, provided that hard substrate and suitable water quality are present. The term ''mesophotic habitat'' refers to hard substrates deeper than 30 m. Shallow coral reefs, non-reef habitats, and mesophotic habitats are not necessarily sharply delineated from one another, thus one may gradually blend into another. The total area of non-reef and mesophotic habitats is likely greater than the total area of shallow coral reef habitats within the ranges of the listed corals (79 FR 53852; September 10, 2014). Despite the large amount of variability in habitats occupied by corals, they have several characteristics in common that provide the fundamental support necessary for coral settlement and growth, including hard substrate and low-nutrient, clear water with good light penetration.

The seven listed Indo-Pacific species within U.S. waters vary in their recorded depth ranges and habitat types. *Acropora globiceps* occurs on upper reef slopes, reef flats, and adjacent habitats. In the final listing rule, the best available information indicated this species occurs in depths ranging from 0 to 8 meters (m). However, in 2015, we learned that *A. globiceps* has been observed in American Samoa at 11 m (Asili, Tutuila) and 18 m in the National Park of American Samoa on the north side of Tutuila (D. Fenner, pers. comm., 2015). Based on the new information, we consider the rangewide depth distributions of *A. globiceps* to be 0 to 20 m. *Acropora jacquelineae* is found in numerous subtidal reef slope and back-reef habitats, including but not limited to, lower reef slopes, walls and ledges, mid-slopes, and upper reef slopes protected from wave action, and its depth range is 10 to 35 m (D. Fenner, pers. comm. 2015). *Acropora retusa* occurs in shallow reef slope and back-reef areas, such as upper reef slopes, reef flats, and shallow lagoons. In the final listing rule, the best available information indicated its depth range to be 0 to 5 m. In 2015, we learned that *A. retusa* has been observed in American Samoa at 10 m near Asili on Tutuila Island (D. Fenner, pers. comm. 2015). Based on the previously described new information combined with the fact that it's almost always found in shallower waters, we consider the rangewide depth distribution of *A. retusa* to be 0 to 10 m in this rule. *Acropora speciosa* occurs on lower reef slopes and walls, especially those characterized by clear water and high *Acropora* diversity, in a depth range of 12 to 40 m (Veron, 2014). *Euphyllia paradivisa* is found in environments protected from wave action on at least upper reef slopes, mid-slope terraces, and lagoons at a depth range of 2 to 25 m (Veron, 2014). *Isopora crateriformis*'s predominant habitat is shallow, high-wave energy environments, including reef flats and reef crests, and it also occurs in adjacent habitats such as upper reef slopes. It has a depth distribution of 0 to 12 m, and has been reported as common at 5 to 10 m (D. Fenner, pers. comm. 2015). *Seriatopora aculeata* occurs in a broad range of habitats on the reef slope and back reef, including but not limited to upper reef slopes, mid-slope terraces, lower reef slopes, reef flats, and lagoons in a depth range of 3 to 40 m (Veron, 2014).

In summary, based on the best currently available information, we consider the rangewide depth distributions of the seven listed species as follows: *A. globiceps,* 0 to 20 m; *A. jacquelineae,* 10 to 35 m; *A. retusa,* 0 to 10 m; *A. speciosa,* 12 to 40 m; *E. paradivisa,* 2 to 25 m; *I. crateriformis,* 0 to 12 m; and *S. aculeata,* 3 to 40 m (Table 1).

TABLE 1—CONFIRMED GEOGRAPHIC AND DEPTH DISTRIBUTIONS OF THREATENED INDO-PACIFIC CORALS IN THE U.S.

Jurisdiction	Am Samoa				Mariana Islands (Guam and CNMI)									Pacific Remote Island Area					
Unit [1]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A. globiceps, (0–20 m)	X	X	X	X	X	X	X	X	X	X	X	X	X	......	X	X	......	X	......
A. jacquelineae, (10–35 m)	X	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
A. retusa, (0–10 m)	X	X	X	X	X	......	......	X	......	......	......	......	......	X	......	X	X	X	X
A. speciosa, (12–40 m)	X	......	......	......	......	......	......	......	......	......	......	......	......	......	......	X	......	......	......
E. paradivisa, (2–40 m)	X	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
I. crateriformis, (0–12 m)	X	X	X	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
S. aculeata, (3–40 m)	......	......	......	......	X	......	......	......	X	......	......	......	......	......	......	......	......	......	......
Depths of all listed spp.[2]	a	b	b	b	a	b	b	b	a	b	b	b	b	c	B	a	c	b	c

[1] *Unit Key:* (1) Tutuila & Offshore Banks; (2) Ofu & Olosega; (3) Ta'u; (4) Rose Atoll; (5) Guam & Offshore Banks; (6) Rota; (7) Aguijian; (8) Tinian and Tatsumi Reef; (9) Saipan and Garapan Bank; (10) Farallon de Medinilla; (11) Anatahan; (12) Pagan; (13) Maug Islands & Supply Reef; (14) Howland Island; (15) Palmyra Atoll; (16) Kingman Reef; (17) Johnston Atoll; (18) Wake Atoll; and (19) Jarvis Island.

[2] *Depth Key:* (a) 0–40 m; (b) 0–20 m; (c) 0–10 m.

Species identification of many Indo-Pacific reef-building corals is challenging, even for experts who have worked in the field for decades. There are a multitude of reasons for this, including: Poor quality type specimens; lack of samples to verify photos; inter-specific and intra-specific morphological plasticity and variability; inherent human subjectivity; and unreliable published information. For the seven listed species considered here, current species identification uncertainty is rated as moderate or high for six species (all but *E. paradivisa*). In addition, because traditional coral identification is based on colony morphological characteristics, and recent genetics results often contradict morphological identifications, species identification uncertainty is predicted to increase for most of these species (Fenner, 2015).

Critical Habitat Identification and Designation

The purpose of designating critical habitat is to identify the areas that are essential to the species' recovery. Once critical habitat is designated, it can contribute to the conservation of listed species in several ways, including by identifying areas where Federal agencies can focus their section 7(a)(1) conservation programs, and helping focus the efforts of other conservation partners, such as States and local governments, nongovernmental organizations, and individuals (81 FR 7414, February 11, 2016). Designating critical habitat also provides a significant regulatory protection by ensuring that the Federal government considers the effects of its actions in accordance with section 7(a)(2) of the ESA and avoids or modifies those actions that are likely to destroy or adversely modify critical habitat. This requirement is in addition to the section 7 requirement that Federal agencies ensure that their actions are not likely to jeopardize the continued existence of ESA-listed species. Critical habitat requirements do not apply to citizens engaged in activities on private land that do not involve a Federal agency.

Section 3(5)(A) of the ESA defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species (16 U.S.C. 1532(5)(A)). Conservation is defined in section 3 of the ESA as 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 this chapter are no longer necessary (16 U.S.C. 1532(3)). Therefore, critical habitat is the habitat essential for the species' recovery. However, section 3(5)(C) of the ESA clarifies that, except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species.

To identify and designate critical habitat, we considered information on the distribution of the seven threatened Indo-Pacific corals, their major life stages, habitat requirements of those life stages, threats to the species, and conservation objectives that can be supported by identifiable essential physical or biological features (hereafter also referred to as ''PBFs'' or ''essential features''). In the final listing rule, ocean warming, diseases, ocean acidification, trophic effects of reef fishing, nutrient enrichment, sedimentation, and inadequacy of regulatory mechanisms were found to be the main threats contributing to the threatened status of all seven corals. Several other threats also contributed to the species' statuses, but were considered to be relatively lower in importance as compared to the main threats. Therefore, we evaluated physical and biological features of their habitats to determine what features are essential to the conservation of each coral.

Accordingly, our step-wise approach for identifying potential critical habitat areas for the threatened corals was to determine: (1) The geographical area occupied by each coral at the time of listing; (2) the physical or biological features essential to the conservation of the corals; (3) whether those features may require special management considerations or protection; (4) the specific areas of the occupied geographical area where these features occur; and, (5) whether any unoccupied areas are essential to the conservation of any of the corals.

Geographical Area Occupied by the Species

''Geographical area occupied'' in the definition of critical habitat is interpreted to mean the entire range of the species at the time it was listed, inclusive of all areas they use and move through seasonally (81 FR 7413; February 11, 2016). We did not consider geographical areas outside of the United States because we cannot designate critical habitat areas outside of U.S. jurisdiction (50 CFR 424.12(g)). As noted previously, seven of the listed species have been confirmed within U.S. Pacific Islands waters (Table 1), and only these seven are currently being considered for critical habitat designation. We first identified the U.S. jurisdictional areas where observations of listed coral species have been confirmed. In summary, six listed species are confirmed in American Samoa (*A. globiceps, A. jacquelineae, A. speciosa, A. retusa, I. crateriformis,* and *E. paradivisa*); three listed species are confirmed in Guam and CNMI (*A. globiceps, A. retusa,* and *S. aculeata*); and three listed species are confirmed in PRIA (*A. globiceps, A. retusa,* and *A. speciosa*). We further broke down the areas under consideration for critical habitat designation into 19 units based on information on the confirmed locations of each species within these jurisdictions, in order to better describe the geographic areas occupied by each species. The units generally consist of individual islands or atolls and nearby shoals or banks. Table 1 shows the distributions of the seven listed species by both jurisdiction and critical habitat unit. The proposed units are shown in the figures at the end of this rule. More detailed information on the distributions of the seven listed species in these units is provided in the Draft Information Report (NMFS, 2019).

Physical or Biological Features Essential for Conservation

Within the geographical area occupied, critical habitat consists of specific areas on which are found those PBFs essential to the conservation of the species and that may require special management considerations or protection. PBFs essential to the conservation of the species are defined as the features that occur in specific areas and that are essential to support the life-history needs of the species, including water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic, or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity (50 CFR 424.02).

In the final listing rule, we determined that the seven corals were threatened under the ESA. This means that while the species are not in danger of extinction currently, they are likely to become so within the next several decades based on their current abundances and trends in abundance, distributions, and threats they experience now and in the future. The goal of an ESA listing is to first prevent extinction, and then to recover the species so they no longer meet the definition of a threatened species and no longer need the protections of the ESA. One of the first steps in recovery planning we completed after listing these coral species was to develop a Recovery Outline that contains a Recovery Vision, which describes what the state of full recovery looks like for the species. We identified the following Recovery Vision for the 15 Indo-Pacific corals listed in 2014, including the 7 species covered by this critical habitat rule: Populations of the 15 listed Indo-Pacific corals should be present throughout as much of their historical ranges as future environmental changes will allow, and may expand their ranges into new locations with more favorable habitat conditions in the future (*https://www.fisheries.noaa.gov/resource/document/15-indo-pacific-coral-species-recovery-outline*). Recovery of these species will require conservation of the coral reef ecosystem through threats abatement to ensure a high probability of survival into the future (NMFS, 2015). The key conservation objective that facilitates this Recovery Vision, and that can be assisted through these critical habitat designations, is supporting successful reproduction and recruitment, and survival and growth of all life stages, by abating threats to the corals' habitats. In the final listing rule, we identified the major threats contributing to the seven corals' extinction risk: Ocean warming, disease, ocean acidification, trophic effects of reef fishing, nutrient enrichment, and sedimentation. Five of the six major threats (*i.e.,* all but disease) impact corals in part by changing the corals' habitat, making it unsuitable for them to carry out the essential functions at all life stages. Although it was not considered to be posing a major threat at the time of listing, we also identified contaminants as a potential threat to each of these corals (79 FR 53852, September 10, 2014). Thus, we identify ocean warming, ocean acidification, trophic effects of reef fishing, nutrient enrichment, sedimentation, and contaminants as the threats to the seven corals' habitat that are impeding their recovery. Protecting essential features of the corals' habitat from these threats will facilitate the Recovery Vision.

We then turned to determining the physical or biological features essential to this conservation objective of supporting successful reproduction and recruitment, and survival and growth of all life stages. Specifically, we evaluated whether particular habitat features will facilitate recovery through enhancing population growth. There are many physical and biological features that are important in supporting the corals' habitat; therefore, we focused on a composite habitat feature that supports the conservation objective through its relevance to the major threats and threats impeding recovery. The essential feature we ultimately identified is sites with a complex combination of substrate and water column characteristics that support normal functions of all life stages of the corals. Due to corals being sessile for almost their entire life cycle, they carry out most of their demographic functions in one location. Thus, we have identified sites with a combination of certain substrate and water column characteristics as the essential feature. A detailed discussion of how this feature was determined will follow. Specifically, these sites have attributes that determine the quality of the appropriate attachment substrate, in association with warm, aragonite-supersaturated, oligotrophic, clear marine water, which are essential to reproduction and recruitment, survival, and growth of all life stages of all seven species of coral. These sites can be impacted by ocean acidification and ocean warming, trophic effects of reef fishing, nutrient enrichment, sedimentation, and contamination.

Based on the best scientific information available we identify the following physical feature essential to the conservation of the seven corals. Our proposed definition for the essential feature is:

Reproductive, recruitment, growth, and maturation habitat. Sites that support the normal function of all life stages of the corals are natural, consolidated hard substrate or dead coral skeleton free of algae and sediment at the appropriate scale at the point of larval settlement or fragment reattachment, and the associated water column. Several attributes of these sites determine the quality of the area and influence the value of the associated feature to the conservation of the species:

(1) Substrate with presence of crevices and holes that provide cryptic habitat, the presence of microbial biofilms, or presence of crustose coralline algae;

(2) Reefscape (all the visible features of an area of reef) with no more than a thin veneer of sediment and low occupancy by fleshy and turf macroalgae;

(3) Marine water with levels of temperature, aragonite saturation, nutrients, and water clarity that have been observed to support any demographic function; and

(4) Marine water with levels of anthropogenically-introduced (from humans) chemical contaminants that do not preclude or inhibit any demographic function.

As described in detail in the Draft Information Report (NMFS, 2019), all corals require exposed natural consolidated hard substrate for the settlement and recruitment of larvae or asexual fragments. Substrate provides the physical surface and space necessary for settlement of coral larvae, a stable environment for metamorphosis of the larvae into the primary polyp, growth of juvenile and adult colonies, and re-attachment of fragments. Larvae can settle and attach to dead coral skeleton (Brainard *et al.,* 2011). A number of attributes have been shown to influence coral larval settlement. Positive cues include the presence of crustose coralline algae (Heyward and Negri, 1999), biofilms (Webster *et al.,* 2004), and cryptic habitat such as crevices and holes (Nozawa, 2008). Attributes that negatively affect settlement include presence of sediment and algae (Vermeij *et al.,* 2009). Coral recruitment tends to be greater when macroalgal biomass is low (Birrell *et al.,* 2005). In addition to preempting space for coral larvae settlement, many fleshy macroalgae produce substances that may inhibit larval settlement, recruitment, and survival (Jompa and McCook, 2003). Furthermore, algal turfs can trap sediments (Purcell and Bellwood, 2001), which then create the potential for algal turfs and sediments to act in combination to hinder coral settlement (Birrell *et al.,* 2005).

Presence and amount of sediment is a particularly important determinant of the quality of substrate for reef-building coral habitat. Sediments enter the reef environment through many processes that are natural or anthropogenic in origin, including erosion of the coastline, resuspension of bottom sediments, terrestrial run-off, and nearshore dredging for coastal construction projects and navigation purposes. The rate of sedimentation affects reef distribution, community structure, growth rates, and coral recruitment (Dutra *et al.,* 2006). Sediment accumulation on dead coral skeletons and exposed hard substrate reduces the amount of available substrate for coral larvae settlement and fragment reattachment (Rogers, 1990). Sediment impedes settlement of coral larvae (Babcock and Smith, 2002). The deeper the sediment, the longer it may take for natural waves and currents to remove the sediment from the settlement substrate. Sediment texture also affects the severity of impacts to corals and recruitment substrate. Fine grain sediments have greater negative effects to live coral tissue and to recruitment substrate (Erftemeijer *et al.,* 2012). Accumulation of sediments is also a major cause of mortality in coral recruits (Fabricius *et al.,* 2003). In some instances, if mortality of coral recruits does not occur under heavy sediment conditions, then settled coral planulae may undergo reverse metamorphosis and die in the water column (Te, 1992). Accumulation of sediment can smother living corals, cover dead coral skeleton, and exposed hard substrate (Erftemeijer *et al.,* 2012; Fabricius, 2005). Sedimentation, therefore, impacts the health and survivorship of all life stages of corals (*i.e.,* adults, fragments, larvae, and recruits).

The literature provides several recommendations on maximum sediment levels for coral reefs (*i.e.,* levels that managers should strive to stay under). De'ath and Fabricius (2008) and the Great Barrier Reef Marine Park Authority (GBRMPA 2010) recommend that sediment levels on the Great Barrier Reef (GBR) be less than a mean annual sedimentation rate of 3 mg/cm^2/day, and less than a daily maximum of 15 mg/cm^2/day. Rogers (1990) recommends that sediment levels on coral reefs globally be less than a mean maximum of 10 mg/cm^2/day to maintain healthy corals, and also notes that moderate to severe effects on corals are generally expected at mean maximum sedimentation rates of 10 to 50 mg/cm^2/day, and severe to catastrophic effects at >50 mg/cm^2/day. Similarly, Erftemeijer *et al.* (2012) suggests that moderate to severe effects to corals are expected at mean maximum sediment levels of >10 mg/cm^2/day, and catastrophic effects at >50 mg/cm^2/day. Nelson *et al.* (2016) suggests that sediment depths of >0.5 cm result in substantial stress to most coral species, and that sediment depths of >1.0 cm are lethal to most coral species. The previously described generalizations are for coral reef communities and ecosystems, rather than individual species.

Sublethal effects of sediment to corals potentially occur at much lower levels than mortality. Sublethal effects include reduced growth, lower calcification rates and reduced productivity, bleaching, increased susceptibility to diseases, physical damage to coral tissue and reef structures (breaking, abrasion), and reduced regeneration from tissue damage (see reviews by Fabricius *et al.,* 2005; Erftemeijer *et al.,* 2012; Browne *et al.,* 2015; and Rogers, 1990). Erftemeijer *et al.* (2012) states that sublethal effects for coral species that are sensitive, intermediate, or tolerant to sediment (*i.e.,* most reef-building coral species) occur at mean maximum sedimentation rates of between <10 and 200 mg/cm^2/day, depending on species, exposure duration, and other factors.

Finally, artificial substrates and frequently disturbed ''managed areas'' are not essential to coral conservation. Only natural substrates provide the quality and quantity of recruitment habitat necessary for the conservation of threatened corals. Artificial substrates are generally less functional than natural substrates in terms of supporting healthy and diverse coral reef ecosystems (Edwards and Gomez, 2007; USFWS, 2004). Artificial substrates are typically man-made or introduced substrates that are not naturally occurring to the area. Examples include, but are not necessarily limited to, fixed and floating structures, such as aids-to-navigation (AToNs), jetties, groins, breakwaters, seawalls, wharves, boat ramps, fishpond walls, pipes, wrecks, mooring balls, docks, aquaculture cages, and other artificial substrates. Our definition of recruitment substrate does not include any artificial substrate. In addition, there are some natural substrates that, because of their consistently disturbed nature, also do not provide the quality of substrate necessary for the conservation of threatened corals. While these areas may provide hard substrate for coral settlement and growth over short periods, the periodic nature of direct human disturbance renders them poor environments for coral growth and survival over time (*e.g.,* they can become covered with sediment). Therefore, they are not essential to the conservation of the species. Specific areas that may contain these disturbed natural substrates are described in the *Specific Areas Containing the Essential Features within the Geographical Areas Occupied by the Species* section of this proposed rule.

The substrate characterized previously must be associated with water that also supports all life functions of corals that are carried out at the site. Water quality conditions fluctuate greatly over various spatial and temporal scales in natural reef environments (Kleypas *et al.,* 1999). However, certain levels of particular parameters (*e.g.,* water clarity, water temperature, aragonite saturation) must exist on average to provide the conditions conducive to coral growth, reproduction, and recruitment. Corals may tolerate and survive in conditions outside these levels, depending on the local conditions to which they have acclimatized and the intensity and duration of any deviations from conditions conducive to a particular coral's growth, reproduction and recruitment. Deviations from tolerance levels of certain parameters result in direct negative effects on all life stages.

As described in the Draft Information Report, corals thrive in warm, clear, nutrient-poor marine waters with calcium carbonate concentrations that allow for symbiont photosynthesis, coral physiological processes and skeleton formation. This water must also have low to no levels of contaminants (*e.g.,* heavy metals, chemicals) that would interfere with normal functions of all life stages. Water quality that supports normal functions of corals is adversely affected by ocean warming, ocean acidification, nutrient enrichment, sedimentation, and contamination.

Seawater temperature is a particularly important limiting factor of coral habitat, and consequently ocean warming is one of the most important threats to reef-building corals. Corals occur in a wide temperature range across geographic locations (15.7°C–35.5°C weekly average and 21.7–29.6°C annual average; Guan *et al.,* 2015), but only thrive in areas with mean temperatures in a narrow range (typically 25°C–29°C) as indicated by the global distribution of coral reefs (Brainard *et al.,* 2011; Kleypas *et al.,* 1999). Short-term exposures (days) to temperature increases of a few degrees (*i.e.,* 3°C–4°C increase above mean maximum summer temperature) or long-term exposures (several weeks) to minor temperature increases (*i.e.,* 1°C–2°C above mean maximum summer temperature) can cause significant thermal stress and mortality to most coral species (Berkelmans and Willis, 1999; Jokiel and Coles, 1990). In addition to coral bleaching, elevated seawater temperatures impair coral fertilization and settlement (Nozawa and Harrison, 2007) and cause increases in coral disease (Miller *et al.,* 2009).

Effects of elevated seawater temperatures are well-studied for reef-building corals, and many approaches have been used to estimate temperature thresholds for coral bleaching and mortality (see reviews by Brown, 1997; Berkelmans, 2002; Coles and Brown, 2003; Jokiel, 2004; Baker *et al.,* 2007; Jones, 2008; Coles and Riegl, 2013). The tolerance of corals to temperature is species-specific (van Woesik *et al.,* 2011; Vega-Rodriguez, 2016) and depends on suites of other variables that include acclimation temperature, aragonite saturation state, dissolved inorganic nitrogen (Cunning and Baker, 2012; Fabricius, 2005; Wooldridge, 2013); and physical, physiological, and chemical stressors, including suspended sediments and turbidity (Anthony *et al.,* 2007; Woods *et al.,* 2016); trace metals such as copper (Negri and Hoogenboom, 2011; Woods *et al.,* 2016); ultraviolet radiation (Anthony *et al.,* 2007); and salinity, nitrates, and phosphates (Negri and Hoogenboom, 2011).

Ocean warming is one of the most significant threats to the seven ESA-listed Indo-Pacific corals. Mean seawater temperatures in reef-building coral habitat in the Indo-Pacific have increased during the past few decades, and are predicted to continue to rise between now and 2100 (IPCC, 2013). The primary observable coral response to ocean warming is bleaching of adult coral colonies, wherein corals expel their symbiotic zooxanthellae in response to stress (Brown, 1997). Even so, evaluating the effects that changes in water temperatures have on the conservation value of coral habitat is very complex and contextually-driven, and simple numeric effect thresholds are not easily assigned to listed corals to establish when stress responses occur. For many corals, an episodic increase of only 1°C–2°C above the normal local seasonal maximum ocean temperature can induce bleaching (Hoegh-Guldberg *et al.,* 2007; Jones, 2008). Corals can withstand mild to moderate bleaching; however, severe, repeated, or prolonged bleaching can lead to colony death (Brown, 1997). In addition to coral bleaching, other effects of ocean warming detrimentally affect virtually every life-history stage in reef-building corals. Impaired fertilization and developmental abnormalities (Negri and Heyward, 2000), mortality, and impaired settlement success (Nozawa and Harrison, 2007) have all been documented. Increased seawater temperature also may act synergistically with coral diseases to reduce coral health and survivorship (Bruno and Selig, 2007). Coral disease outbreaks often have either accompanied or immediately followed bleaching events (Jones *et al.,* 2004; Miller *et al.,* 2009). Outbreaks also follow seasonal patterns of high seawater temperatures (Willis *et al.,* 2004).

Coles and Brown (2003) defined a general bleaching threshold for reef-building corals as increases in seawater temperatures of 1–3°C above maximum annual mean temperatures at a given location. GBRMPA (2010) defined a general ''trigger value'' for bleaching in reef-building corals as increases in seawater temperatures of no more than 1°C above maximum annual mean temperatures at a given location. Because duration of exposure to elevated temperatures determines the extent of bleaching, several methods have been developed to integrate duration into bleaching thresholds, including the number of days, weeks, or months of the elevated temperatures (Berkelmans, 2002; Eakin *et al.,* 2009). NOAA's Coral Reef Watch Program utilizes the Degree Heating Week method (Glynn and D'Croz, 1990; Eakin *et al.* 2009), which defines a general bleaching threshold for reef-building corals as seawater temperatures of 1°C above maximum monthly mean at a given location for four consecutive weeks (*https://coralreefwatch.noaa.gov/*).

These general thresholds were developed for coral reef communities and ecosystems, rather than individual species. Many of these studies are community or ecosystem-focused and do not account for species-specific responses to changes in seawater temperatures, and instead are focused on long-term climatic changes and large scale impacts (*e.g.,* coral reef distribution, persistence).

In summary, temperature deviations from local averages prevent or impede successful completion of all life history stages of the listed coral species. Identifying temperatures at which the conservation value of habitat for listed corals may be affected is inherently complex and influenced by taxa, exposure duration, and other factors.

Carbonate ions (CO_3^{2-}) are used by many marine organisms, including corals, to build calcium carbonate skeletons. For corals, the mineral form of calcium carbonate in their skeletons is called ''aragonite.'' The more carbonate ions there are dissolved in seawater, the easier it is for corals to build their aragonite skeletons. The metric used to express the relative availability of calcium and carbonate ions is the aragonite saturation state (Ω_{arg}). Thus, the lower the Ω_{arg} of seawater, the lower the abundance of carbonate ions, and the more energy corals have to expend for skeletal calcification, and vice versa (Cohen and Holcomb, 2009). At saturation states between 1 and 20, marine organisms can create calcium carbonate shells or skeletons using a physiological calcifying mechanism and the expenditure of energy. The aragonite saturation state varies greatly within and across coral reefs and through daily cycles with temperature, salinity, pressure, and localized biological processes such as photosynthesis, respiration, and calcification by marine organisms (Gray *et al.,* 2012; McMahon *et al.,* 2013; Shaw *et al.,* 2012b).

Coral reefs form in an annually-averaged saturation state of 4.0 or greater for optimal calcification, and an annually-averaged saturation state below 3.3 will result in reduced calcification at rates insufficient to maintain net positive reef accretion, resulting in loss of reef structure (Guinotte *et al.,* 2003; Hoegh-Guldberg *et al.,* 2007). Guinotte *et al.* (2003) classified the range of aragonite saturation states between 3.5–4.0 as ''adequate'' and < 3 as ''extremely marginal.'' Thus, aragonite saturation state between 3 and 4 is likely necessary for coral calcification. But, generally, seawater Ω_{arg} should be 3.5 or greater to enable maximum calcification of reef-building corals, and average Ω_{arg} in most coral reef areas is currently in that range (Guinotte *et al.,* 2003). Further, (Kleypas *et al.,* 1999) concluded that a general threshold for Ω_{arg} occurs near 3.4, because only a few reefs occur where saturation is less than this. Guan *et al.* (2015) found that the minimum aragonite saturation observed where coral reefs currently occur is 2.82; however, it is not known if those locations hosted live accreting corals. These general characterizations and thresholds were identified for coral reef communities and ecosystems, rather than individual species.

Ocean acidification is a term referring to changes in ocean carbonate chemistry, including a drop in the pH of ocean waters, that is occurring in response to the rise in the quantity of atmospheric CO_2 and the partial pressure of CO_2 (pCO_2) absorbed in oceanic waters (Caldeira and Wickett, 2003). As pCO_2 rises, oceanic pH declines through the formation of carbonic acid and subsequent reaction with water resulting in an increase of free hydrogen ions. The free hydrogen ions react with carbonate ions to produce bicarbonate, reducing the amount of carbonate ions available, and thus reducing the aragonite saturation state. Ocean acidification is one of the most significant threats to reef-building corals (Brainard *et al.,* 2011; Jokiel, 2015).

A variety of laboratory studies conducted on corals and coral reef organisms (*e.g.,* Langdon and Atkinson, 2005) consistently show declines in the rate of coral calcification and growth with rising pCO_2, declining pH, and declining carbonate saturation state. Laboratory experiments have also shown that skeletal deposition and initiation of calcification in newly settled corals is reduced by declining aragonite saturation state (Albright *et al.,* 2008; Cohen *et al.,* 2009). Field studies from a variety of coral locations in the Caribbean, Indo-Pacific, and Red Sea have shown a decline in linear extension rates of coral skeleton under decreasing aragonite saturation state (Bak *et al.,* 2009; De'ath *et al.,* 2009; Schneider and Erez, 2006; Tanzil *et al.,* 2009). Reduced calcification and slower growth will mean slower recovery from breakage, whether natural (hurricanes and storms) or human (breakage from vessel groundings, anchors, fishing gear, etc.), or mortality from a variety of disturbances. Slower growth also implies even higher rates of mortality for newly settled corals due to the longer time it will take to reach a colony size that is no longer vulnerable to overgrowth competition, sediment smothering, and incidental predation. Reduced calcification and slower growth means more time to reach reproductive size and reduces sexual and asexual reproductive potential. Increased pCO_2 coupled with increased sea surface temperature can lead to even lower rates of calcification, as found in the meta-analysis by Kornder *et al.* (2018).

In summary, aragonite saturation reductions prevent or impede successful completion of all life history stages of the listed coral species. Identifying the declining aragonite saturation state at which the conservation value of habitat for listed corals may be affected is inherently complex and influenced by taxa, exposure duration, acclimatization to localized nutrient regimes, and other factors.

Nitrogen and phosphorous are two of the main nutrients that affect the suitability of coral habitat (Fabricius *et al.,* 2005; Fabricius, 2005). These two nutrients occur as different compounds in coral reef habitats and are necessary in low levels for normal reef function. Dissolved inorganic nitrogen and dissolved inorganic phosphorus in the forms of nitrate (NO_3) and phosphate ($PO4_3$) are particularly important for photosynthesis, with dissolved organic nitrogen also providing an important source of nitrogen, and are the dominant forms of nitrogen and phosphorous in coral reef waters. Nutrients are a major component of land-based sources of pollution (LBSP), one of the most important threats to reef-building corals (Brainard *et al.,* 2011). Excessive nutrients affect corals through two main mechanisms: direct impacts on coral physiology such as reduced fertilization and growth (Harrison and Ward, 2001; Ferrier-Pages *et al.,* 2000), and indirect effects through nutrient-stimulation of other community components (*e.g.,* macroalgae seaweeds, turfs/filamentous algae, cyanobacteria, and filter feeders) that compete with corals for space on the reef (79 FR 53851, September 10, 2014). As discussed previously, the latter also affects the quality of recruitment substrate. The physiological response a coral exhibits to an increase in nutrients mainly depends on concentration and duration. A short duration of a large increase in a nutrient may result in a severe adverse response, just as a chronic, lower concentration might.

Most coral reefs occur where annual mean nutrient levels are low. Kleypas *et al.* (1999) analyzed dissolved nutrient data from nearly 1,000 coral reef sites, finding mean values of 0.25 micromoles per liter (µmol/l) for NO_3, and 0.13 µmol/l for PO_4. Over 90 percent of the sites had mean NO_3 values of <0.6 µmol/l, and mean PO_4 values of <0.2 µmol/l (Kleypas *et al.,* 1999). Several authors, including Bell and Elmetri (1995) and Lapointe (1997) have proposed threshold values of 1.0 µmol/l for NO_3, and 0.1–0.2 µmol/l for PO_4, above which NO_3 and PO_4 are excessive (eutrophic). However, concentrations of dissolved nutrients are poor indicators of coral reef status, and the concept of a simple threshold concentration that indicates eutrophication has little validity (McCook *et al.,* 1999). One reason for that is because corals are exposed to nutrients in a variety of forms, including dissolved nitrogen (*e.g.,* NO_3), dissolved phosphorus (*e.g.,* $PO4_3$), particulate nitrogen (PN), and particulate phosphate (PP). Since the dissolved forms are assimilated rapidly by phytoplankton, and the majority of nitrogen and phosphorus discharged in terrestrial runoff is in the particulate forms, PN and PP are the most common bio-available forms of nutrients for corals on coastal zone reefs (Cooper and Fabricius, 2007). Thus, De'ath and Fabricius (2008) and GBRMPA (2010) provide general recommendations on maximum annual mean values for PN and PP of 1.5 μmol/l PN and 0.09 μmol/l PP for coastal zone reefs. These generalizations are for coral reef communities and ecosystems, rather than individual species.

As noted previously, identifying nutrient concentrations at which the conservation value of habitat for listed corals may be affected is inherently complex and influenced by taxa, exposure duration, and acclimatization to localized nutrient regimes, and other factors.

Water clarity or transparency is a key factor for marine ecosystems and it is the best explanatory variable for a range of bioindicators of reef health (Fabricius *et al.,* 2012). Water clarity affects the light availability for photosynthetic organisms and food availability for filter feeders. Corals depend upon their symbiotic algae for nutrition and thus depend on light availability for algal photosynthesis. Reduced water clarity is determined by the presence of particles of sediment, organic matter, and/or plankton in the water, and so is often associated with elevated sedimentation and/or nutrients. Water clarity can be measured in multiple ways, including percent of solar irradiance at depth, Secchi depth (the depth in the water column at which a black and white disk is no longer visible), and Nephelometric Turbidity Unit (NTU) (measure of light scatter based on particles in the water column). Reef-building corals naturally occur across a broad range of water clarity levels from very turbid waters on enclosed reefs near river mouths (Browne *et al.,* 2012) to very clear waters on offshore barrier reefs, and many intermediate habitats such as open coastal and mid-shelf reefs (GBRMPA, 2010). Coral reefs appear to thrive in extremely clear areas where Secchi depth is ≥ 15 m or light scatter is < 1 NTU (De'ath and Fabricius, 2010). Typical levels of total suspended solids (TSS) in reef environments are less than 10 mg/L (Rogers, 1990). The minimum light level for reef development is about 6–8 percent of surface irradiance (Fabricius *et al.,* 2014).

For a particular coral colony, tolerated water clarity levels likely depend on several factors, including species, life history stage, spatial variability, and temporal variability. For example, colonies of a species occurring on fringing reefs around high volcanic islands with extensive groundwater inputs are likely to be better acclimatized or adapted to higher turbidity than colonies of the same species occurring on offshore barrier reefs or around atolls with very little or no groundwater inputs. In some cases, corals occupy naturally turbid habitats (Anthony and Larcombe, 2000; McClanahan and Obura, 1997; Te, 2001) where they may benefit from the reduced amount of UV radiation to which they are exposed (Zepp *et al.,* 2008). Reductions in water clarity affect light availability for corals. As turbidity and nutrients increase, thus decreasing water clarity, reef community composition shifts from coral-dominated to macroalgae-dominated, and ultimately to heterotrophic animals (Fabricius *et al.,* 2012). Light penetration is diminished by suspended abiotic and biotic particulate matter (especially clay and silt-sized particles) and some dissolved substances (Fabricius *et al.,* 2014). The availability of light decreases directly as a function of particle concentration and water depth, but also depends on the nature of the suspended particles. Fine clays and organic particles are easily suspended from the sea floor, reducing light for prolonged periods, while undergoing cycles of deposition and resuspension. Suspended fine particles also carry nutrients and other contaminants (Fabricius *et al.,* 2013). Increased nutrient runoff into semi-enclosed seas accelerates phytoplankton production to the point that it also increases turbidity and reduces light penetration, and can also settle on colony surfaces (Fabricius, 2005). In areas of nutrient enrichment, light for benthic organisms can be additionally severely reduced by dense stands of large fleshy macroalgae shading adjacent corals (Fabricius, 2005).

The literature provides several recommendations on maximum turbidity levels for coral reefs (*i.e.,* levels that managers should strive to stay under). GBRMPA (2010) recommends minimum mean annual water clarity, or ''trigger values'', in Secchi distances for the GBR depending on habitat type: For enclosed coastal reefs, 1.0–1.5 m; for open coastal reefs and mid-shelf reefs, 10 m; and for offshore reefs, 17 m. De'ath and Fabricius (2008) recommend a minimum mean annual water clarity trigger value in Secchi distance averaged across all GBR habitats of 10 m. Bell and Elmetri (1995) recommend a maximum value of 3.3 mg/L TSS across all GBR habitats. Thomas *et al.* (2003) recommend a maximum value of 10 mg/L averaged across all Papua New Guinea coral reef habitats. Larcombe *et al.* (2001) recommend a maximum value of 40 mg/L TSS for GBR ''marginal reefs'', *i.e.,* reefs close to shore with high natural turbidity levels. Guan *et al.* (2015) recommend a minimum light intensity (μmol photons second/m2) of 450 μmol photons second/m2 globally for coral reefs. The previously described generalizations are for coral reef communities and ecosystems, rather than individual species.

A coral's response to a reduction in water clarity is dependent on intensity and duration. For example, corals exhibited partial mortality when exposed to 476 mg/L TSS (Bengtsson *et al.,* 1996) for 96 hours, but had total mortality when exposed to 1000 mg/L TSS for 65 hours (Thompson and Bright, 1980). Depending on the duration of exposure, most coral species exhibited sublethal effects when exposed to turbidity levels between 7 and 40 NTU (Erftemeijer *et al.,* 2012). The most tolerant coral species exhibited decreased growth rates when exposed to 165 mg/L TSS for 10 days (Rice and Hunter, 1992). Turbidity reduces water clarity and so reduces the maximum depth at which corals can live, making deeper habitat unsuitable (Fabricius, 2005). Existing data suggest that coral reproduction and settlement are more highly sensitive to changes in water clarity than adult survival, and these functions are dependent on clear water. Suspended particulate matter reduces fertilization and sperm function (Ricardo *et al.,* 2015), and strongly inhibits larvae survival, settlement, recruitment, and juvenile survival (Fabricius, 2005).

In summary, water clarity deviations from local averages prevent or impede successful completion of all life history stages of the listed coral species. Identifying turbidity levels at which the conservation value of habitat for listed corals may be affected is inherently complex and influenced by taxa, exposure duration, and acclimatization to localized nutrient regimes, and other factors.

The water column may include levels of anthropogenically-introduced chemical contaminants that prevent or impede successful completion of all life history stages of the listed coral species. For the purposes of this rule, ''contaminants'' is a collective term to describe a suite of anthropogenically-introduced chemical substances in water or sediments that may adversely affect corals. The study of the effects of contaminants on corals is a relatively new field and information on sources and ecotoxicology is incomplete. The major groups of contaminants that have been studied for effects to corals include heavy metals (also called trace metals), pesticides, and hydrocarbons. Other organic contaminants, such as chemicals in personal care products, polychlorinated biphenyl, and surfactants, have also been studied. Contaminants may be delivered to coral reefs via point or non-point sources. Specifically, contaminants enter the marine environment through wastewater discharge, shipping, industrial activities, and agricultural and urban runoff. These contaminants can cause negative effects to coral reproduction, development, growth, photosynthesis, and survival.

Heavy metals (*e.g.,* copper, cadmium, manganese, nickel, cobalt, lead, zinc, and iron) can be toxic at concentrations above naturally-occurring levels. Heavy metals are persistent in the environment and can bioaccumulate. Metals are adsorbed to sediment particles, which can result in their long distance transport away from sources of pollution. Corals incorporate metals in their skeleton and accumulate them in their soft tissue (Al-Rousan *et al.,* 2012; Barakat *et al.,* 2015). Although heavy metals can occur in the marine environment from natural processes, in nearshore waters they are mostly a result of anthropogenic sources (*e.g.,* wastewater, antifouling and anticorrosive paints from marine vessels and structures, land filling and dredging for coastal expansion, maritime activities, inorganic and organic pollutants, crude oil pollution, shipping processes, industrial discharge, agricultural activities), and are found near cities, ports, and industrial developments.

The effects of copper on corals include physiological impairment, impaired photosynthesis, bleaching, reduced growth, and DNA damage (Bielmyer *et al.,* 2010; Schwarz *et al.,* 2013). Effects to fertilization, larval development, larval swimming behavior, metamorphosis, and larval survival have also been documented (Kwok and Ang, 2013; Negri and Hoogenboom, 2011; Puisay *et al.,* 2015; Reichelt-Brushett and Hudspith, 2016; Rumbold and Snedaker, 1997). Toxicity of copper was found to be higher when temperatures are elevated (Negri and Hoogenboom, 2011). Nickel and cobalt can also have negative effects on corals, such as reduced growth and photosynthetic rates (Biscere *et al.,* 2015), and reduced fertilization success (Reichelt-Brushett and Hudspith, 2016). Chronic exposure of corals to higher levels of iron may significantly reduce growth rates Ferrier-Pages *et al.* (2001). Further, iron chloride has been found to cause oxidative DNA damage to coral larvae (Vijayavel *et al.,* 2012).

Polycyclic aromatic hydrocarbons (PAHs) are found in fossil fuels such as oil and coal and can be produced by the incomplete combustion of organic matter. PAHs disperse through non-point sources such as road run-off, sewage, and deposition of particulate air pollution. PAHs can also disperse from point sources such as oil spills and industrial sites. Studies have found effects of oil pollution on corals include growth impairments, mucus production, and decreased reproduction, especially at increased temperature (Kegler *et al.,* 2015). Hydrocarbons have also been found to affect early life stages of corals. Oil-contaminated seawater reduced settlement of *Orbicella faveolata* and of *Agaricia humilis* and was more severe than any direct or latent effects on survival (Hartmann *et al.,* 2015). Natural gas (water accommodated fraction) exposure resulted in abortion of larvae during early embryogenesis and early release of larvae during late embryogenesis, with higher concentrations of natural gas yielding higher adverse effects (Villanueva *et al.,* 2011). Oil, dispersant, and a combination of oil and dispersant on significantly decreased settlement and survival of *Porites astreoides* and *O. faveolata* larvae (Goodbody-Gringley *et al.,* 2013).

Anthracene (a PAH used in dyes, wood preservatives, insecticides, and coating materials) exposure to apparently healthy and diseased (Caribbean yellow band disease) fragments of *O. faveolata* reduced activity of enzymes important for protection against environmental stressors in the diseased colonies (Montilla *et al.,* 2016). The results indicated that diseased tissues might be more vulnerable to the exposure to PAHs such as anthracene than apparently healthy corals. PAH concentrations similar to those present after an oil spill inhibited metamorphosis of *Acropora tenuis* larvae, and sensitivity increased when larvae were co-exposed to PAHs and ''shallow reef'' UV light levels (Negri *et al.,* 2016).

Pesticides include herbicides, insecticides, and antifoulants used on vessels and other marine structures. Pesticides can affect non-target marine organisms like corals and their zooxanthellae. Diuron, an herbicide, decreased photosynthesis isolated zooxanthellae (Shaw *et al.,* 2012b). Irgarol, an additive in copper-based antifouling paints, significantly reduced settlement in *Porites hawaiiensis* (Knutson *et al.,* 2012). *Porites astreoides* larvae exposed to two major mosquito pesticide ingredients, naled and permethrin, for 18–24 hours showed differential responses. Concentrations of 2.96 μg/L or greater of naled significantly reduced larval survivorship. However, reduced larval survivorship was not detected in exposure of up to 6.0 μg/L of permethrin. Larval settlement, post-settlement survival, and zooxanthellae density were not impacted by any treatment (Ross *et al.,* 2015).

Benzophenone-2 (BP-2) is a chemical additive to personal care products (*e.g.,* shampoo, body lotions, soap, detergents), product coatings (oil-based paints, polyurethanes), acrylic adhesives, and plastics that protects against damage from ultraviolet light. It is released into the ocean through municipal and boat/ship wastewater discharges, landfill leachates, residential septic fields, and unmanaged cesspits. BP-2 is a known endocrine disruptor and a DNA mutagen, and its effects are worse in the light. It caused deformation of *Stylophora pistillata* larvae changing them from a motile planktonic state to a deformed sessile condition at low concentrations. It also caused increasing larval bleaching with increasing concentration (Downs *et al.,* 2014). Benzophenone-3 (BP-3; oxybenzone) is an ingredient in sunscreen and personal care products (*e.g.,* hair cleaning and styling products, cosmetics, insect repellent, soaps) that protects against damage from ultraviolet light. It enters the marine environment through swimmers and municipal, residential, and boat/ship wastewater discharges and can cause DNA mutations. Oxybenzone is a skeletal endocrine disruptor, and it caused larvae of *S. pistillata* to encase themselves in their own skeleton. Exposure to oxybenzone transformed *S. pistillata* larvae from a motile state to a deformed, sessile condition. Larvae exhibited an increasing rate of coral bleaching in response to increasing concentrations of oxybenzone (Downs *et al.,* 2016).

Polychlorinated biphenyls (PCBs) are environmentally stable, persistent organic pollutants that have been used as heat exchange fluids in electrical transformers and capacitors, and as additives in paint, carbonless copy paper, and plastics. They can be transported globally through the atmosphere, water, and food web. A study of the effects of the PCB Aroclor 1254 on the scleractinian coral *S. pistillata* found no effects on coral survival, photosynthesis, or growth; however, the exposure concentration and duration may alter the expression of certain genes involved in important cellular functions (Chen *et al.,* 2012).

Surfactants are used as detergents and soaps, wetting agents, emulsifiers, foaming agents, and dispersants. Linear alkylbenzene sulfonate (LAS) is one of the most common surfactants in use. Biodegradation of surfactants can occur within a few hours to several days, but significant proportions of surfactants attach to suspended solids and remain in the environment. This sorption of surfactants onto suspended solids depends on environmental factors such as temperature, salinity, or pH. Exposure of *Pocillopora verrucosa* to LAS resulted in tissue loss on fragments. The combined effects of LAS exposure with increased temperature (+3°C to 31°C) resulted in greater tissue loss than LAS exposure alone (Kegler *et al.,* 2015).

In summary, there are multiple chemical contaminants that prevent or impede successful completion of all life history stages of the listed coral species. Identifying contaminant levels at which the conservation value of habitat for listed corals may be affected is inherently complex and influenced by taxa, exposure duration, and other factors.

As described previously, the best-available information shows coral reefs form on solid substrate but only within a narrow range of water column conditions that on average allow the deposition rates of corals to exceed the rates of physical, chemical, and biological erosion (*i.e.,* conducive conditions, Brainard *et al.,* 2005). However, as with all ecosystems, water column conditions are dynamic and vary over space and time. Therefore, we also describe environmental conditions in which coral reefs currently exist globally, thus indicating the conditions that may be tolerated by corals and allow at least for survival. To the extent tolerance conditions deviate in duration and intensity from conducive conditions, they may not support coral reproduction and recruitment, and reef growth, and thus would impair recovery of the species. Further, annually and spatially averaged-tolerance ranges provide the limits of the environmental conditions in which coral reefs exist globally (Guan *et al.,* 2015), but these conditions do not necessarily represent the conditions that may be tolerated by individual coral species. Individual species may or may not be able to withstand conditions within or exceeding the globally-averaged tolerance ranges for coral reefs, depending on the individual species' biology, local average conditions to which the species are acclimatized, and intensity and duration of exposure to adverse conditions. In other words, changes in the water column parameters discussed previously that exceed the tolerance ranges may induce adverse effects in a particular species. Thus, the concept of individual species' tolerance limits is a different aspect of water quality conditions compared to conditions that are conducive for formation and growth of reef structures.

These values presented in the previous summaries constitute the best available information at the time of this rulemaking. It is possible that future scientific research will identify species-specific values for some of these parameters that become more applicable to the seven listed coral species, though it is also possible that future species-specific research will document that conducive or tolerance ranges for the seven corals fall within these ranges. Because the ESA requires us to use the best scientific information available in conducting consultations under section 7, we will incorporate any such new scientific information into consultations when evaluating potential impacts to the critical habitat.

Need for Special Management Considerations or Protection

Specific areas within the geographical area occupied by a species may be designated as critical habitat only if they contain essential features that may require special management considerations or protection (16 U.S.C. 1532(5)(A)(i)(II). Special management considerations or protection are any methods or procedures useful in protecting physical or biological features for the conservation of listed species (50 CFR 424.02).

The proposed essential feature is particularly susceptible to impacts from human activity because of the relatively shallow water depth ranges of the seven listed corals (less than 40 m). The proximity of this habitat to coastal areas subject this feature to impacts from multiple activities, including, but not limited to, coastal and in-water construction, dredging and disposal activities, beach nourishment, stormwater run-off, wastewater and sewage outflow discharges, point and non-point source pollutant discharges, and fishery management. Further, the global oceans are being impacted by climate change from greenhouse gas emissions, particularly the tropical oceans in which the Indo-Pacific corals occur (van Hooidonk *et al.,* 2014). The impacts from these activities, combined with those from natural factors (*e.g.,* major storm events), significantly affect habitat for all life stages for these threatened corals. We conclude that the essential feature is currently and will likely continue to be negatively impacted by some or all of these factors.

Greenhouse gas emissions (*e.g.,* fossil fuel combustion) lead to global climate change and ocean acidification. These activities adversely affect the essential feature by increasing sea surface temperature and decreasing the aragonite saturation state. Coastal and in-water construction, channel dredging, and beach nourishment activities can directly remove the essential feature by dredging it or by depositing sediments on it, making it unavailable for settlement and recruitment of coral larvae or fragments. These same activities can impact the essential feature by creating turbidity during operations. Stormwater run-off, wastewater and sewage outflow discharges, and point and non-point source contaminant discharges can adversely impact the essential feature by allowing nutrients and sediments, as well as contaminants, from point and non-point sources, including sewage, stormwater and agricultural runoff, river discharge, and groundwater, to alter the natural levels in the water column. The same activities can also adversely affect the essential feature by increasing the growth rates of macroalgae, allowing them to preempt available recruitment habitat. Fishery management can adversely affect the essential feature if it allows for the reduction in the number of herbivorous fishes available to control the growth of macroalgae on the substrate.

Given these ongoing threats throughout the corals' habitat, we find that the essential feature may require special management considerations.

Specific Areas Containing the Essential Features Within the Geographical Areas Occupied by the Species

Our regulations state that each critical habitat area will be shown on a map, with more-detailed information discussed in the preamble of the rulemaking documents published in the **Federal Register** defined by specific limits using reference points and lines on standard topographic maps of the area, and referencing each area by the State, county, or other local governmental unit in which it is located (50 CFR 424.12(c)). Our regulations also state that when several habitats, each satisfying requirements for designation as critical habitat, are located in proximity to one another, an inclusive area may be designated as critical habitat (50 CFR 424.12(d)).

We identified 19 units within the geographical area occupied by the seven listed Indo-Pacific species confirmed in U.S. waters, at the time of listing, that contain the essential feature (Table 1): Four in American Samoa (Tutuila and Offshore Banks, Ofu and Olosega, Ta'u, and Rose Atoll); one in Guam (Guam and Offshore Banks); eight in CNMI (Rota, Aguijian, Tinian and Tatsumi Reef, Saipan and Garapan Bank, Farallon de Medinilla, Anatahan, Pagan, and Maug Islands and Supply Reef); and six in PRIA (Howland Island, Palmyra Atoll, Kingman Reef, Johnston Atoll, Wake Atoll, and Jarvis Island).

Within each of these 19 units, we delineated more specific areas that contain the essential feature using a 3-step process: (1) We reviewed available information on substrate and water quality parameters to determine where the essential feature occurs; (2) we established upper and lower depth limits for these areas depending on the species present; and (3) within the depth limits, we identified areas that may have the essential feature but are not necessary for the conservation of the listed species because they are artificial substrates or natural substrates that are consistently disturbed, and therefore do not qualify as critical habitat.

For step 1, determining specific areas that contain the essential feature, we reviewed available substrate and water quality data for each unit. For substrate, we used data and maps from two benthic habitat mapping programs that collect benthic data for coral reef ecosystems throughout the United States (these programs are also available to the public on their websites): (1) For habitat <20 m depth, the National Centers for Coastal Ocean Science's (NCCOS; *https://coastalscience.noaa.gov/*) provides data and maps (except for some of the PRIA); and (2) for habitat >20 m depth, the Pacific Islands Benthic Habitat Mapping Center (PIBHMC; *https://www.soest.hawaii.edu/pibhmc/cms/*) provides data and maps. These two complementary programs provide nearly complete, large-scale coverage of reef-building coral substrate in the U.S. Pacific Islands, except for some of the PRIA areas which are not included in the NCCOS database. For substrate and water quality information, we also used coral reef monitoring and status reports from the Pacific Islands Fisheries Science Center (PIFSC, *https://www.fisheries.noaa.gov/region/pacific-islands#science*) for the Mariana Islands (Brainard *et al.,* 2012; except for Farallon de Medinilla (FDM)) and American Samoa (Brainard *et al.,* 2008). For the PRIA, we used Miller *et al.* (2008). In contrast to substrate, data for water quality parameters are limited to a few of the parameters over a small overall portion of reef-building coral habitat within the area under consideration for critical habitat.

We applied step 2, establishing upper and lower depth limits for these areas, by using depth distribution information for the listed coral species that occur in each unit to delineate upper and lower depth limits for each unit. Because at least some, if not all, listed corals in each unit occur in shallow habitats (*e.g.,* reef flats), the upper depth limit for all units is mean low water, referred to here as zero (0) m depth. The lower depth limit for each unit is based on the deepest observed record of any listed species in that unit. As previously described in more detail in the Background section, based on the best currently available information, we consider the rangewide depth distributions of the seven listed species as follows: *A. globiceps,* 0 to 20 m; *A. jacquelineae,* 10 to 35 m; *A. retusa,* 0 to 10 m; *A. speciosa,* 12 to 40 m; *E. paradivisa,* 2 to 25; *I. crateriformis,* 0 to 12 m; and *S. aculeata,* 3 to 40 m. We used depth distributions for all listed Indo-Pacific species within U.S. waters combined as a comprehensive approach to establish a lower limit because most listed species have overlapping depth distributions, and depth distributions of these species are still not well known for many of the critical habitat units.

We next applied step 3 for each unit by identifying areas that may contain the essential feature, but are not necessary for the conservation of the listed species. There are two types of areas that may contain hard consolidated substrate and suitable water quality parameters, but are not considered necessary for the conservation of the species, and none, one, or both may occur in each unit: (1) artificial substrates; and (2) ''managed areas.'' Artificial substrates include any human-made structure, regardless of age or level of active management. Examples include, but are not limited to, fixed and floating structures, such as: Jetties, groins, breakwaters, fixed or floating AToNs, seawalls, wharves, boat ramps, fishpond walls, pipes, wrecks, mooring balls, docks, aquaculture cages, and other artificial substrates. Managed areas are areas where the substrate has been disturbed by management and will continue to be periodically disturbed by such management. Examples include, but are not limited to, dredged navigation channels, shipping basins, vessel berths, and AToN chain scour areas around anchor blocks. As noted previously, protecting artificial substrates and managed areas would not facilitate meeting our conservation goal of maintaining functional natural reef ecosystems on which the listed species depend. They do not provide stable natural environments for coral growth and settlement and therefore are not necessary for the conservation of the species.

NMFS is aware that dredging may result in sedimentation impacts beyond the actual dredge channel. To the extent that these impacts are persistent, are expected to recur whenever the channel is dredged and are of such a level that the areas in question have already been made unsuitable for coral, then NMFS expects that the federal action agency can assess and identify such areas during their pre-dredging planning and provide their rationale and information supporting this conclusion. To the extent that the federal action agency does so, NMFS proposes that these persistently impacted areas be considered part of the managed areas and excluded from critical habitat.

The application of the 3-step process to each of the 19 specific areas is described in more detail in the Draft Information Report. The resulting delineations of the specific areas are described in Appendix A of the report, and 17 of the 19 are described and shown in the maps at the end of this rule. The entireties of the other two specific areas (Wake and FDM) were determined to be ineligible by the 4(a)(3) analyses summarized below, and described and shown in the Draft Information Report (NMFS, 2019). These are the 19 specific areas to which the ESA section 4(a)(3) and 4(b)(2) analyses were applied. The essential feature is unevenly distributed throughout these 19 specific areas. Within these areas there exists a mosaic of habitats at relatively small spatial scales, some of which naturally contain the essential feature and some that do not. Further, within these large areas, specific managed areas as described previously also exist. If a location within one of these areas does not meet the definition of critical habitat (such as an area of soft substrate or a continuously managed area), it is not included in the designations. Due to the spatial scale at which the essential feature exists interspersed with these other habitats and disturbed areas, and the fact that the precise locations of the essential feature change over time (*e.g.,* seasonally, in response to storms, etc.), we are not able to more finely delineate the essential feature.

Unoccupied Critical Habitat Areas

We have not identified any unoccupied areas for designation of critical habitat. ESA section 3(5)(A)(ii) defines critical habitat to include specific areas outside the geographical area occupied by the species at the time of listing if the areas are determined by the Secretary to be essential for the conservation of the species. Regulations at 50 CFR 424.12(b)(2) specify that we will identify, at a scale determined to be appropriate, specific areas outside the geographical area occupied by the species that are essential for its conservation, considering the life history, status, and conservation needs of the species based on the best available scientific data.

The threats to these seven corals include ocean warming, ocean acidification, and other threats that are primarily caused by global climate change (Brainard *et al.,* 2011). We issued guidance in June 2016 on the treatment of climate change uncertainty in ESA decisions, which addresses critical habitat specifically (NMFS 2016). The guidance states that, when designating critical habitat, NMFS will consider proactive designation of unoccupied habitat as critical habitat when there is adequate data to support a reasonable inference that the habitat is essential for the conservation of the species because of the function(s) it is likely to serve as climate changes.

All seven of these species occur in the Coral Triangle, an area predicted to have rapid and severe impacts from climate change. As a response to changing conditions, these species may shift into previously unoccupied habitats as they become more suitable and as other parts of their range become less suitable in the future. However, the best information available currently does not support a reasonable inference that listed Indo-Pacific corals may expand into unoccupied areas within U.S. waters in the future due to changing climate conditions. In addition, coral reef areas within U.S. jurisdiction provide no more than about 2 percent of each listed species' total range. Without further information, we cannot support the notion that such a small area of unoccupied habitat at the range margin is essential to the conservation of the species.

Application of ESA Section 4(a)(3)(B)(i) (Military Lands)

Section 4(a)(3)(B)(i) of the ESA prohibits designating as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense (DoD), or designated for its use, that are subject to an Integrated Natural Resources Management Plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary of Commerce determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.

Two INRMPs are applicable to proposed coral critical habitat: (1) The Navy's Joint Region Marianas INRMP (JRM INRMP), finalized and signed in 2019 (DoN, 2019); and (2) the Air Force's INRMP for Wake Island Air Field, Wake Atoll, Kokee Air Force Station, Kauai, Hawaii, and Mt. Kaala Air Force Station, Oahu, Hawaii (Wake INRMP), finalized and signed in 2017 (USAF, 2017). The JRM INRMP is a composite of management plans for many distinct DoD controlled areas in the Mariana Islands, including in Guam and CNMI (DoN, 2019).

Summaries of the analyses of whether these two INRMPs are likely to benefit the ESA-listed corals or their habitat in Guam and CNMI (JRM INRMP) and Wake (Wake INRMP) are provided below, following the four considerations outlined in the 2016 guidance for the 4(a)(3) and 4(b)(2) portions of critical habitat designations (81 FR 7413; February 11, 2016). These four considerations are: (1) The extent of the area and essential feature present in the area; (2) The type and frequency of use of the area by the listed species; (3) The relevant elements of the INRMP in terms of management objectives, activities covered, and best management practices, and the certainty that the relevant elements will be implemented; and (4) The degree to which the relevant elements of the INRMP will protect the habitat (essential feature) from the types of effects that would be addressed through a destruction-or-adverse-modification analysis.

JRM INRMP—Guam

In Guam, the JRM INRMP encompasses three marine areas that overlap with areas proposed for coral critical habitat (hereafter ''INRMP marine areas''): (1) Naval Base Guam—Main Base (NBG Main Base) Submerged Lands; (2) Naval Base Guam—Telecommunications Site (NBG TS) Submerged Lands; and (3) Andersen Air Force Base (AAFB) Submerged Lands. A summary of the analyses of whether the INRMP is likely to benefit the habitat of ESA-listed corals in each of these three INRMP marine areas is provided below, summarized from the full analyses in the Draft Information Report (NMFS, 2019).

With regard to the extent of the area and essential feature present: (1) The NBG Main Base Submerged Lands cover approximately 30,000 acres along the coastline from Orote Peninsula to Asan (described in the JRM INRMP, Section 5.3, DoN, 2019); (2) the NBG TS Submerged Lands cover approximately 19,500 acres on the northwestern side of Guam (described in the JRM INRMP, Section 8.3, DoN, 2019); and (3) AAFB Submerged Lands cover approximately 26,500 acres of Submerged Lands on the northern side of Guam (described in the JRM INRMP, Section 9.3, DoN, 2019). Each of the three INRMP marine areas includes extensive potential proposed critical habitat, as shown in Fig. 21 in the Draft Information Report (NMFS, 2019). Most or all of the potential proposed critical habitat within the three INRMP marine areas includes both the substrate and water quality components of the essential feature of coral critical habitat (*i.e.,* characteristics of substrate and water quality support coral life history, including reproduction, recruitment, growth, and maturation), based on information provided previously in the Guam section of the Draft Information Report (NMFS, 2019), the Guam chapter of PIFSC's coral reef monitoring report for the Mariana archipelago (Brainard *et al.,* 2012), and the INRMP (DoN, 2019).

With regard to use of the area by the listed species, the listed coral *Acropora globiceps* occurs within each of the three INRMP marine areas. Two other listed coral species, *Acropora retusa* and *Seriatopora aculeata,* have been recorded on Guam at one or two sites, and thus may also occur in one or more of the three INRMP marine areas (DoN, 2019).

With regard to the relevant elements of the INRMP, and certainty that the relevant elements will be implemented, the two parts of this step are addressed separately below. The relevant elements of the JRM INRMP for each INRMP marine area include: (1) For the NBG Main Base Submerged Lands, the INRMP includes a Coral Habitat Enhancement plan (Section 5.4.2.1), consisting of eight specific actions in three categories: (1) Monitoring and adaptive management (3 actions), (2) collaboration with local partners (3 actions), and (3) reduction of vessel impacts (2 actions); (2) for NBG TS Submerged Lands, the INRMP includes a Coral Habitat Enhancement plan (Section 8.4.2.1), consisting of a similar set of eight specific actions as for NBG Main Base; and (3) for AAFB Submerged Lands, the INRMP includes a Coral Habitat Enhancement plan (Section 9.4.2.1), consisting of a similar set of seven specific actions as for NBG Main Base, except that there is less focus on reduction in vessel impacts because of the much lower vessel traffic there.

NMFS concludes that the Navy will implement the relevant elements of the JRM INRMP for the previously described three INRMP marine areas for three reasons:

(1) Clear and Recent Documentation—the 2019 JRM INRMP includes Coral Habitat Enhancement plans for INRMP marine areas in Guam, with clear strategies and actions that address the habitat conservation needs of ESA-listed corals within these areas. The JRM INRMP's Appendix D also includes annual reports describing how coral conservation efforts have been implemented in recent years. These new coral habitat conservation plans, as well as reports from recent years, clearly articulate how Navy is conserving coral habitat within the INRMP marine areas in Guam, and how it will do so in the future.

(2) Demonstration of Good Faith Efforts for Listed Corals—the Navy has already implemented coral habitat conservation projects that are beneficial to ESA-listed corals within some INRMP marine areas in Guam, as described in the INRMP annual reports in the JRM INRMP's Appendix D (DoN, 2019a), and listed in the Draft Information Report. Many of these projects have been ongoing for several years and are proactive, in that they were not required of the Navy by the ESA. For example, in Fiscal Year 2018 (Oct-18 to Sep-19, FY18), the following coral habitat conservation projects were carried out by the Navy within these waters: (1) 20 mooring buoys were installed within NBG Main Base submerged waters to prevent anchoring on its coral reefs; (2) monitoring of the impacts of coral bleaching and crown of thorns starfish on reef-building corals including listed species; (3) coral surveys of Apra Harbor including listed species; (4) translocation of corals from a dredging area within Apra Harbor (no listed corals); (5) water quality monitoring; and (6) environmental education and outreach (DoN, 2019a, Appendix D, FY18 Annual Report). Many of these projects have been ongoing for several years and are proactive, in that they were not required of the Navy by the ESA.

(3) History of Strong Conservation Work—the Navy has a long history of carrying out successful marine habitat conservation work on Guam, and often takes the initiative on conservation efforts whether requested by NMFS or FWS or not. For example, many of the coral habitat conservation projects in the 2019 JRM INRMP had already been started by the Navy before corals were listed in 2014, and were being done to improve conservation of marine resources on the island, regardless of whether they were required by Federal statute or not.

The coral habitat enhancement elements of the JRM INRMP described previously are expected to substantially reduce the types of effects within the three INRMP marine areas in Guam that would be addressed through the destruction-or-adverse-modification analysis. Navy would accomplish this primarily by using the results of its own monitoring program to develop and implement management actions to enhance coral habitat and measures to minimize the impacts of Navy's (and other DoD branches') actions in Guam on coral habitat within the INRMP marine areas, thereby benefiting listed corals and their habitat.

JRM INRMP—CNMI

In CNMI, the JRM INRMP encompasses two marine areas that overlap with areas considered for coral critical habitat: (1) The Tinian Marine Lease Area (Tinian MLA) Submerged Lands; and (2) the Farallon de Medinilla (FDM) Submerged Lands (DoN, 2019). A summary of the analyses of whether the INRMP is likely to benefit the habitat of ESA-listed corals in each of these two INRMP marine areas is provided below, summarized from the full analyses in the Draft Information Report (NMFS, 2019).

With regard to the extent of the area and essential feature present: (1) The Tinian MLA Submerged Lands cover approximately 47,500 acres surrounding the northern portion of Tinian (described in the JRM INRMP, Section 11.3, DoN, 2019); (2) the FDM Submerged Lands consists of approximately 25,000 acres surrounding FDM (described in the JRM INRMP, Section 12.3, DoN, 2019). Most or all of the potential proposed critical habitat within the two INRMP marine areas includes both the substrate and water quality components of the essential feature of coral critical habitat (*i.e.,* characteristics of substrate and water quality support coral life history, including reproduction, recruitment, growth, and maturation), based on information provided in the Tinian and FDM sections of the Draft Information Report (NMFS, 2019), the Tinian and FDM chapters of PIFSC's coral reef monitoring report for the Mariana archipelago (Brainard *et al.* 2012), and the INRMP (DoN, 2019).

With regard to use of the area by the listed species, the listed coral *Acropora globiceps* is distributed widely throughout the Tinian MLA Submerged Lands, and also occurs in the FDM Submerged Lands. One other listed coral species, *Acropora retusa,* has been recorded in the Tinian MLA Submerged Lands, but not in the FDM Submerged Lands. No other listed corals have been reported from either INRMP marine area (DoN, 2019; NMFS, 2019).

With regard to the relevant elements of the INRMP, and certainty that the relevant elements will be implemented, the two parts of this step are addressed separately below. The relevant elements of the JRM INRMP for each INRMP marine area include: (1) For the Tinian MLA Submerged Lands, the INRMP includes a Coral Habitat Enhancement plan, consisting three specific actions to enhance coral habitat by monitoring health and acute impacts (Section 11.4.2.1; DoN, 2019); and (2) for the FDM Submerged Lands, the INRMP includes marine habitat management actions, consisting of surveys and mapping of ESA-listed corals, coral reef, and other marine habitats within the area (Section 12.4.2; DoN, 2019). The INRMP also includes assessment of ESA-listed corals, as required by the 2015 biological opinion on the Navy's Mariana Islands Testing and Training program (Section 12.4.2.2; DoN, 2019).

NMFS concludes that the Navy will implement these relevant elements of the JRM INRMP for three reasons:

(1) Clear and Recent Documentation—the 2019 JRM INRMP includes Coral Habitat Enhancement plans for INRMP marine areas in CNMI (Tinian MLA, FDM Submerged Lands), with clear strategies and actions that address the habitat conservation needs of ESA-listed corals within these areas. The JRM INRMP's Appendix D also includes annual reports describing how coral conservation efforts have been implemented in recent years in INRMP marine areas in CNMI. These new coral habitat conservation plans, as well as reports from recent years, clearly articulate how Navy is conserving coral habitat within the INRMP marine areas in CNMI, and how it will do so in the future.

(2) Demonstration of Good Faith Efforts for Listed Corals—the Navy has already implemented coral projects that have the potential to benefit the habitat of ESA-listed corals within INRMP marina areas in CNMI (Tinian MLA, FDM Submerged Lands). For example, coral species presence and abundance surveys were conducted within the Tinian MLA in 2013 (DoN, 2014) and 2017 (DoN, 2017), and around FDM in 2012 (Smith and Marx, 2016) and 2017 (Carilli *et al.,* 2018). These surveys were not required by the ESA, and have the potential to benefit the habitat of ESA-

listed corals by providing information needed to better protect these areas in the future.

(3) History of Strong Conservation Work—the Navy has a long history of carrying out successful marine habitat conservation work in the Mariana Islands, and often takes the initiative on conservation efforts whether requested by NMFS or FWS or not. For example, many of the coral habitat conservation projects in the 2019 JRM INRMP had already been started by the Navy before corals were listed in 2014, and were being done to improve conservation of marine resources on the island, regardless of whether they were required by Federal statute or not. While the great majority of these projects have been implemented in Guam rather than CNMI, the JRM INRMP includes many plans for CNMI (as noted previously), and the same Navy office (Navy Facilities Marianas) is responsible for carrying out such work in both Guam and CNMI.

The coral habitat enhancement elements of the JRM INRMP described previously are expected to substantially reduce the types of effects within the two INRMP marine areas in CNMI that would be addressed through the destruction-or-adverse-modification analysis. Navy would accomplish this primarily by using the results of its own monitoring program to develop and implement management measures to minimize the impacts of Navy's (and other DoD branches') actions in CNMI on coral habitat within the INRMP marine areas, thereby benefiting listed corals and their habitat.

Wake INRMP

On Wake Atoll, the Wake INRMP (USAF, 2017) encompasses the entire area considered for coral critical habitat, as described and shown in the Draft Information Report (NMFS, 2019). A summary of the analyses of whether the INRMP is likely to benefit the habitat of ESA-listed corals in this INRMP marine area is provided below, summarized from the full analyses in the Draft Information Report (NMFS, 2019).

With regard to the extent of the area and essential feature present, the Wake INRMP marine area includes nearly 500,000 acres of Submerged Lands and waters within the lagoon and surrounding the atoll out to 12 nautical miles from the mean low water line (USAF 2017), and thus includes all reef-building corals and coral reefs associated with the atoll. Most or all of the potential proposed critical habitat within the INRMP marine area includes both the substrate and water quality components of the essential feature of coral critical habitat (*i.e.,* characteristics of substrate and water quality support coral life history, including reproduction, recruitment, growth, and maturation), based on information provided in the Wake section of the Draft Information Report (NMFS, 2019) and the INRMP (USAF, 2017).

With regard to use of the area by the listed species, the USFWS coral survey at Wake Atoll in August 2016 recorded colonies of both *Acropora globiceps* and *A. retusa* on the south side of Wake in the vicinity of the three sites (USFWS, 2017; USAF, 2017). Thus, we assume that at least these two listed species occur throughout much of this INRMP marine area. No other listed corals have been reported from Wake (USAF, 2017; NMFS, 2019).

With regard to the relevant elements of the INRMP, and certainty that the relevant elements will be implemented, the two parts of this step are addressed separately below. The relevant element of the Wake INRMP is the coral conservation component that was added to the INMRP in 2017 (Appendix S, Coral Conservation Actions at Wake Atoll; USAF, 2017), which is made up of four groups of actions, each of which include multiple projects: Water quality improvements (six projects), education and outreach (two projects), fisheries management (four projects), and physical DoD presence on Wake Atoll (three projects; USAF, 2017). The actions and projects are described in detail in the Draft Information Report (NMFS, 2019).

NMFS concludes that the Air Force will implement these relevant elements of the Wake INRMP for three reasons:

(1) Clear and Recent Documentation—the Wake INRMP includes a coral conservation plan (Appendix S) with a 4-pronged strategy (water quality improvement, outreach and education for Wake-based staff, fisheries management, and physical DoD presence on Wake Atoll *i.e.,* restriction of access and overall natural resource management) that comprehensively addresses the conservation needs of ESA-listed corals on Wake Atoll. This new official coral conservation plan clearly articulates how USAF is conserving corals on Wake, and how it will do so in the future.

(2) Demonstration of Good Faith Efforts for Listed Corals: USAF has already implemented projects on Wake for each of its 4-pronged coral conservation strategy, as explained in Appendix S of the Wake INRMP. For water quality improvement, in 2016 USAF began implementation of both the stormwater pollution prevention and invasive plant control projects. For outreach and education, in 2016 USAF revised the Wake Island Dive Club Charter to further reduce the potential impacts of recreational activities on corals. For fisheries management, in 2017 USAF updated its fishing rules, which are part of the Wake Island Operating Guidance (PSRC 2017) to prohibit the use of (1) cast nets on the exterior of the atoll, (2) anchoring on coral reef habitat, and (3) and trolling over coral reef habitat. For physical DoD presence on Wake Atoll, in 2016 USAF funded and provided logistical support for a FWS coral survey that documented two ESA-listed corals on the atoll for the first time.

(3) History of Strong Conservation Work—USAF has a long history of carrying out successful conservation work on Wake, and often takes the initiative on conservation efforts whether requested by NMFS or FWS or not. For example, many of the projects in the new INRMP's coral conservation strategy had already been started by USAF before corals were listed in 2014, and were being done to improve conservation of marine and terrestrial resources on the atoll, regardless of whether they were required by Federal statute or not. Likewise, in 2016, USAF funded and supported the FWS coral survey of the atoll, leading to the discovery of two ESA-listed corals. In addition, USAF has historically been an excellent conservation partner with NMFS and FWS, supporting a wide variety of marine and terrestrial conservation projects, and actively engaging both agencies in the INRMP planning and implementation process.

The coral conservation component of the Wake INRMP (Appendix S, Coral Conservation Actions at Wake Atoll; USAF, 2017) is expected to reduce both direct and indirect impacts to listed corals via minimization or avoidance of recreational impacts (fishing, diving, anchoring), and terrestrial impacts (*i.e.,* run-off from land-based activities; USAF, 2017). Thus, implementation of the Wake INRMP is likely to provide substantial protection to the essential feature of coral critical habitat (reproductive, recruitment, growth, and maturation habitat) within the INRMP marine area from the types of effects that would be addressed through critical habitat consultation, thereby benefiting listed corals and their habitat.

4(a)(3) Conclusion

Based on the analyses summarized previously and provided in the Draft Information Report (NMFS, 2019), implementation of the JRM INRMP (DoN, 2019) and the Wake INRMP (USAF, 2017) both are likely to benefit the habitats of ESA-listed coral species within all INRMP marine areas on Guam, CNMI, and Wake. Thus, the potential proposed coral critical habitat within the INRMP marine areas on Guam, Tinian, FDM, and Wake are ineligible for coral critical habitat. The partial overlap of these INRMP marine areas with potential proposed coral critical habitat are shown in Figures 21 (Guam) and 22 (Tinian) of the Draft Information Report (NMFS, 2019). On FDM and Wake, the INRMP marine areas completely encompass all the potential proposed coral critical habitat, as shown in Figures 11 (FDM) and 19 (Wake) of the Draft Information Report (NMFS, 2019).

Application of ESA Section 4(b)(2)

Section 4(b)(2) of the ESA requires that we consider the economic impact, impact on national security, and any other relevant impact, of designating any particular area as critical habitat. Additionally, the Secretary has the discretion to consider excluding any area from critical habitat if (s)he determines that the benefits of exclusion (that is, avoiding some or all of the impacts that would result from designation) outweigh the benefits of designation based upon the best scientific and commercial data available. The Secretary may not exclude an area from designation if exclusion will result in the extinction of the species. Because the authority to exclude is discretionary, exclusion is not required for any particular area under any circumstances.

The ESA provides the U.S. Fish and Wildlife Service (USFWS) and NMFS (the Services) with broad discretion in how to consider impacts. (See, H.R. Rep. No. 95–1625, at 17, reprinted in 1978 U.S.C.C.A.N. 9453, 9467 (1978). Economics and any other relevant impact shall be considered by the Secretary in setting the limits of critical habitat for such a species. The Secretary is not required to give economics or any other relevant impact predominant consideration in his specification of critical habitat. The consideration and weight given to any particular impact is completely within the Secretary's discretion.). Courts have noted the ESA does not contain requirements for any particular methods or approaches. (See, *e.g., Bldg. Indus. Ass'n of the Bay Area et al.* v. *U.S. Dept. of Commerce et al.,* No. 13–15132 (9th Cir., July 7, 2015), upholding district court's ruling that the ESA does not require the agency to follow a specific methodology when designating critical habitat under section 4(b)(2)). For this proposed rule, we followed the same basic approach to describing and evaluating impacts as we have for several recent critical habitat rulemakings, as informed by our Policy Regarding Implementation of Section 4(b)(2) of the ESA (81 FR 7226, February 11, 2016).

The following sub-sections describe the economic, national security, and other relevant impacts that we projected would result from including the specific areas described previously in these proposed critical habitat designations. We considered these impacts when deciding whether to exercise our discretion to propose excluding particular areas from the designation. Both positive and negative impacts were identified and considered (these terms are used interchangeably with benefits and costs, respectively). Impacts were evaluated in quantitative terms where feasible, but qualitative appraisals were used where that is more appropriate.

The primary impacts of a critical habitat designation result from the ESA section 7(a)(2) requirement that Federal agencies ensure that their actions are not likely to result in the destruction or adverse modification of critical habitat, and that they consult with NMFS in fulfilling this requirement. Determining these impacts is complicated by the fact that section 7(a)(2) also requires that Federal agencies ensure their actions are not likely to jeopardize the species' continued existence. One incremental impact of designation is the extent to which Federal agencies modify their proposed actions to ensure that they are not likely to destroy or adversely modify the critical habitat beyond any modifications they would make because of listing and the jeopardy requirement. When the same modification would be required due to impacts to both the species and critical habitat, the impact of the designation is co-extensive with the ESA listing of the species (*i.e.,* attributable to both the listing of the species and the designation critical habitat). To the extent possible, our analysis identified impacts that were incremental to the proposed designations of critical habitat, meaning those impacts that are over and above impacts attributable to the species' listing or any other existing regulatory protections. Relevant, existing regulatory protections (including the species' listing) are referred to as the ''baseline'' and are also discussed in the following sections.

The following economic and national security impact analyses describe projected future Federal activities that would trigger section 7 consultation requirements because they may affect the essential feature, and consequently may result in economic or national security impacts. Additionally, these analyses describe broad categories of project modifications that may reduce impacts to the essential feature, and state whether the modifications are likely to be solely a result of the critical habitat designation or co-extensive with another regulation, including the ESA listing of the species. These analyses incorporate recent guidance provided in the final rule on 4(b)(2) analyses (81 FR 7413 February 11, 2016).

Economic Impacts

Economic impacts of the critical habitat designations result through implementation of section 7 of the ESA in consultations with Federal agencies to ensure their proposed actions are not likely to destroy or adversely modify critical habitat. These economic impacts may include both administrative and project modification costs. Economic impacts that may be associated with the conservation benefits of the designations are described later.

An economic impact analysis was conducted in 2016 on the proposed coral critical habitat that projected annual economic impacts during the 10-year period 2016–2025, as described in section 5.1 of the Draft Information Report. Due to a large number of uncertainties, low-end and high-end estimates of economic impacts were developed in terms of the incremental cost of implementing coral critical habitat in addition to the cost of section 7 consultations without critical habitat. A key uncertainty in estimating the economic impacts of coral critical habitat is the lack of critical habitat for any marine species in the affected areas, which means that the historic record of section 7 consultations in these areas does not provide a good predictor of either the future number of total consultations, or the proportion of formal vs. informal consultations resulting from coral critical habitat. Consequently, there is a very large difference between the low-end and high-end economic impact estimates. Low-end total incremental costs resulting from the listed corals' critical habitat are estimated at just under $350,000 over ten years, with an annualized cost of approximately $50,000. High-end total incremental costs are estimated at more than $13 million over 10 years, with an annualized cost of approximately $1.9 million, although this number is unrealistic, as explained below (Draft Information Report, section 5.1).

The high-end estimate is 40 times higher than the low-end estimate primarily because of the assumption that critical habitat would result in all future coral consultations being formal, and that the resulting biological opinions would require modifications to all activities that would not be required in the absence of critical habitat. Critical habitat could only have a high-end level of economic impact if (1) all managed areas such as navigation channels, harbors, and marinas are included in critical habitat, as this is where the action areas for most activities requiring consultation would be located; and (2) the action areas contain the essential feature but not the listed corals, so formal consultation would be required solely because of critical habitat. However, managed areas are not included in the proposed critical habitat, as explained in the Specific Areas Containing the Essential Features Within the Geographical Areas Occupied by the Species section (although they were included in the economic impact analysis because that analysis began in 2015 before managed areas were excluded), thereby minimizing incremental impacts. In addition, a comparison of the projected annual Section 7 formal consultations in 2016–2025 vs. the actual formal consultations that occurred in 2016–2019 found that projected consultations were three times higher than actual consultations (NMFS, 2019, section 5.1). Thus, the likely economic impact of coral critical habitat is likely to be much closer to the low-end estimate than the high-end estimate.

Many studies describe the economic benefits of corals and coral reefs, such as fisheries, recreation, protection of coastal areas by reefs, and many others, as described in Appendix B of the Draft Information Report (NMFS, 2019). By furthering the conservation of the habitat of the listed coral species and associated coral reef species, the critical habitat designations has the potential to contribute to such economic benefits. The extent of the potential economic benefits of coral critical habitat depends on the level of additional protection provided. For example, certain activities such as dredging of navigation channels permitted by the U.S. Army Corps of Engineers (USACE) may be subject to project modifications to avoid adverse modification of critical habitat. These modifications would provide better protection of corals and coral reefs that may then provide economic benefits. Although the proportion of USACE-permitted activities that would be subject to modifications ranges from zero (low-end scenario) to approximately 85 percent (high-end scenario), as described previously, we anticipate the actual economic impacts to be much closer to the low-end than the high-end scenario, with corresponding reduction of potential economic benefits. However, we cannot quantify the anticipated level of economic benefits.

National Security Impacts

When a 4(b)(2) exclusion analysis is undertaken, the Secretaries are to determine if the benefits of exclusion outweigh the benefits of inclusion for a particular area. If so, they may exclude that area, unless they determine that the exclusion will result in the extinction of the species concerned. When DoD, DHS, or another Federal agency requests exclusion from critical habitat on the basis of national-security or homeland security impacts, it must provide a reasonably specific justification of an incremental impact on national security that would result from the designation of that specific area as critical habitat. That justification could include demonstration of probable impacts, such as impacts to ongoing border security, patrols and surveillance activities, or a delay in training or facility construction, as a result of compliance with section 7(a)(2) of the Act.

If the agency provides a reasonably specific justification, we will defer to the expert judgment of DoD, DHS, another Federal agency as to: (1) Whether activities on its lands or waters, or its activities on other lands or waters, have national security or homeland security implications; (2) the importance of those implications; and (3) the degree to which the cited implications would be adversely affected in the absence of an exclusion. In that circumstance, in conducting a discretionary 4(b)(2) exclusion analysis, we will give great weight to national-security and homeland-security concerns in analyzing the benefits of exclusion.

Outside of the JRM and Wake INRMP marine areas described in the 4(a)(3) section, four sites were requested for exclusion by DoD or USCG based on national security impacts, one in Guam and three in CNMI: The portion of the Navy's Ritidian Point Surface Danger Zone Complex outside of DoD Submerged Lands on Guam, two USCG anchorages on Tinian, and a system of six Navy anchorage berths on Saipan. For each of these four sites, the impacts to national security of designating the site as critical habitat were weighed against the benefits to the conservation of listed corals of designating the site as critical habitat. If impacts to national security outweigh benefits to conservation of the listed species, the site is excluded from critical habitat. If benefits to the conservation of the listed species outweigh impacts to national security, the site is not excluded from critical habitat. The full analysis of impacts vs. benefits is provided in the Draft Information Report (NMFS, 2019), and summarized below. The decision to exclude any sites from a designation of critical habitat is always at the discretion of NMFS. In no circumstances is an exclusion of any site required by the ESA (81 FR 7226, February 11, 2016).

For the Navy's Ritidian Point Surface Danger Zone complex, we conclude that the impacts to national security of including this area within critical habitat outweigh the conservation benefits of designation, thus we propose to exclude the site from coral critical habitat designation. The full rationale for excluding this site is provided in the Draft Information Report, section 5.2.1. The most important factors supporting this exclusion are that this area is a unique and important place for DoD activities, and the consultation requirements for critical habitat would place new demands on DoD both in terms of the consultation process as well as potential modifications to the DoD activities. The benefits of designating this low-use and remote habitat is reduced somewhat by the protections already afforded to some of the characteristics of the essential feature, and because DoD use of this area is likely to discourage other Federal activities that may otherwise require consultation. While DoD must still ensure that activities in this area are not likely to jeopardize the continued existence of listed corals, the exclusion of this area means DoD will not be required to consult to insure that its activities are not likely to adversely modify habitat or essential features within this area. Based on our best scientific judgment and acknowledging the small size of this area, and other safeguards that are in place (*e.g.,* protections already afforded listed corals under its listing and other regulatory mechanism), we conclude that exclusion of this area will not result in the extinction of the species.

For the USCG's Tinian anchorages (*i.e.,* Explosives Anchorages A and B on Tinian), we conclude that the conservation benefits of designation outweigh the impacts to national security of including this area within critical habitat, and therefore the anchorages are not excluded from coral critical habitat designation. The full rationale for not excluding this site is provided in the Draft Information Report, section 5.2.2. The factors supporting denial of this exclusion request are that: (1) Coral critical habitat would not create a new consultation requirement for USCG at these sites in addition what is already required by the fact that some corals on Tinian are listed as threatened under the ESA; (2) even if coral critical habitat would create a new consultation requirement for USCG at these site, USCG did not provide enough information to demonstrate how national security would be impacted if critical habitat is designated in these areas; (3) the majority of the areas within the Tinian anchorages are already ineligible for critical habitat due to overlap with the Tinian Marine Lease Area, and most of the remaining areas of the two anchorages are shallow nearshore areas that provide no anchorage; (4) the portions of the anchorages that lie outside of the Tinian Marine Lease Area (*i.e.,* those areas that are still eligible for coral critical habitat) have no protection other than EFH; and (5) the portions of the anchorages that lie outside of the Tinian Marine Lease contain high quality coral habitat.

For the six Navy anchorage berths (L–19, L–32, L–44, L–47, L–62, and M–16) within the Saipan Military Prepositioned Squadron Anchorages site, we conclude that the impacts to national security of including these sites within critical habitat outweigh the conservation benefits of designation, and thus the six berths are proposed for exclusion from coral critical habitat designation. The full rationale for proposing to exclude this site is provided in the Draft Information Report, section 5.2.3. The most important factor supporting this exclusion is that coral critical habitat would create a new consultation requirement for the Navy at these sites in addition to what is already required by the fact that some corals on Saipan are listed as threatened under the ESA. The subsequent formal consultation would cause project delays and modifications that would impact the Military Sealift Command's mission, which is to provide logistics support to distant Navy, USMC, Army, and Air Force military forces for a wide range of national security related activities. The circumstances range from a rise in military tensions with other nations to the ability of the U.S. Government to respond to attacks on U.S. forces, the territory and people of the United States, and U.S. allies. The ability of the prepositioning fleet to provide a response to a threat to the U.S. requires quick transport and delivery of weapons, fuel, and supplies to U.S. military forces; thus delays and modifications at this site would result in substantial national security impacts. Conservation benefits of including the site in critical habitat could be substantial because the site has high quality and quantity of the essential feature with high potential to aid in the conservation of listed corals, for which critical habitat consultation could provide significant protection. However, no listed corals have been recorded within any of the six anchorage berths. While DoD must still insure that activities in this area are not likely to jeopardize the continued existence of listed corals, the exclusion of this area means DoD will not be required to consult to insure that its activities are not likely to adversely modify habitat or essential features within this area. Based on our best scientific judgment and acknowledging the small size of this area, and other safeguards that are in place (*e.g.,* protections already afforded listed corals under its listing and other regulatory mechanism), we conclude that exclusion of this area will not result in the extinction of the species.

Other Relevant Impacts

We identified three broad categories of other relevant impacts of this proposed critical habitat: Conservation benefits, both to the species and to society; impacts on governmental or private entities that are implementing existing management plans that provide benefits to the listed species; and educational and awareness benefits.

Conservation Benefits

The primary benefit of critical habitat designation is the contribution to the conservation and recovery of the seven corals. That is, in protecting the features essential to the conservation of the species, critical habitat directly contributes to the conservation and recovery of the species. This analysis contemplates three broad categories of benefits of critical habitat designation:

(1) Increased probability of conservation and recovery of the seven corals: The most direct benefits of the critical habitat designations stem from the enhanced probability of conservation and recovery of the seven corals. From an economics perspective, the appropriate measure of the value of this benefit is people's ''willingness-to-pay'' for the incremental change. While the existing economics literature is insufficient to provide a quantitative estimate of the extent to which people value incremental changes in recovery potential, the literature does provide evidence that people have a positive preference for listed species conservation, even beyond any direct (*e.g.,* recreation, such as viewing the species while snorkeling or diving) or indirect (*e.g.,* reef fishing that is supported by the presence of healthy reef ecosystems) use for the species.

(2) Ecosystem service benefits of coral reef conservation, in general: Overall, coral reef ecosystems, including those comprising populations of the seven corals, provide important ecosystem services of value to individuals, communities, and economies. These include recreational opportunities (and associated tourism spending in the regional economy), habitat and nursery functions for recreationally and commercially valuable fish species, shoreline protection in the form of wave attenuation and reduced beach erosion, and climate stabilization via carbon sequestration. The total annual economic value of coral reefs in U.S. Pacific Islands jurisdictions in 2012 has been summarized as: (1) American Samoa—$12 million/year, (2) Guam—$155 million/year, and (3) CNMI—$72 million/year (Brander and Van Beukering, 2013). Efforts to conserve the seven corals also benefit the broader reef ecosystems, thereby preserving or improving these ecosystem services and values.

Conservation benefits to each coral in all their specific areas are expected to result from the designations. Critical habitat most directly influences the recovery potential of the species and protects coral reef ecosystem services through its implementation under section 7 of the ESA. That is, these benefits stem from the implementation of project modifications undertaken to avoid destruction and adverse modification of critical habitat. Accordingly, critical habitat designation is most likely to generate the benefits discussed in those areas expected to be subject to additional recommendations for project modifications (above and beyond any conservation measures that may be implemented in the baseline due to the listing status of the species or for other reasons). In addition, critical habitat designation may generate ancillary environmental improvements and associated ecosystem service benefits (*i.e.,* to commercial fishing and recreational activities) in areas subject to incremental project modifications. While neither benefit can be directly monetized, existing information on the value of coral reefs provides an indication of the value placed on those ecosystems.

(3) Education and Awareness Benefits that May Result from the Designations: There is the potential for education and awareness benefits arising from the critical habitat designations. This

potential stems from two sources: (1) Entities that engage in section 7 consultation and (2) members of the general public interested in coral conservation. The former potential exists from parties who alter their activities to benefit the species or essential feature because they were made aware of the critical habitat designation through the section 7 consultation process. The latter may engage in similar efforts because they learned of the critical habitat designations through outreach materials. For example, NMFS has been contacted by diver groups in the Florida Keys who are specifically seeking the two ESA-listed Caribbean *Acropora* corals on dives and report those locations to NMFS, thus assisting us in planning and implementing coral conservation and management activities for those listed species. In our experience, designation raises the public's awareness that there are special considerations to be taken within the area.

Similarly, state and local governments may be prompted to enact laws or rules to complement the critical habitat designations and benefit the listed corals. Those laws would likely result in additional impacts of the designations. However, we are unable to quantify the beneficial effects of the awareness gained through, or the secondary impacts from state and local regulations resulting from the critical habitat designation.

Impacts to Governmental and Private Entities With Existing Management Plans Benefitting the Essential Features

Many previous critical habitat impact analyses evaluated the impacts of the designation on relationships with, or the efforts of, private and public entities involved in management or conservation efforts benefiting listed species. These analyses found that the additional regulatory layer of a designation could negatively impact the conservation benefits provided to the listed species by existing or proposed management or conservation plans.

There are a large number of Federal marine protected areas in American Samoa, Guam, CNMI, and the PRIA where coral critical habitat is being considered (Draft Information Report, Appendix B). Impacts of critical habitat designation on the agencies responsible for natural resource management planning of these areas depend on the type and number of Section 7 consultations that may result from the designation in the areas covered by those plans, as well as any potential project modifications recommended by these consultations. Negative impacts to these entities could result if the critical habitat designation interferes with these agencies' ability to provide for the conservation of the species, or otherwise hampers management of these areas. Existing or proposed management plans in the marine protected areas and their associated regulations protect existing coral reef resources, but they may not specifically protect the substrate and water quality feature for purposes of increasing listed coral abundance and eventual recovery.

However, most of these Federal marine protected areas are still developing management plans, especially the larger ones that include the most potential coral critical habitat (*e.g.,* the National Marine Monuments), thus it is not possible to determine at this time if and how they would be subject to Section 7 consultation due to potential effects on coral critical habitat. Therefore, it is not possible to determine at this time if and how the management of Federal marine protected areas in the Pacific Islands would be impacted by coral critical habitat.

Discretionary Exclusions Under Section 4(b)(2)

We are not exercising our discretion to consider exclusions based on economic impacts. As summarized in the Economic Impacts section, low-end total incremental costs resulting from the listed corals' critical habitats are estimated at just under $350,000 over 10 years, with an annualized cost of approximately $50,000. High-end total incremental costs are estimated at more than $13 million over 10 years, with an annualized cost of approximately $1.9 million. However, the likely economic impact of coral critical habitat is likely to be much closer to the low-end estimate than the high-end estimate.

We are proposing to exclude two particular areas from critical habitat on the basis of national security impacts: The Navy's Ritidian Point Surface Danger Zone complex in Guam, and the Navy's six anchorage berths within the Saipan Military Prepositioned Squadron Anchorages. For the Ritidian Point Surface Danger Zone complex, as summarized in the National Security Impacts section, substantial national security impacts would be expected because consultation requirements for critical habitat would place new demands on DoD both in terms of the consultation process as well as potential modifications to the DoD activities. Conservation benefits are expected to be low because very few Federal activities are likely to be proposed within this site. Thus, we conclude that impacts outweigh benefits, and the site is excluded from proposed critical habitat.

For the Saipan anchorage berths, as summarized in the National Security Impacts section, substantial national security impacts would be expected because formal consultation on anchoring would result in delays or changes to critical DoD activities at the site. Conservation benefits are expected to be substantial because the site has high quality and quantity of the essential feature with high potential to aid in the conservation of listed corals, for which critical habitat consultation could provide significant protection. In addition, non-DoD Federal actions may be proposed within the site, and critical habitat would address a unique management challenge for listed corals at the site. However, because of the substantial national security impacts, we conclude that impacts outweigh benefits, thus the site is excluded from proposed critical habitat.

While at this time we are not proposing to exclude the USCG's Tinian anchorages (*i.e.,* Explosives Anchorages A and B on Tinian) due to a lack of information demonstrating how national security would be impacted if critical habitat is designated in these areas. NMFS will take comments on and reconsider its decision as it pertains to this area consistent with the weighing factors, and provide final exclusion determinations for this request in the final rule.

We are not proposing to exclude any particular area based on other relevant impacts. Other relevant impacts include conservation benefits of the designations, both to the species and to society. Because the feature that forms the basis of the critical habitat designations is essential to the conservation of the seven threatened corals, the protection of critical habitat from destruction or adverse modification may at minimum prevent loss of the benefits currently provided by the species and their habitat, and may contribute to an increase in the benefits of these species to society in the future. While we cannot quantify nor monetize the benefits, we believe they are not negligible and would be an incremental benefit of these designations.

Proposed Critical Habitat Designations

Critical habitat must be defined by specific limits using reference points and lines as found on standard topographic maps of the area, and cannot use ephemeral reference points (50 CFR 424.12(c)). When several habitats, each satisfying the requirements for designation as critical habitat, are located in proximity to one another, an inclusive area may be designated as critical habitat (50 CFR 424.12(d)).

The habitat containing the physical or biological feature that is essential to the conservation of the seven threatened Indo-Pacific corals and that may require special management considerations or protection, is marine habitat of particular depths for each species in American Samoa, Guam, CNMI, and PRIA. The boundaries of each of the 19 specific areas that were considered for proposed coral critical habitat were determined by the process described in the Specific Areas section of the Draft Information Report (NMFS, 2019) and summarized previously. Each specific area provides critical habitat for the one to six listed species known to occur in that area (see Table 1). After applying the 4(a)(3) analysis, the entireties of the FDM and Wake Units were found to be ineligible for critical habitat, leaving the 17 specific areas described below. Of those, portions of the Guam and Tinian Units were also found to be ineligible after applying the 4(a)(3) analysis. In addition, after applying the 4(b)(2) analysis, one site in the Guam Unit (the Navy's Ritidian Point Surface Danger Zone complex), and one site in the Saipan Unit (a group of six Navy berths: L–19, L–32, L–44, L–47, L–62, and M–16)) were excluded from critical habitat.

Occupied Critical Habitat Unit Descriptions

The 17 units of proposed coral critical habitat are briefly described below. Detailed descriptions and maps are provided in the regulatory text:

(1) Tutuila and Offshore Banks: All waters from 0–40 m depth around Tutuila and Offshore Banks, except the areas specified in section (d) of the regulatory text below.

(2) Ofu and Olosega: All waters 0–20 m depth around Ofu and Olosega Islands, except the areas specified in section (d) of the regulatory text below.

(3) Ta'u: All waters 0–20 m depth around Ta'u Island, except the areas specified in section (d) of the regulatory text below.

(4) Rose Atoll: All waters 0–20 m depth around Rose Atoll, except the areas specified in section (d) of the regulatory text below.

(5) Guam: All waters from 0–40 m depth around Guam and Offshore Banks, except the areas specified in section (d) of the regulatory text below, and the national security exclusion (Ritidian Point Surface Danger Zone complex) specified in section (e) of the regulatory text below.

(6) Rota: All waters 0–20 m depth around Rota Island, except the areas specified in section (d) of the regulatory text below.

(7) Aguijian: All waters 0–20 m depth around Aguijian Island, except as specified in section (d) of the regulatory text below.

(8) Tinian and Tatsumi Reef: All waters 0–20 m depth around Tinian and Tatsumi Reef, except the areas specified in section (d) of the regulatory text below.

(9) Saipan and Garapan Bank: All waters 0–40 m depth around Saipan and Garapan Bank, except the areas specified in section (d) of the regulatory text below, and the national security exclusion (six Navy berths) specified in section (e) of the regulatory text below.

(10) Anatahan: All waters 0–20 m depth around Anatahan Island, except as specified in section (d) of the regulatory text below.

(11) Pagan: All waters 0–20 m depth around Pagan Island, except as specified in section (d) of the regulatory text below.

(12) Maug Islands and Supply Reef: All waters 0–20 m depth around Maug Islands and Supply Reef, except as specified in section (d) of the regulatory text below.

(13) Howland Island: All waters 0–10 m depth around Howland Island, except as specified in section (d) of the regulatory text below.

(14) Palmyra Atoll: All waters 0–20 m depth around Palmyra Atoll, except the areas specified in section (d) of the regulatory text below.

(15) Kingman Reef: All waters 0–40 m depth around Kingman Reef, except as specified in section (d) of the regulatory text below.

(16) Johnston Atoll: All waters 0–10 m depth around Johnston Atoll, except the areas specified in section (d) of the regulatory text below.

(17) Jarvis Island: All waters 0–10 m depth around Jarvis Island, except as specified in section (d) of the regulatory text below.

Effects of Critical Habitat Designations

Section 7(a)(2) of the ESA requires Federal agencies, including NMFS, to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated critical habitat. When a species is listed or critical habitat is designated, Federal agencies must consult with NMFS on any agency actions to be conducted in an area where the species is present and that may affect the species or its critical habitat. During the consultation, NMFS would evaluate the agency action to determine whether the action may adversely affect listed species or critical habitat and issue its findings in a biological opinion. If NMFS concludes in the biological opinion that the agency action would likely result in the destruction or adverse modification of critical habitat, NMFS would also recommend any reasonable and prudent alternatives to the action. Reasonable and prudent alternatives are defined in 50 CFR 402.02 as alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid the destruction or adverse modification of critical habitat.

Regulations at 50 CFR 402.16 require Federal agencies that have retained discretionary involvement or control over an action, or where such discretionary involvement or control is authorized by law, to reinitiate consultation on previously reviewed actions in instances in which (1) critical habitat is subsequently designated, or (2) new information or changes to the action may result in effects to critical habitat not previously considered in the biological opinion. Consequently, some Federal agencies may request reinitiation of consultation or conference with NMFS on actions for which formal consultation has been completed, if those actions may adversely modify or destroy designated critical habitat or adversely modify or destroy proposed critical habitat, respectively.

Activities subject to the ESA section 7 consultation process include activities on Federal lands or conducted by a Federal agency, and activities requiring a permit from a Federal agency or some other Federal action, including funding. In the marine and aquatic environments, activities subject to the ESA section 7 consultation process include activities in Federal waters and in state waters that (1) have the potential to affect listed species or critical habitat, and (2) are carried out by a Federal agency, need a permit or license from a Federal agency, or receive funding from a Federal agency. ESA section 7 consultation would not be required for Federal actions that do not affect listed species or critical habitat and for actions that are not federally funded, authorized, or carried out.

Activities That May Be Affected

Section 4(b)(8) of the ESA requires that we describe briefly, and evaluate in any proposed or final regulation to designate critical habitat, those activities that may adversely modify such habitat or that may be affected by such designation. As described in our Draft Information Report, a wide variety of Federal activities may require ESA section 7 consultation because they may affect the essential feature of critical habitat. Specific future activities will need to be evaluated with respect to their potential to destroy or adversely modify critical habitat, in addition to their potential to affect and jeopardize the continued existence of listed species. For example, activities may adversely modify the essential feature by removing or altering the substrate or reducing water clarity through turbidity. These activities would require ESA section 7 consultation when they are authorized, funded, or carried out by a Federal agency. Private entities may also be affected by these proposed critical habitat designations if they are undertaking a project that requires a Federal permit or receives Federal funding.

Categories of activities that may be affected by the designations include coastal and in-water construction, channel dredging, beach nourishment and shoreline protection, water quality management, protected area management, fishery management, aquaculture, military activities, shipwreck removal, scientific research and monitoring, and contaminants regulation. Further information is provided in our Draft Information Report (NMFS, 2019). Questions regarding whether specific activities will constitute destruction or adverse modification of critical habitat should be directed to us (see **ADDRESSES** and **FOR FURTHER INFORMATION CONTACT**).

Public Comments Solicited

We request that interested persons submit comments, information, and suggestions concerning this proposed rule during the comment period (see **DATES**). We are soliciting comments or suggestions from the public, other concerned governments and agencies, the scientific community, industry, or any other interested party concerning this proposed rule, including any foreseeable economic, national security, or other relevant impact resulting from the proposed designations. We specifically are seeking comments on: Areas we are proposing for exclusion, including but not limited to the types of areas that qualify as managed area (*e.g.,* areas adjacent to dredged channels, nearshore placement areas); other areas not included and excluded; the identified geographic areas and depths occupied by the species; the physical and biological feature essential to the coral species' conservation and identification; and the Economic Impact Analysis and Initial Regulatory Flexibility Analysis (Appendices B and C of the Draft Information Report; NMFS, 2019) related to the low and high end estimates and any other costs that may be borne by small businesses directly. You may submit your comments and materials concerning this proposal by any one of several methods (see **ADDRESSES**). Copies of the proposed rule and supporting documentation are available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**). We will consider all comments pertaining to this designation received during the comment period in preparing the final rule. Accordingly, the final designation may differ from this proposal.

Information Quality Act and Peer Review

The data and analyses supporting this proposed action have undergone a pre-dissemination review and have been determined to be in compliance with applicable information quality guidelines implementing the Information Quality Act (section 515 of Pub. L. 106–554). On July 1, 1994, a joint USFWS/NMFS policy for peer review was issued stating that the Services would solicit independent peer review to ensure the best biological and commercial data is used in the development of rulemaking actions and recovery plans under the ESA (59 FR 34270). In addition, on December 16, 2004, the Office of Management and Budget (OMB) issued its Final Information Quality Bulletin for Peer Review (Bulletin). The Bulletin was published in the **Federal Register** on January 14, 2005 (70 FR 2664), and went into effect on June 16, 2005. The primary purpose of the Bulletin is to improve the quality and credibility of scientific information disseminated by the Federal government by requiring peer review of ''influential scientific information'' and ''highly influential scientific information'' prior to public dissemination. ''Influential scientific information'' is defined as ''information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions.'' The Bulletin provides agencies broad discretion in determining the appropriate process and level of peer review. Stricter standards were established for the peer review of ''highly influential scientific information,'' defined as information whose ''dissemination could have a potential impact of more than $500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest.''

The information in the Draft Information Report (NMFS, 2019) supporting this proposed critical habitat rule is considered influential scientific information and is subject to peer review. To satisfy our requirements under the OMB Bulletin, we obtained independent peer review of the information used to draft this document and incorporated the peer review comments into this draft prior to dissemination of this proposed rulemaking. For this action, compliance with the OMB Peer Review Bulletin satisfies any peer review requirements under the 1994 joint peer review policy. Comments received from peer reviewers are available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**).

Classification

Takings (Executive Order 12630)

Under E.O. 12630, Federal agencies must consider the effects of their actions on constitutionally protected private property rights and avoid unnecessary takings of property. A taking of property includes actions that result in physical invasion or occupancy of private property, and regulations imposed on private property that substantially affect its value or use. In accordance with E.O. 12630, this proposed rule would not have significant takings implications. A takings implication assessment is not required.

Executive Order 12866, Regulatory Planning and Review, and Executive Order 13771, Reducing Regulation and Controlling Regulatory Costs

This rule has been determined to be significant for purposes of E.O. 12866 review. This proposed rulemaking is expected to be considered ''regulatory'' under E.O. 13771.

Low-end total incremental costs resulting from the listed corals' critical habitat are estimated at just under

$350,000 over ten years, with an annualized cost of approximately $50,000. High-end total incremental costs are estimated at more than $13 million over 10 years, with an annualized cost of approximately $1.9 million (Appendix B of the Draft Information Report; NMFS, 2019). The high-end estimate is 40 times higher than the low-end estimate primarily because of the assumption that critical habitat would result in all future coral consultations being formal, and that the resulting biological opinions would require modifications to all activities that would not be required in the absence of critical habitat. Critical habitat could only have a high-end level of economic impact if (1) all managed areas such as navigation channels, harbors, and marinas are included in critical habitat, as this is where the action areas for most activities requiring consultation would be located; and (2) the action areas contain the essential feature but not the listed corals, so formal consultation would be required solely because of critical habitat. However, managed areas are not included in the proposed critical habitat, as explained in the Specific Areas Containing the Essential Features Within the Geographical Areas Occupied by the Species section, thereby minimizing incremental impacts. In addition, a comparison of the projected annual Section 7 formal consultations in 2016–2025 vs. the actual formal consultations that occurred in 2016–2019 found that projected consultations were three times higher than actual consultations (NMFS, 2019, section 5.1). Thus, the likely economic impact of coral critical habitat is likely to be much closer to the low-end estimate than the high-end estimate.

A Draft Economic Report (Appendix B of the Draft Information Report; NMFS, 2019) and Draft ESA Section 4(b)(2) Report (the 4(b)(2) section of the Draft Information Report; NMFS, 2019) have been prepared to support the exclusion process under section 4(b)(2) of the ESA and our consideration of alternatives to this rulemaking. These supporting documents are available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**).

Federalism (Executive Order 13132)

Pursuant to the Executive Order on Federalism, E.O. 13132, we determined that this proposed rule does not have significant federalism effects and that a federalism assessment is not required. However, in keeping with Department of Commerce policies and consistent with ESA regulations at 50 CFR 424.16(c)(1)(ii), we will request information for this proposed rule from Territorial resource agencies in American Samoa, Guam, and the CNMI. The proposed designations may have some benefit to state and local resource agencies in that the proposed rule more clearly defines the physical and biological feature essential to the conservation of the species and the areas on which that feature is found.

Energy Supply, Distribution, and Use (Executive Order 13211)

Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking an action expected to lead to the promulgation of a final rule or regulation that is a significant regulatory action under E.O. 12866 and is likely to have a significant adverse effect on the supply, distribution, or use of energy. OMB Guidance on Implementing E.O. 13211 (July 13, 2001) states that significant adverse effects could include any of the following outcomes compared to a world without the regulatory action under consideration: (1) Reductions in crude oil supply in excess of 10,000 barrels per day; (2) reductions in fuel production in excess of 4,000 barrels per day; (3) reductions in coal production in excess of 5 million tons per year; (4) reductions in natural gas production in excess of 25 million cubic feet per year; (5) reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity; (6) increases in energy use required by the regulatory action that exceed any of the thresholds previously described; (7) increases in the cost of energy production in excess of one percent; (8) increases in the cost of energy distribution in excess of one percent; or (9) other similarly adverse outcomes. A regulatory action could also have significant adverse effects if it (1) adversely affects in a material way the productivity, competition, or prices in the energy sector; (2) adversely affects in a material way productivity, competition or prices within a region; (3) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency regarding energy; or (4) raises novel legal or policy issues adversely affecting the supply, distribution or use of energy arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866 and 13211.

This rule, if finalized, will not have a significant adverse effect on the supply, distribution, or use of energy. Therefore, we have not prepared a Statement of Energy Effects.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

We prepared an Initial Regulatory Flexibility Analysis (IRFA) pursuant to section 603 of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601, *et seq.*). The IRFA analyzes the impacts to those areas where critical habitat is proposed, and is included as Appendix C of the Draft Information Report (NMFS, 2019), which is available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**). The IRFA is summarized below, as required by section 603 of the RFA. The IRFA describes the economic impact this proposed rule, if adopted, would have on small entities.

Consultations on in-water and coastal construction and dredging and disposal (as determined by the 4(b)(2) economic impact analysis in Appendix B of the draft Information Report) all have the potential to involve third parties, such as recipients of Clean Water Act section 404 permits. These activities were combined into one broad industry category that may experience impacts to small entities: In-Water and Coastal Construction and Dredging. This IRFA relies on the estimated incremental impacts resulting from the proposed critical habitat designation, as described in the 4(b)(2) economic impact analysis in Appendix B of the Draft Information Report (NMFS, 2019). To be consistent with this analysis, the IRFA provides low-end and high-end estimates of the impacts to small entities.

The low-end estimate assumes no incremental project modifications occur because baseline permit conditions and regulations would provide sufficient protection to avoid adverse modification of critical habitat. Impacts to small entities would be due solely to the additional administrative costs of considering the potential for adverse effects to critical habitat during section 7 consultations. In addition, the low-end estimate assumes that trends in the frequency of informal consultations over the next ten years will resemble those of the past ten years. The high-end estimate of the impacts to small entities assumes that there will be incremental project modification costs for future projects related to in-water and coastal construction and dredging and that all projected future actions will require formal consultations (Section 6.0 of Appendix B of Draft Information Report; NMFS, 2019).

For some projects related to in-water and coastal construction and dredging most of the administrative costs and project modification costs will likely either be borne directly by, or passed onto, Federal agencies. However, in order to present a conservative estimate of the impacts to small entities, this IRFA assumes that all administrative and project modification costs are borne by third parties rather than Federal agencies.

The low-end and high-end estimated impacts to small entities are summarized in Tables 1 and 2 in Appendix B of Draft Information Report (NMFS, 2019). Assuming all small entities bear an equal share of costs, the low-end estimated impacts per small entity per year ranges from $2,273 to $2,816, and the high-end estimated impacts per small entity per year ranges from $115,625 to $117,580 in CNMI, Guam, and American Samoa.

The low-end estimate of the total annualized incremental impacts of critical habitat designation to small entities across the three areas is about $39,000. These costs are distributed evenly among the approximate 16 entities expected to be subject to section 7 consultations each year. Per entity annualized impacts of critical habitat designation across the three areas are estimated to make up only 0.05 percent of the average annual revenues for a business engaged in in-water and coastal construction or dredging. The high-end estimate of the annualized impacts to small entities across the three areas is $1,819,000. Per entity annualized impacts of critical habitat designation across the three areas are estimated to make up 2.4 percent of annual revenues for each affected small entity.

The high-end estimate is almost certainly an overstatement of the costs borne by small entities. It is not likely that all projected future actions will require formal consultations, nor is it likely that one small entity would bear all the consultation costs. Moreover, the IRFA conservatively assumes that all administrative and project modification costs are borne by third parties rather than Federal agencies. On other hand, the low-end estimate likely overstates the number of small entities affected and possibly understates the costs borne by these entities. In other words, the scenarios in the IRFA present broad ranges of the number of potentially affected entities and associated revenue effects. The actual number of small entities affected and revenue effects are not expected to fall at either extreme end of the continuum. NMFS seeks comments on its analysis presented in the IRFA related to the low and high end estimates and any other costs that may be borne by small businesses directly.

Coastal Zone Management Act

We have determined that this action will have no reasonably foreseeable effects on the enforceable policies of American Samoa, Guam, and CNMI. Upon publication of this proposed rule, these determinations will be submitted for review by the responsible Territorial agencies under section 307 of the Coastal Zone Management Act [16 U.S.C. 1456].

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This proposed rule does not contain any new or revised collection of information. This rule, if adopted, would not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

This proposed rule will not produce a Federal mandate. The designation of critical habitat does not impose a legally-binding duty on non-Federal government entities or private parties. The only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7 of the ESA. Non-Federal entities which receive Federal funding, assistance, permits or otherwise require approval or authorization from a Federal agency for an action may be indirectly affected by the designation of critical habitat, but the Federal agency has the legally binding duty to avoid destruction or adverse modification of critical habitat.

We do not anticipate that this rule, if finalized, will significantly or uniquely affect small governments. Therefore, a Small Government Action Plan is not required.

Consultation and Coordination With Indian Tribal Governments (Executive Order 13175)

The longstanding and distinctive relationship between the Federal and tribal governments is defined by treaties, statutes, executive orders, judicial decisions, and agreements, which differentiate tribal governments from the other entities that deal with, or are affected by, the Federal Government.

This relationship has given rise to a special Federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and with respect to Indian lands, tribal trust resources, and the exercise of tribal rights. Pursuant to these authorities, lands have been retained by Indian Tribes or have been set aside for tribal use. These lands are managed by Indian Tribes in accordance with tribal goals and objectives within the framework of applicable treaties and laws. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, outlines the responsibilities of the Federal Government in matters affecting tribal interests. The proposed critical habitat designations for threatened Indo-Pacific corals are located in U.S. territories and therefore do not have tribal implications in accordance with Executive Order 13175.

References Cited

A complete list of all references cited in this rulemaking is available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals,* at *www.regulations.gov,* or upon request (see **FOR FURTHER INFORMATION CONTACT**). In addition, pdf copies of all cited documents are available upon request from the NMFS Pacific Islands Regional Office in Honolulu, HI (see **ADDRESSES**).

List of Subjects

50 CFR Part 23

Endangered and threatened species, Exports, Imports, Transportation.

50 CFR Part 226

Endangered and threatened species.

Dated: September 22, 2020.

Samuel D. Rauch III,

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

For the reasons set out in the preamble, we propose to amend 50 CFR parts 223 and 226 as follows:

PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

■ 1. 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).

■ 2. In § 223.102(e), in the table, under the heading ''Corals'' revise the entries for ''*Acropora globiceps*'', ''*Acropora jacquelineae*'', ''*Acropora retusa*'', ''*Acropora speciosa*'', ''*Euphyllia paradivisa*'', ''*Isopora crateriformis*'', and ''*Seriatopora aculeata*''.

§ 223.102 Enumeration of threatened marine and anadromous species.

* * * * *

(e) * * *

Species[1]			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
*	*	*	*	*	*
Corals					
Coral, [no common name]	*Acropora globiceps*	Entire species	79 FR 53852, Sept. 10, 2014.	*226.228*	NA.
Coral, [no common name]	*Acropora jacquelineae*	Entire species	79 FR 53852, Sept. 10, 2014	*226.228*	NA.
*	*	*	*	*	*
Coral, [no common name]	*Acropora retusa*	Entire species	79 FR 53852, Sept. 10, 2014	*226.228*	NA.
Coral, [no common name]	*Acropora speciosa*	Entire species.	79 FR 53852, Sept. 10, 2014	*226.228*	NA.
Coral, [no common name]	*Euphyllia paradivisa*	Entire species	79 FR 53852, Sept. 10, 2014	*226.228*	NA.
Coral, [no common name]	*Isopora crateriformis*	Entire species.	79 FR 53852, Sept. 10, 2014	*226.228*	NA.
*	*	*	*	*	*
Coral, [no common name]	*Seriatopora aculeata*	Entire species	79 FR 53852, Sept. 10, 2014	*226.228*	NA.
*	*	*	*	*	*

[1] 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).

PART 226—DESIGNATED CRITICAL HABITAT

■ 3. The authority citation for part 226 continues to read as follows:

Authority: 16 U.S.C. 1533.

■ 4. Add § 226.228 to read as follows:

§ 226.228 Critical habitat for *Acropora globiceps, Acropora jacquelineae, Acropora retusa, Acropora speciosa, Euphyllia paradivisa, Isopora crateriformis,* and *Seriatopora aculeata.*

Critical habitat is designated in the following jurisdictions for the following species as depicted in the maps below and described in paragraphs (a) through (e) of this section. The maps can be viewed or obtained with greater resolution (available at *https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-threatened-indo-pacific-corals*) to enable a more precise inspection of proposed critical habitat for *A. globiceps, A. jacquelineae, A. retusa, A. speciosa, E. paradivisa, I. crateriformis,* and *S. aculeata.*

(a) *Critical habitat locations.* Critical habitat is designated for the following species in the following jurisdictions:

TABLE 1 TO PARAGRAPH (a)

Species	State—counties (or other jurisdiction)
Acropora globiceps	American Samoa (AS), Guam (Gu), Commonwealth of the Northern Mariana Islands (CNMI), Pacific Remote Island Area (PRIA).
Acropora jacquelineae	AS.
Acropora retusa	AS, Gu, CNMI, PRIA.
Acropora speciosa	AS, PRIA.
Euphyllia paradivisa	AS.
Isopora crateriformis	AS.
Seriatopora aculeata	Gu, CNMI.

(b) *Critical habitat boundaries.* Except as noted in paragraphs (d) and (e) of this section, critical habitat for the seven species in the 17 units includes the following areas:

(1) Tutuila and Offshore Banks: All waters from 0–40 m depth around Tutuila and Offshore Banks, except the areas specified in paragraph (d) of this section.

(2) Ofu and Olosega: All waters 0–20 m depth around Ofu and Olosega Islands, except the areas specified in paragraph (d) of this section.

(3) Ta‘u: All waters 0–20 m depth around Ta‘u Island, except the areas specified in paragraph (d) of this section.

(4) Rose Atoll: All waters 0–20 m depth around Rose Atoll, except the areas specified in paragraph (d) of this section.

(5) Guam: All waters from 0–40 m depth around Guam and Offshore Banks, except the areas specified in paragraph (d) of this section, and the national security exclusion (the Navy's Ritidian Point Surface Danger Zone complex) specified in paragraph (e) of this section.

(6) Rota: All waters 0–20 m depth around Rota Island, except the areas specified in paragraph (d) of this section.

(7) Aguijian: All waters 0–20 m depth around Aguijian Island, except as specified in paragraph (d) of this section.

(8) Tinian and Tatsumi Reef: All waters 0–20 m depth around Tinian and Tatsumi Reef, except the areas specified in paragraph (d) of this section.

(9) Saipan and Garapan Bank: All waters 0–40 m depth around Saipan and Garapan Bank, except the areas specified in paragraph (d) of this section, and the national security exclusion (six Navy berths) specified in paragraph (e) of this section.

(10) Anatahan: All waters 0–20 m depth around Anatahan Island, except as specified in paragraph (d) of this section.

(11) Pagan: All waters 0–20 m depth around Pagan Island, except as specified in paragraph (d) of this section.

(12) Maug Islands and Supply Reef: All waters 0–20 m depth around Maug Islands and Supply Reef, except as specified in paragraph (d) of this section.

(13) Howland Island: All waters 0–10 m depth around Howland Island, except as specified in paragraph (d) of this section.

(14) Palmyra Atoll: All waters 0–20 m depth around Palmyra Atoll, except the areas specified in paragraph (d) of this section.

(15) Kingman Reef: All waters 0–40 m depth around Kingman Reef, except as specified in paragraph (d) of this section.

(16) Johnston Atoll: All waters 0–10 m depth around Johnston Atoll, except the areas specified in paragraph (d) of this section.

(17) Jarvis Island: All waters 0–10 m depth around Jarvis Island, except as specified in paragraph (d) of this section.

(18) Maps of the 17 units where critical habitat is proposed are provided below (all of Wake Atoll and Farallon de Medinilla are ineligible for critical habitat because of 4(a)(3)).

(c) *Essential feature.* The feature essential to the conservation of *A. globiceps, A. jacquelineae, A. retusa, A. speciosa, E. paradivisa, I. crateriformis,* and *S. aculeata* is: Reproductive, recruitment, growth, and maturation habitat. Sites that support the normal function of all life stages of the corals are natural, consolidated hard substrate or dead coral skeleton free of algae and sediment at the appropriate scale at the point of larval settlement or fragment reattachment, and the associated water column. Several attributes of these sites determine the quality of the area and influence the value of the associated feature to the conservation of the species:

(1) Substrate with presence of crevices and holes that provide cryptic habitat, the presence of microbial biofilms, or presence of crustose coralline algae;

(2) Reefscape with no more than a thin veneer of sediment and low occupancy by fleshy and turf macroalgae;

(3) Marine water with levels of temperature, aragonite saturation, nutrients, and water clarity that have been observed to support any demographic function; and

(4) Marine water with levels of anthropogenically-introduced (from humans) chemical contaminants that do not preclude or inhibit any demographic function.

(d) *Areas not included in critical habitat.* Critical habitat does not include the following particular areas where they overlap with the areas described in paragraphs (a) through (c) of this section:

(1) Pursuant to ESA section 4(a)(3)(B), all areas subject to the 2017 Wake Island and 2019 Joint Region Marianas Integrated Natural Resources Management Plans.

(2) Pursuant to ESA section 3(5)(A)(i)(I), areas where the essential feature does not occur;

(3) Pursuant to ESA section 3(5)(A)(i)(I), all managed areas that may contain natural hard substrate but do not provide the quality of substrate essential for the conservation of threatened corals. Managed areas that do not provide the quality of substrate essential for the conservation of the seven Indo-Pacific corals are defined as particular areas whose consistently disturbed nature renders them poor habitat for coral growth and survival over time. These managed areas include specific areas where the substrate has been disturbed by planned management authorized by local, territorial, state, or Federal governmental entities at the time of critical habitat designation, and will continue to be periodically disturbed by such management. Examples include, but are not necessarily limited to, dredged navigation channels, shipping basins, vessel berths, and active anchorages;

(4) Pursuant to ESA section 3(5)(A)(i), artificial substrates including but not limited to: Fixed and floating structures, such as aids-to-navigation (AToNs), seawalls, wharves, boat ramps, fishpond walls, pipes, submarine cables, wrecks, mooring balls, docks, aquaculture cages;

(5) Areas not included in critical habitat on Tutuila.

(i) Critical habitat does not include two areas where the essential feature does not occur: Inner Pago Pago Harbor: West of line between Nuutatai Point (−14.276621, −170.680441) and Trading Point (−14.270756, −170.684961) on Map 10 of NOAA Chart 83484; and Pala Lagoon: West of line between Coconut Point (−14.322021, −170.702835) and the airport tarmac (−14.324714, −170.699535).

(ii) Critical habitat does not include managed areas, including but not limited to: USACE-managed small boat harbors, basins, and navigation channels (areas within ''Federal Project Limits'' indicated in Hydrographic Surveys for Aunu'u and Auasi Small Boat Harbors on USACE Honolulu District Civil Works' website); the seawall breakwaters, and areas lying between the ''Federal Project Limits'' and seawall breakwaters; all other harbors, navigation channels, turning basins, and berthing areas that are periodically dredged or maintained; all seawall breakwaters, areas lying between the managed areas and seawall breakwaters, and a 25 m radius of substrate around each of the AToN bases.

(iii) Critical habitat does not include artificial substrates, including but not limited to: The 11 USCG-managed fixed and floating AToNs, USACE-managed seawalls (Afono, Aoa, Lepua, Masefau, Matafao, Paloa, Vatia, Pago Pago to Nuuuli, and Pago Pago Airport Shore Protection and Beach Erosion Control Projects, as described on USACE Honolulu District Civil Works' website); and all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(6) Areas not included in critical habitat on Ofu and Oloseg.

(i) Critical habitat does not include managed areas, including but not limited to: The USACE-managed Ofu Small Boat Harbor and navigation channel (areas within ''Federal Project Limits'' indicated in Hydrographic Surveys for the Ofu Small Boat Harbor on USACE Honolulu District Civil Works' website); the seawall breakwaters, areas lying between the Federal Project Limits and seawall breakwaters, and a 25 m radius of substrate around each of the AToN bases.

(ii) Critical habitat does not include artificial substrates, including but not limited to: The two USCG-managed fixed and floating AToNs, USACE-managed Ofu Airstrip Shore Protection Project, as described on USACE Honolulu District Civil Works' website; and all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(7) Areas not included in critical habitat on Ta'u.

(i) Critical habitat does not include managed areas, including but not limited to: The USACE-managed Ta'u Small Boat Harbor and navigation channel (areas within ''Federal Project Limits'' indicated in Hydrographic Surveys for Ta'u Small Boat Harbor on USACE Honolulu District Civil Works' website); the seawall breakwaters, areas lying between the Federal Project Limits and seawall breakwaters, and a 25 m radius of substrate around each of the AToN bases.

(ii) Critical habitat does not include artificial substrates including but not limited to: The four USCG-managed fixed and floating AToNs, all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(8) Areas not included in critical habitat on Rose Atoll.

(i) Critical habitat does not include the lagoon because it lacks the essential feature.

(ii) Critical habitat does not include any managed areas or artificial substrates.

(9) Areas not included in critical habitat on Guam.

(i) Critical habitat does not include three INRMP marine areas:

(A) NBG Main Base Submerged Lands;

(B) NBG TS Submerged Lands; and

(C) AAFB Submerged Lands.

(ii) Critical habitat does not include managed areas, including but not limited to: The Guam Port Authority harbors, basins, and navigation channels; Navy-managed Apra Harbor basins, and navigation channels, and the seawall breakwaters; USACE-managed small boat harbors, basins, and navigation channels (areas within ''Federal Project Limits'' indicated in Hydrographic Surveys for Agat and Agana Small Boat Harbors on USACE Honolulu District Civil Works' website); the seawall breakwaters, and areas lying between the Federal Project Limits and seawall breakwaters; all other channels, turning basins, and berthing areas that are periodically dredged or maintained, and 25 m radius of substrate around each of the AToN bases.

(iii) Critical habitat does not include artificial substrates, including but not limited to: The USCG-managed 32 fixed and floating AToNs; USACE-managed seawalls (Asquiroga Bay Shoreline Protection Project and marine components of the Namo River Flood Control project, as described on USACE Honolulu District Civil Works' website); Territory-managed boat ramps, including at Agana, Merizo, Seaplane Ramp in Apra Harbor, Umatac, and Agat; all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(10) Areas not included in critical habitat on Rota.

(i) Critical habitat does not include managed areas, including but not limited to: The USACE-managed Rota Harbor and navigation channel (areas within ''Federal Project Limits'' indicated in Hydrographic Surveys for the Rota Harbor on USACE Honolulu District Civil Works' website); the seawall breakwaters, areas lying between the Federal Project Limits and seawall breakwaters, and a 25 m radius of substrate around each of the AToN bases.

(ii) Critical habitat does not include artificial substrates, including but not limited to: The two USCG-managed fixed AToNs; the Territory-managed boat ramp at Rota Harbor; all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(11) Critical habitat does not include any managed areas or artificial substrates on Aguijian.

(12) Areas not included in critical habitat on Tinian and Tatsumi Reef.

(i) Critical habitat does not include the Tinian MLA Submerged Lands.

(ii) Critical habitat does not include managed areas, including but not limited to: Tinian Harbor and navigation channel as shown on NOAA Navigation Chart 81067, the seawall breakwater, and a 25 m radius of substrate around each of the AToN bases.

(iii) Critical habitat does not include artificial substrates, including but not limited to: The six USCG-managed fixed AToNs, the Territory-managed boat ramp at Tinian Harbor, all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(13) Areas not included in critical habitat on Saipan and Garapan Bank.

(i) Critical habitat does not include the Commonwealth Ports Authority harbors, basins, and navigation channels, their seawall breakwaters; all other channels, turning basins, berthing areas that are periodically dredged or maintained, and a 25 m radius of substrate around each of the AToN bases.

(ii) Critical habitat does not include artificial substrates, including but not limited to: The 15 USCG-managed fixed AToNs, Territory-managed boat ramps at Smiling Cove (Garapan), Sugar Dock (Chalan Kanoa), Tanapag, Fishing Base (Garapan), and Lower Base (Tanapag); and all other AToNs, seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(14) Critical habitat does not include any managed areas or artificial substrates on Anatahan, Pagan, Maug Islands and Supply Reef, or Howland Island.

(18) Areas not included in critical habitat on Palmyra Atoll.

(i) Critical habitat does not include managed areas, including but not limited to: The main channel into the lagoon, dredged area in the central lagoon, and other channels and areas that are periodically dredged or maintained.

(ii) Critical habitat does not include artificial substrates, including but not limited to: Seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other artificial structures.

(16) Critical habitat does not include any managed areas or artificial substrates on Kingman Reef.

(17) Areas not included in critical habitat on Johnston Atoll.

(i) Critical habitat does not include managed areas, including but not limited to: The main channel around Johnston Island, and other dredged channels and areas.

(ii) Critical habitat does not include artificial substrates, including but not limited to: Seawalls, wharves, docks, boat ramps, moorings, pipes, wrecks, and other structures.

(18) Critical habitat does not include managed areas or artificial substrates Jarvis Island.

(e) *Areas excluded from critical habitat.* Pursuant to ESA section 4(b)(2), the following areas are excluded from critical habitat:

(1) On Guam, the marine component of the Navy's complex of overlying Surface Danger Zones off of Ritidian Point, delineated from point 144°51′18″ W, 13°39′5″ S on the shoreline to point 144°51′27″ W, 13°39′34″ S at 40 m depth, then along the 40 m depth contour to point 144°53′1″ W, 13°39′8″ S, then to point 144°52′49″ W, 13°38′38″ S on the shoreline, then along the shoreline back to the original point of 144°51′18″ W, 13°39′5″ S on the shoreline.

(2) On Saipan, Naval anchorage berths off the west coast known as L–62 (circle with radius approximately 366 m around center point 15°11′4.9194″ N 145°39′41.7594″ E), L–32 (circle with radius approximately 366 m around center point 15°12′13.6794″ N 145°41′33.3594″ E), L–44 (circle with radius approximately 366 m around center point 15°11′40.1994″ N 145°40′37.5594″ E), L–47 (circle with radius approximately 366 m around center point 15°11′27.2394″ N 145°41′30.1194″ E), L–19 (circle with radius approximately 366 m around center point 15°12′53.64″ N 145°40′53.3994″ E), and M–16 (circle with radius approximately 488 m around center point 15°12′36″ N 145°39′34.9194″ E).

(f) *Critical habitat maps.* Maps of the 17 units of proposed Indo-Pacific coral critical habitat.

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Figure 1 to paragraph (f) – Tutuila and Offshore Banks.

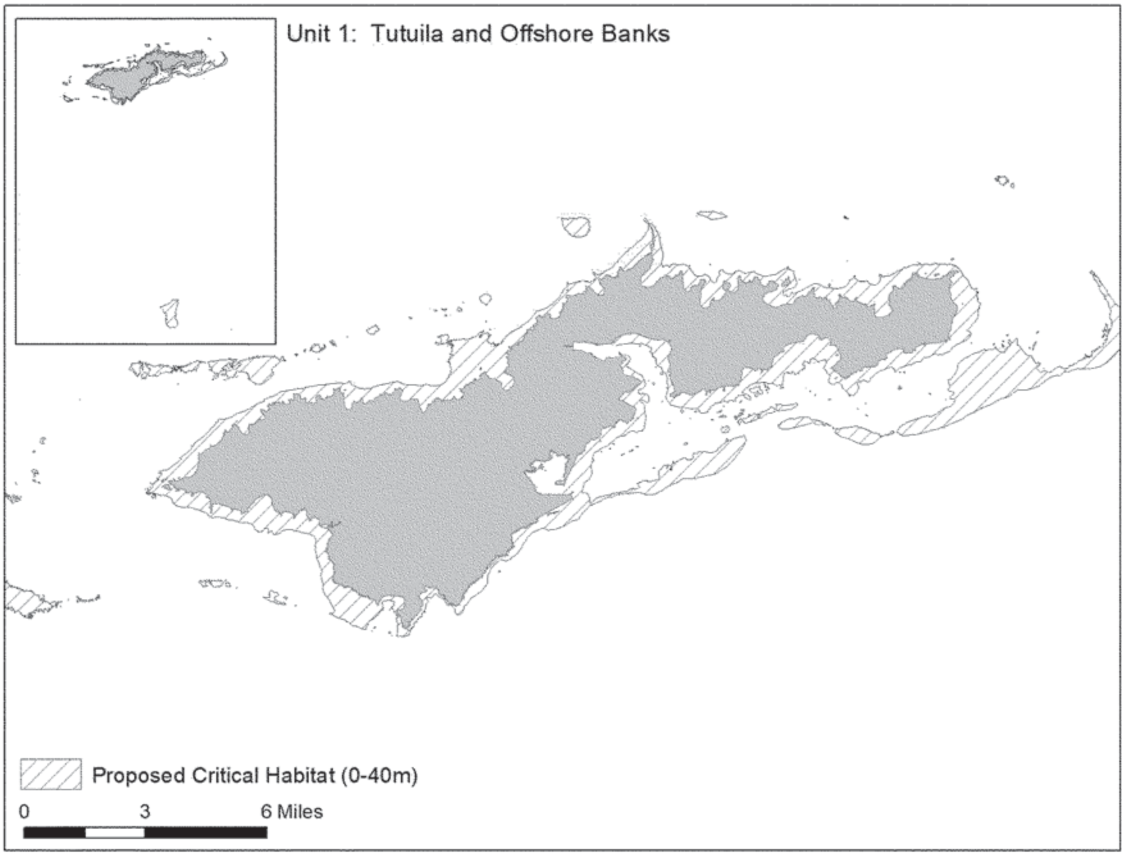

Figure 2 to paragraph (f) – Ofu and Olosega

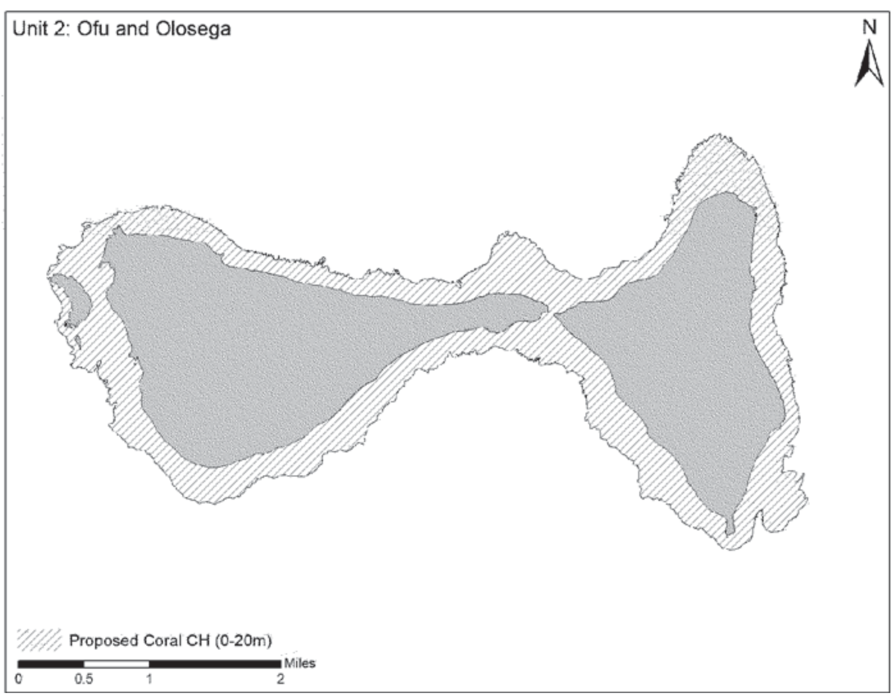

Figure 3 to paragraph (f) – Ta`u

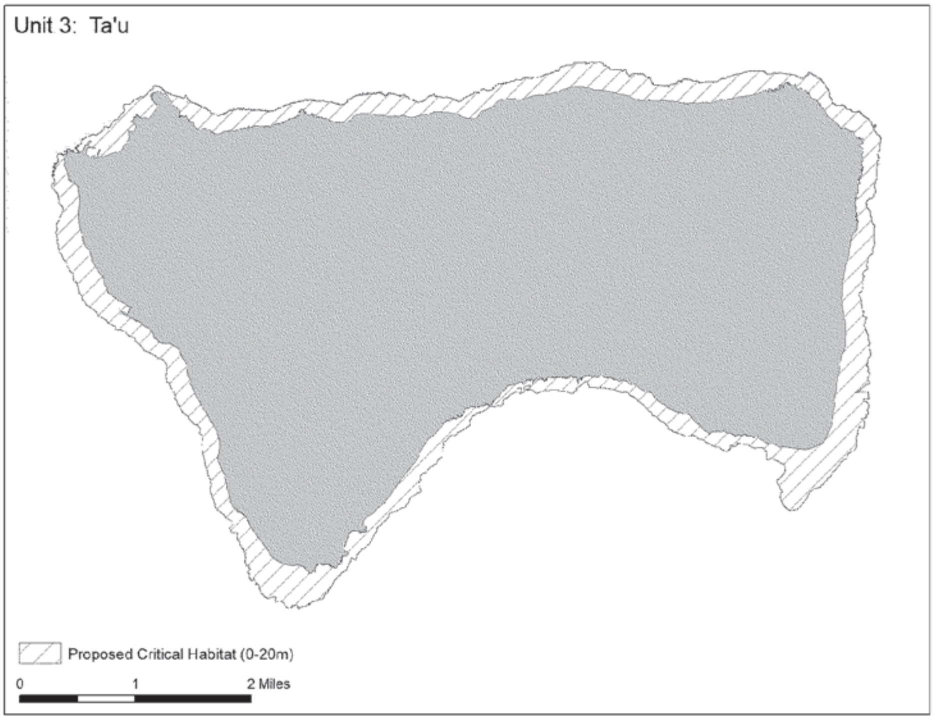

Figure 4 to paragraph (f) – Rose Atoll

Figure 5 to paragraph (f) – Guam

Figure 6 to paragraph (f) – Rota

Figure 7 to paragraph (f) – Aguijan

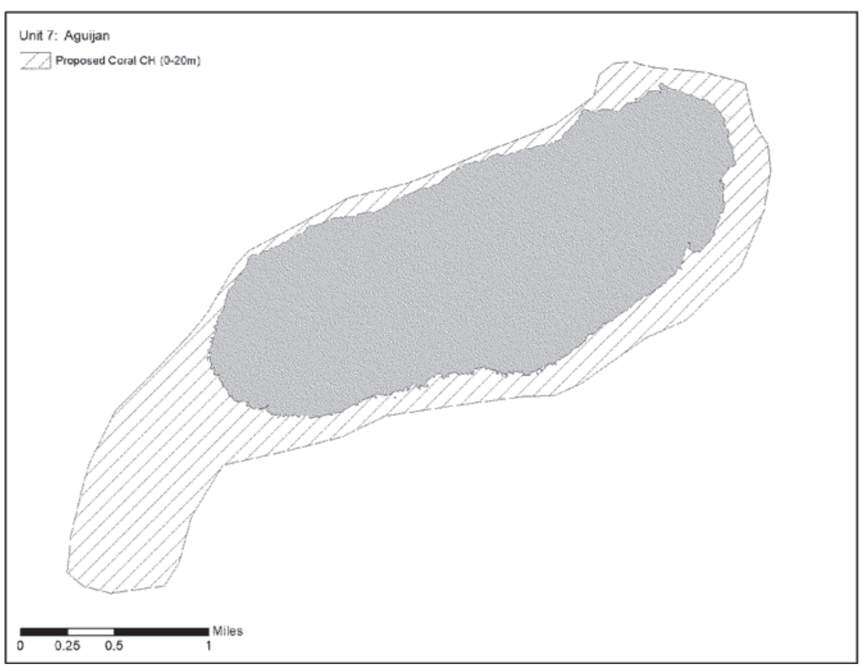

Figure 8 to paragraph (f) – Tinian and Tatsumi Reef

Figure 9 to paragraph (f) – Saipan and Garapan Bank

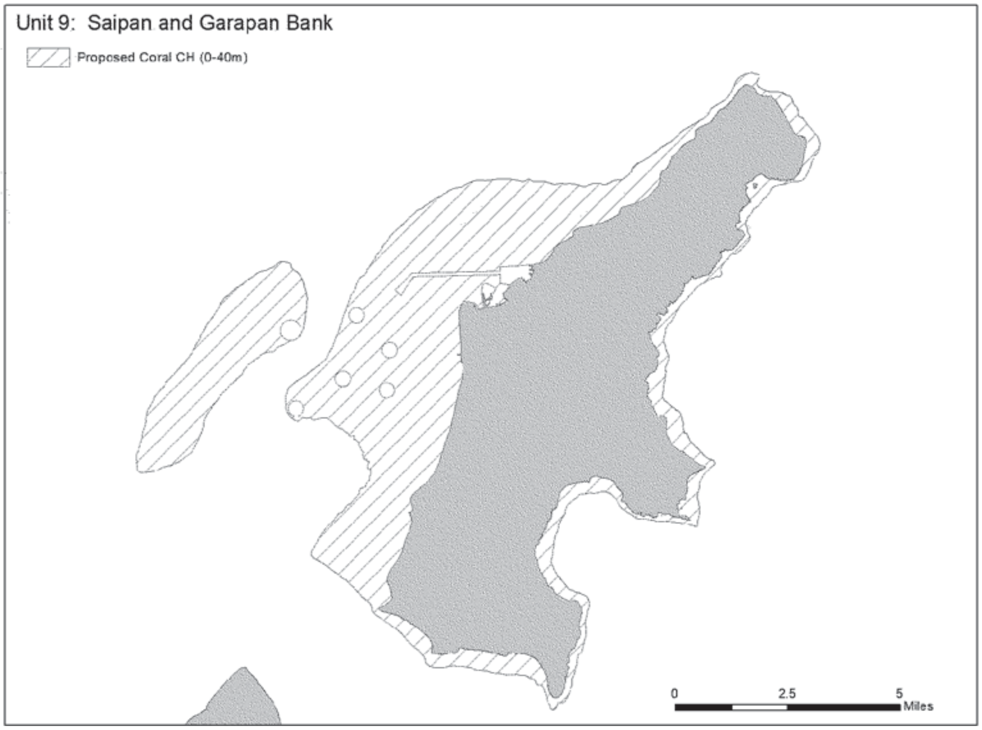

Figure 10 to paragraph (f) – Anatahan

Figure 11 to paragraph (f) – Pagan

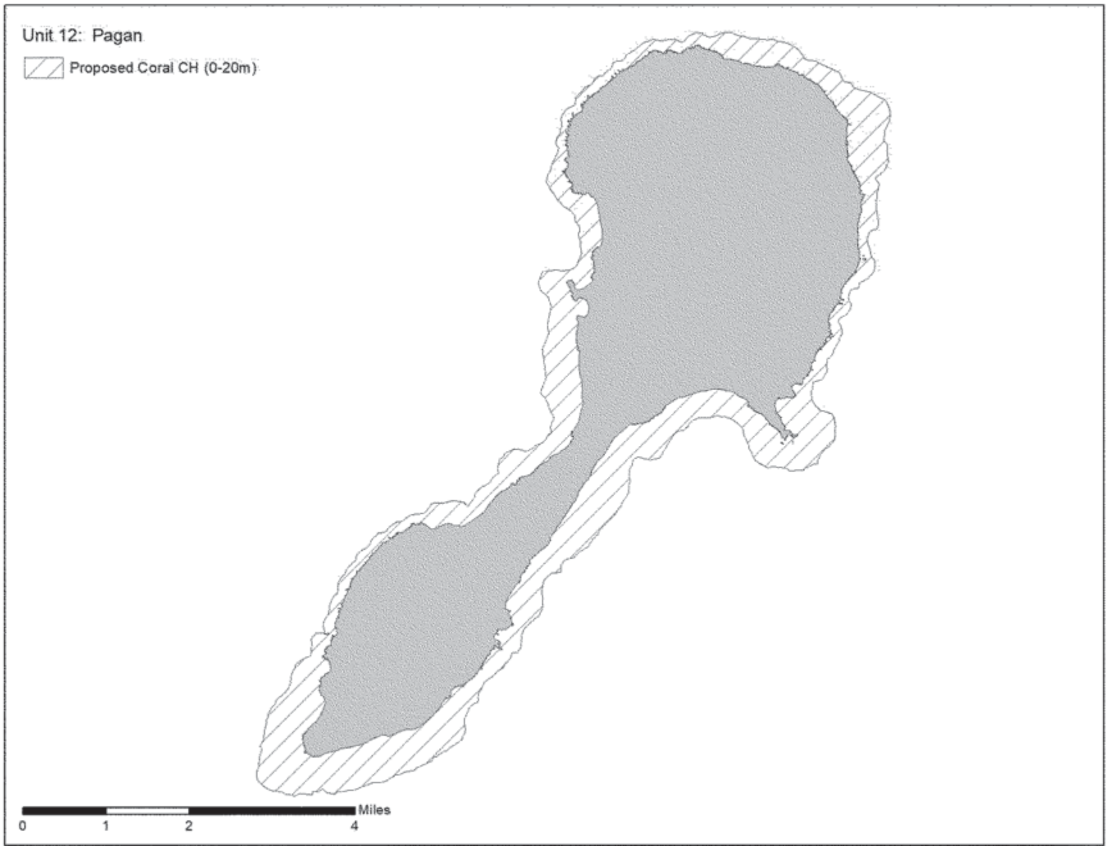

Figure 12 to paragraph (f) – Maug Islands and Supply Reef

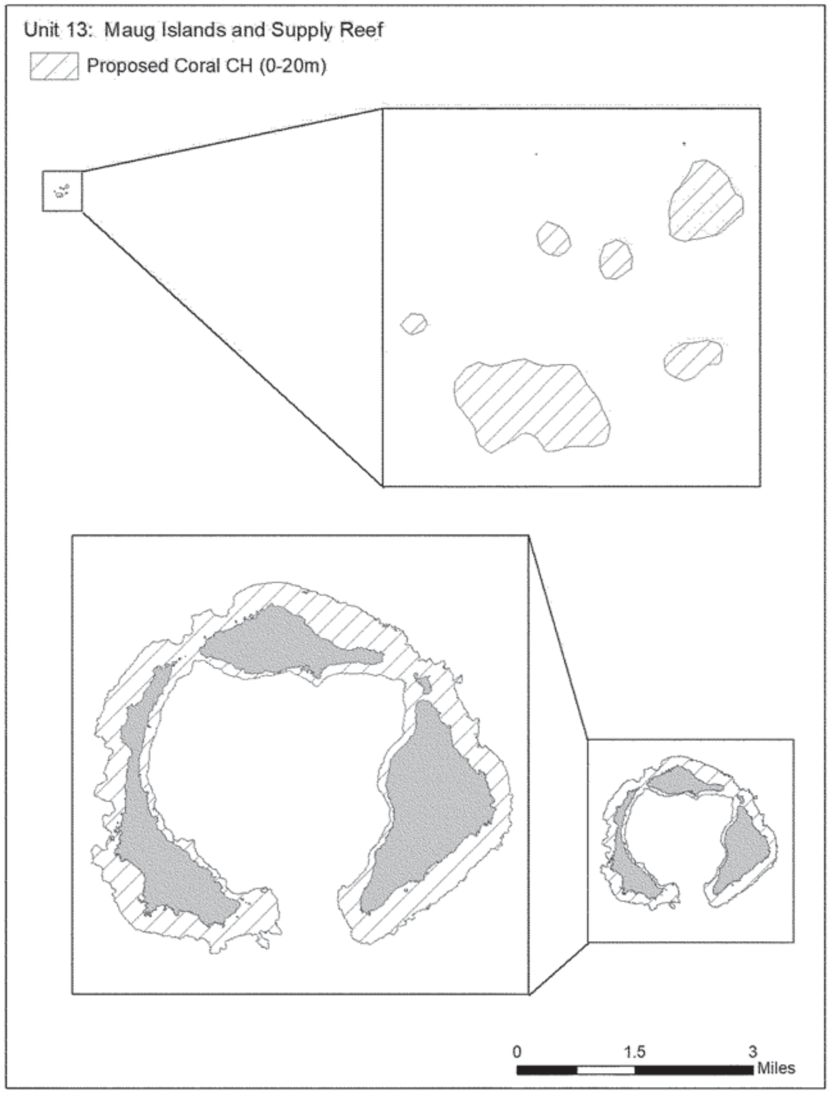

Figure 13 to paragraph (f) – Howland Island

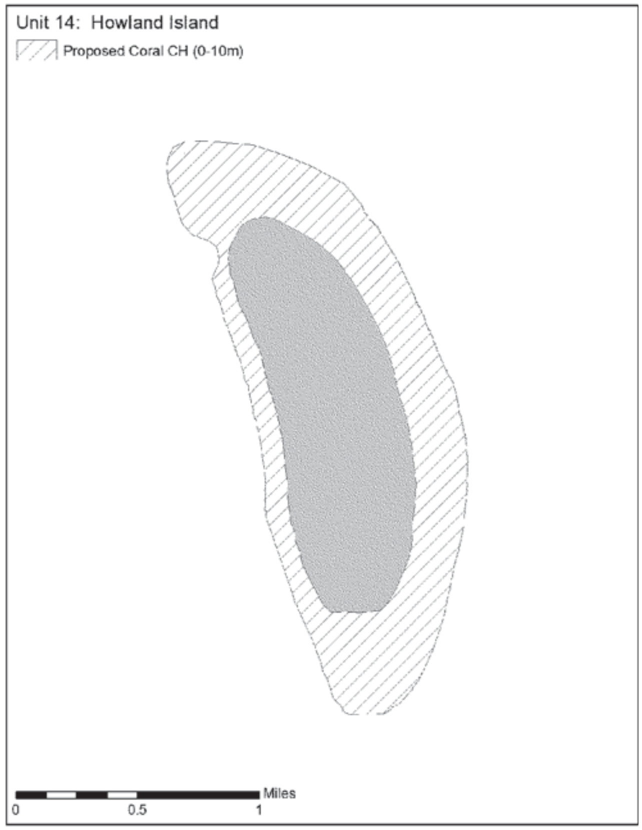

Figure 14 to paragraph (f) – Palmyra Atoll

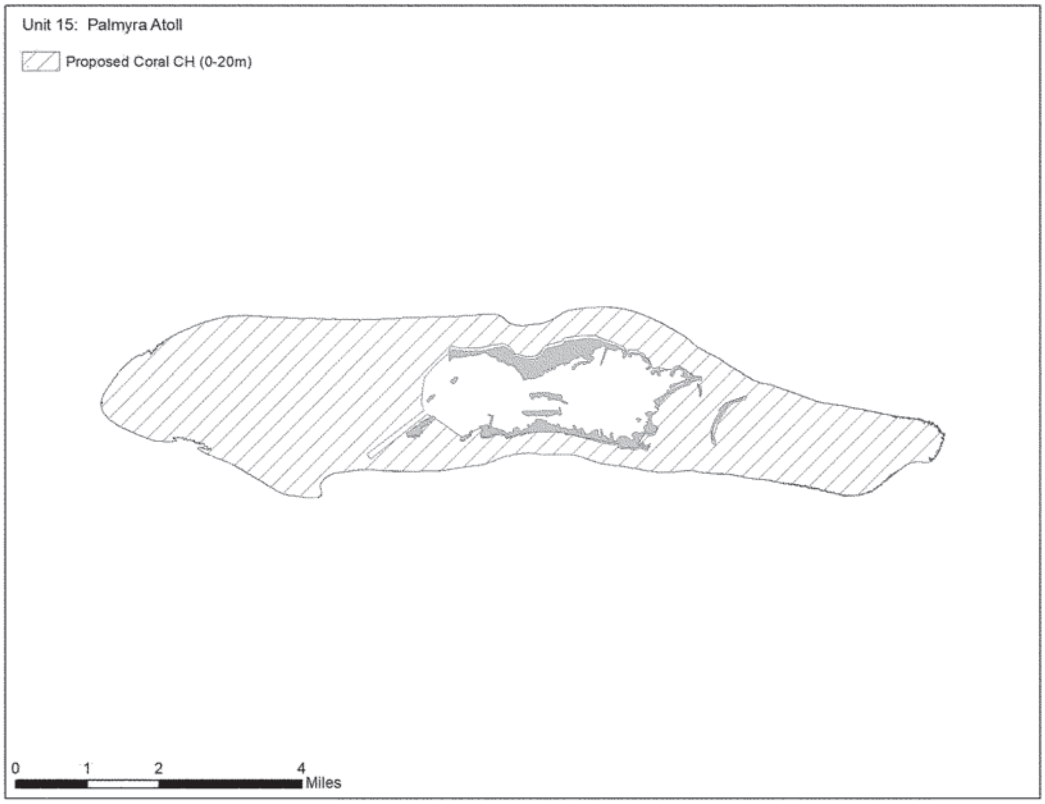

Figure 15 to paragraph (f) – Kingman Reef

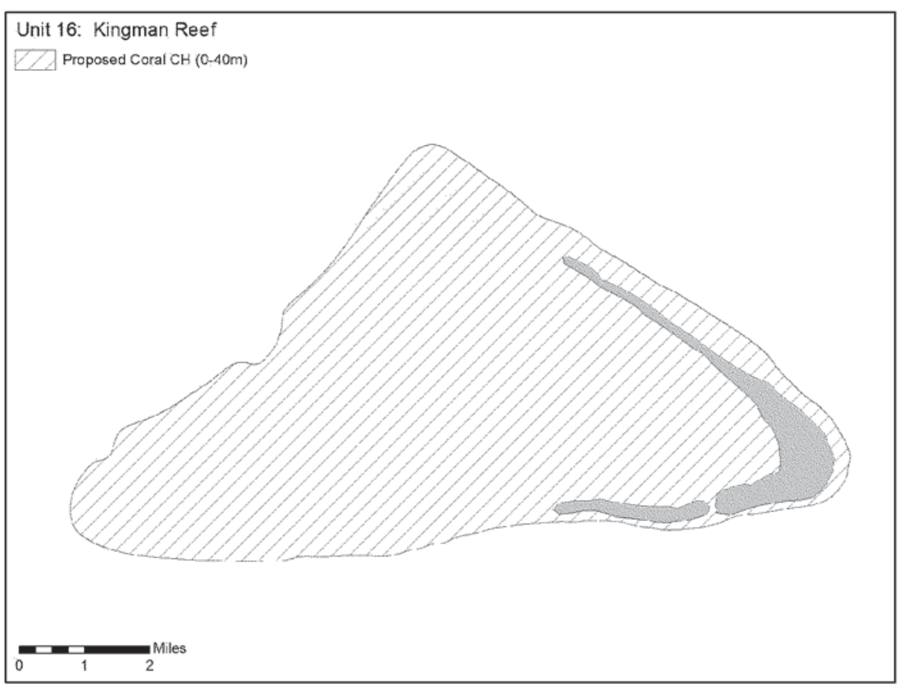

Figure 16 to paragraph (f) – Johnston Atoll

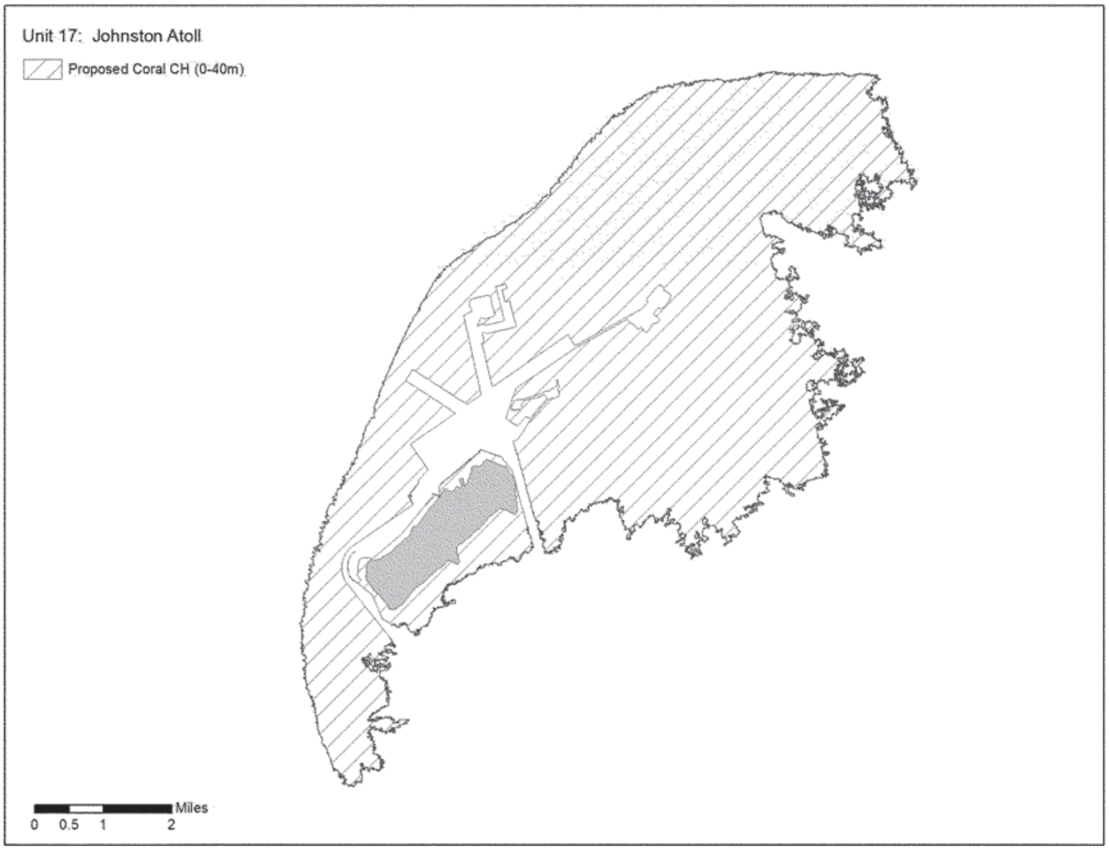

Figure 17 to paragraph (f) – Jarvis Island.

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