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**50 CFR Parts 223 and 226
Endangered and Threatened Species;
Critical Habitat for Threatened Elkhorn
and Staghorn Corals; Final Rule**

DEPARTMENT OF COMMERCE**National Oceanic and Atmospheric Administration****50 CFR Parts 223 and 226**

[Docket No. 070801431–81370–02]

RIN 0648–AV35

Endangered and Threatened Species; Critical Habitat for Threatened Elkhorn and Staghorn Corals

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

ACTION: Final rule.

SUMMARY: We, the National Marine Fisheries Service (NMFS), issue a final rule designating critical habitat for elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*) corals, which we listed as threatened under the Endangered Species Act of 1973, as amended (ESA), on May 9, 2006. Four specific areas are designated: the Florida area, which comprises approximately 1,329 square miles (3,442 sq km) of marine habitat; the Puerto Rico area, which comprises approximately 1,383 square miles (3,582 sq km) of marine habitat; the St. John/St. Thomas area, which comprises approximately 121 square miles (313 sq km) of marine habitat; and the St. Croix area, which comprises approximately 126 square miles (326 sq km) of marine habitat. We are excluding one military site, comprising approximately 5.5 square miles (14.3 sq km), because of national security impacts.

DATES: This rule becomes effective December 26, 2008.

ADDRESSES: The final rule, maps, Final Regulatory Flexibility Analysis, and 4(b)(2) Report used in preparation of this final rule, as well as comments and information received, are available on the NMFS Southeast Regional website at <http://www.sero.noaa.gov/>.

FOR FURTHER INFORMATION CONTACT: Jennifer Moore or Sarah Heberling, NMFS, at the address above or at 727–824–5312; or Marta Nammack, NMFS, at 301–713–1401.

SUPPLEMENTARY INFORMATION:**Background**

On May 9, 2006, we listed elkhorn and staghorn corals as threatened under the ESA (71 FR 26852; May 9, 2006). At the time of listing, we also announced our intention to propose critical habitat for elkhorn and staghorn corals. Critical habitat for both elkhorn and staghorn corals was proposed on February 6,

2008 (73 FR 6895); a correction notice regarding one of the maps was published on March 6, 2008 (73 FR 12068). We solicited comments from the public on all aspects of the proposed rule. An initial regulatory flexibility analysis (IRFA) and a draft impacts report prepared pursuant to section 4(b)(2) of the ESA were available for public review and comment along with the proposed rule. These documents have been finalized in support of the final critical habitat designation.

The proposed rule identified the key conservation objective for the corals as facilitating increased incidence of successful sexual and asexual reproduction. We determined the feature essential to the conservation of the species (also known as essential feature), which supports the identified conservation objective, was substrate of suitable quality and availability, in water depths from the mean high water (MHW) line to 30 m, to support successful larval settlement, recruitment, and reattachment of fragments. For purposes of this definition, “substrate of suitable quality and availability” meant consolidated hardbottom or dead coral skeleton that is free from fleshy macroalgae cover and sediment cover. We proposed to designate four specific areas that contain the essential feature: (1) the Florida area, which comprised approximately 3,301 square miles (8,550 sq km) of marine habitat; the Puerto Rico area, which comprised approximately 1,383 square miles (3,582 sq km) of marine habitat; the St. John/St. Thomas area, which comprised approximately 121 square miles (313 sq km) of marine habitat; and the St. Croix area, which comprised approximately 126 square miles (326 sq km) of marine habitat. We also proposed to exclude one military site, comprising approximately 47 square miles (123 sq km), because of national security impacts.

Elkhorn and Staghorn Coral Natural History

The following discussion of the life history and reproductive biology of threatened corals is based on the best scientific data available, including the Atlantic *Acropora* Status Review Report (*Acropora* Biological Review Team, 2005), and additional information, particularly concerning the genetics of these corals.

Acropora spp. are widely distributed throughout the Caribbean (U.S. - Florida, Puerto Rico, U.S. Virgin Islands (U.S.V.I.), Navassa; and Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Colombia,

Costa Rica, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Honduras, Jamaica, Martinique, Mexico, Netherlands Antilles, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, and Venezuela). In general, elkhorn and staghorn corals have the same geographic distribution, with a few exceptions. The maximum northern extent (Palm Beach County, Florida) of staghorn coral occurrence is farther north than that of elkhorn coral (Broward County, Florida). Staghorn coral commonly grows in more protected, deeper water ranging from 5 to 20 m in depth and has been found in rare instances to 60 m. Elkhorn coral commonly grows in turbulent shallow water on the seaward face of reefs in water ranging from 1 to 5 m in depth but has been found to 30 m depth.

Elkhorn and staghorn corals were once the most abundant and most important species on Caribbean coral reefs in terms of accretion of reef structure. Relative to other corals, elkhorn and staghorn corals have high growth rates that have allowed reef growth to keep pace with past changes in sea level. Both species exhibit branching morphologies that provide important habitat for other reef organisms. Environmental influences (e.g., wave action, currents) result in morphological variation (e.g., length and shape of branches) in both species.

Staghorn coral is characterized by staghorn antler-like colonies with cylindrical, straight, or slightly curved branches. The diameter of staghorn coral branches ranges from 1 to 4 cm, and tissue color ranges from golden yellow to medium brown. The growing tips of staghorn coral tend to be lighter or lack color. The linear growth rate for staghorn coral has been reported to range from 3 to 11.5 cm/year. Today, staghorn coral colonies typically exist as isolated branches and small thickets, 0.5 to 1 m across in size, unlike the vast fields (thickets) of staghorn found commonly during the 1970s.

Elkhorn coral is the larger species of *Acropora* found in the Atlantic. Colonies are flattened to near round with frond-like branches. Branches are up to 50 cm across and range in thickness from 2 to 10 cm, tapering towards the branch terminal. Like staghorn coral, branches are white near the growing tip, and brown to tan away from the growing area. The linear growth rate for elkhorn coral is reported to range from 4 to 11 cm/year. Individual colonies can grow to at least 2 m in height and 4 m in diameter.

Elkhorn and staghorn corals require relatively clear, well-circulated water

and are almost entirely dependent upon sunlight for nourishment through the photosynthetic products of their symbiotic zooxanthellae. Unlike other coral species, neither acroporid species is likely to compensate for long-term reductions in water clarity with alternate food sources, such as zooplankton and suspended particulate matter. Typical water temperatures in which *Acropora* spp. occur range from 21° to 29° C, with the species being able to tolerate temperatures higher than the seasonal maximum for a brief period of time (days to weeks, depending on the magnitude of the temperature elevation). The species' response to temperature perturbations is dependent on the duration and intensity of the event. Both acroporids are susceptible to bleaching (loss of symbiotic algae) under adverse environmental conditions.

Acropora spp. reproduce both sexually and asexually. Elkhorn and staghorn corals do not differ substantially in their sexual reproductive biology. Both species are broadcast spawners: male and female gametes are released into the water column where fertilization takes place. Additionally, both species are simultaneous hermaphrodites, meaning that a given colony will contain both male and female reproductive parts during the spawning season; however, an individual colony or clone will not produce viable offspring. The spawning season for elkhorn and staghorn corals is relatively short, with gametes released on only a few nights during July, August, or September. In most populations, spawning is synchronous after the full moon during any of these 3 months. Larger colonies of elkhorn and staghorn corals have much higher fecundity rates (Soong and Lang, 1992).

In elkhorn and staghorn corals, fertilization and development is exclusively external. Embryonic development culminates with the development of planktonic larvae called planulae. Little is known concerning the settlement patterns of planula of elkhorn and staghorn 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. Like most corals, elkhorn and staghorn corals require hard, consolidated substrate, including attached, dead coral skeleton, for their larvae to settle. Unlike most other coral larvae, elkhorn (and presumably staghorn) planulae appear to prefer settling on upper, exposed surfaces,

rather than in dark, cryptic ones, at least in a laboratory setting (Szmant and Miller, 2005).

Coral planula larvae experience considerable mortality (90 percent or more) from predation or other factors prior to settlement and metamorphosis (Goreau *et al.*, 1981). Because newly settled corals barely protrude above the substrate, juveniles need to reach a certain size to reduce damage or mortality from impacts such as grazing, sediment burial, and algal overgrowth. It is at this size (approximately 1 cm in diameter) and this age (approximately 1 year) that a settled individual can be considered to have recruited into the population. Recent studies examining early survivorship indicated that lab cultured elkhorn coral settled onto experimental limestone plates and placed in the field had substantially higher survivorship than another spawning coral species, *Montastraea faveolata*, and similar survivorship to brooding coral species (species that retain developing larvae within the parent polyp until an advanced stage) over the first 9 months following settlement (Szmant and Miller, 2005). This pattern corresponds to the size of planulae; elkhorn coral eggs and larvae are much larger than those of *Montastraea* spp. Overall, older recruits (i.e., those that survive to a size where they are visible to the human eye, probably 1 to 2 years post-settlement) of *Acropora* spp. appear to have similar growth and post-settlement mortality rates observed in other coral species.

Studies of *Acropora* spp. sexual recruitment from across the Caribbean reveal two problematic patterns: (1) low juvenile densities relative to other coral species; and (2) low juvenile densities relative to the commonness of adults (Porter, 1987). This suggests that the composition of the adult population is based upon variable recruitment. To date, the settlement rates for *Acropora* spp. have not been quantified.

Few data on the genetic population structure of elkhorn and staghorn corals exist; however, due to recent advances in technology, the genetic population structure of the current, depleted populations are beginning to be characterized. Baums *et al.* (2005) examined the genetic exchange in elkhorn coral by sampling and genotyping colonies from eleven locations throughout its geographic range using microsatellite markers. Results indicate that elkhorn populations in the eastern Caribbean (St. Vincent and the Grenadines, U.S.V.I., Curacao, and Bonaire) have experienced little or no genetic exchange with populations in the

western Caribbean (Bahamas, Florida, Mexico, Panama, Navassa, and Mona Island). Mainland Puerto Rico is an area of mixing where elkhorn populations show genetic contribution from both regions, though it is more closely connected with the western Caribbean. Within these regions, the degree of larval exchange appears to be asymmetrical, with some locations being entirely self-recruiting and some receiving immigrants from other locations within their region.

Vollmer and Palumbi (2007) examined multilocus sequence data from 276 colonies of staghorn coral spread across 22 populations from 9 regions in the Caribbean, Florida, and the Bahamas. Their data were consistent with the Western-Eastern Caribbean subdivision observed in elkhorn coral populations by Baums *et al.* (2005). Additionally, the data indicated that regional populations of staghorn separated by greater than 500 km are genetically differentiated and that gene flow across the greater Caribbean is low in staghorn coral. This is consistent with studies conducted on other Caribbean corals showing that gene flow is restricted at spatial scales over 500 km (Fukami *et al.*, 2004; Baums *et al.*, 2005; Brazeau *et al.*, 2005). Furthermore, fine-scale genetic differences were observed among reefs separated by as little as 2 km, suggesting that gene flow in staghorn corals may be limited over much smaller spatial scales (Vollmer and Palumbi, 2007).

Both acroporid population genetics studies suggest that no population is more or less significant to the status of the species. Staghorn coral populations on one reef exhibit limited ability to seed another population separated by large distances. Elkhorn coral populations are genetically related over larger geographic distances; however, because sexual recruitment levels are extremely low, re-seeding potential over long distances is also minimal. This regional population structure suggests that conservation should be implemented at local to regional scales because relying on long-distance larval dispersal as a means of recovery may be unreliable and infeasible. Therefore, protecting source populations, in relatively close proximity to each other (<500 km), is likely the more effective conservation alternative (Vollmer and Palumbi, 2007).

Elkhorn and staghorn corals, like most coral species, also reproduce asexually. Asexual reproduction involves fragmentation, wherein colony pieces or fragments break from a larger colony and re-attach to consolidated, hard substrate to form a new colony.

Reattachment occurs when: (1) live coral tissue on the fragment overgrows suitable substrate where it touches after falling; or (2) encrusting organisms settle on the dead basal areas of the fragment and cement it to the adjacent substrate (Tunncliffe, 1981). Fragmentation results in multiple colonies (ramets) that are genetically identical, while sexual reproduction results in the creation of new genotypes (genets). Fragmentation is the most common means of forming new elkhorn and staghorn coral colonies in most populations and plays a major role in maintaining local populations when sexual recruitment is limited. The larger size of fragments compared to planulae may result in higher survivorship after recruitment (Jackson, 1977, as cited by Lirman, 2000). Also, unlike sexual reproduction, which is restricted seasonally for elkhorn coral (Szmant, 1986, as cited by Lirman, 2000), fragmentation can take place year-round.

Summary of Comments and Responses

We requested comments on the proposed rule to designate critical habitat for elkhorn and staghorn corals (73 FR 6895; February 6, 2008). To facilitate public participation, the proposed rule was made available on our regional web page and comments were accepted via standard mail, facsimile, and through the Federal eRulemaking portal. In addition to the proposed rule, the draft impacts report supporting NMFS' conclusions under Section 4(b)(2) of the ESA was posted. We obtained independent peer review of both the scientific information and of the Draft 4(b)(2) Report (NMFS, 2007) that supported the proposed rule, and we incorporated the peer review comments prior to dissemination of the proposed rule. Four public hearings were held on the following dates and in the following locations:

1. Tuesday, March 4, 2008, Dania Beach, Florida.
2. Wednesday, March 5, 2008, Marathon, Florida.
3. Tuesday, March 11, 2008, St. Thomas, U.S.V.I./Simulcast Location in Kingshill, St. Croix, U.S.V.I.
4. Wednesday, March 12, 2008, Rio Piedras, Puerto Rico.

We have considered all public comments, and those that are germane to the proposed designation are addressed in the following summary. We have assigned comments to major issue categories and, where appropriate, have combined similar comments.

Comments on the Conservation Goal of the Designation

Comment 1: One commenter suggested that the conservation goal of the critical habitat designation should include survival to juvenile sizes.

Response: We stated in the proposed designation that the essential feature supports successful larval settlement, recruitment, and reattachment of fragments. The species' larvae and newly settled spat are microscopic. It takes approximately 1 year from the time of settlement for the recruit to become visible to the unaided human eye. It is at this point that we can conclude that the offspring has recruited into the population. Therefore, the habitat must be suitable to allow for the offspring to reach this size. It is unclear what the commenter specifically considers as a juvenile, thus we clarify that the conservation goal does include survival to recruitment.

Comment 2: One commenter suggested that we do not know what caused the decline of the species; therefore, we cannot identify the essential feature for elkhorn and staghorn corals. Another commenter questioned the utility of critical habitat, given the seemingly unresolved major threats to the species.

Response: The status review, listing process, and supporting literature have identified several causes of the decline of the species. We determined that disease, temperature-induced bleaching, and hurricanes are the major threats to the species. The ESA and our regulations for designating critical habitat (50 CFR 424) specify that we focus on the essential physical or biological features to support the species' conservation. We determined that the identified essential feature of suitable settlement and reattachment substrate will support the key conservation objective for both species of facilitating increased incidence of successful sexual and asexual reproduction.

Comment 3: One commenter said that, although we identified the conservation goal of critical habitat to be the enhancement of sexual and asexual recruitment, our rule focuses on sexual recruitment.

Response: We determined, based on the species' natural history and the threats facing them, that facilitating increased incidence of successful reproduction, both sexual and asexual, is the key objective to the conservation of these species. We stated in the proposed rule that the feature supporting this objective was "substrate of suitable quality and availability to

support successful larval settlement, recruitment, and reattachment of fragments." We realize that the placement of the conjunction "and" may have misled the reader that the conservation objective did not support the recruitment of fragments. We are revising the definition of the feature that supports this objective to clarify this point. The feature is now defined as substrate of suitable quality and availability to support successful larval settlement and recruitment and the reattachment and recruitment of fragments. Sexual recruits and asexual recruits require the same feature to allow for settlement or reattachment, respectively. Therefore, the designation does not focus on sexual recruitment alone; rather, we state that increasing the incidence of both modes of reproduction is essential to the conservation of the species.

Comments on the Definition of the Essential Feature

Comment 4: One commenter stated we failed to appropriately define "consolidated hardbottom" in our definition of the essential feature. A second commenter stated that we should not use the term hardbottom, rather the more appropriate term would be hard substrate.

Response: We acknowledge the need to define these terms precisely as there are several definitions of the term hardbottom. The established definition of hardbottom for the NOAA Coral Reef Conservation Program is substrate formed by the deposition of calcium carbonate by reef building corals and other organisms, or existing as bedrock or volcanic rock usually of minimal relief (<http://www.coris.noaa.gov/glossary>). This definition is more restrictive than what we intended for this designation; so we are revising the term "hardbottom" to "hard substrate," as suggested by the second commenter, to be inclusive of all the suitable substrate within the designation that is essential to the conservation of the species. We are retaining the term "consolidated" in the definition of the essential feature because the hard substrate must be stable to support the conservation objective. A disaggregated hard substrate, such as loose rubble, which can become mobilized and abrade the recruits, would not be of suitable quality.

Comment 5: One commenter stated we needed to clarify that absence of macroalgal cover in our definition of "suitable substrate" does not mean absence of crustose coralline algae (CCA), but refers to macroalgae and turf algae.

Response: The commenter is correct: we are not referring to CCA in this instance. Further, as we discussed in the proposed rule, studies have shown that larvae tend to prefer substrate covered with CCA for settlement. The commenter also correctly pointed out that not only fleshy macroalgae, but also turf algae, prevent the settlement of larvae and the reattachment of fragments. Therefore, we are adding the word “turf” to the definition of the essential feature.

Comment 6: Several commenters stated that no reefs exist without macroalgae and sediment; thus no reef would meet the identified definition of critical habitat. One commenter added that conditions change over time and we should add the word “persistent” before “fleshy macroalgae”.

Response: Coral reef ecosystems are a mosaic of several different substrate types, including consolidated hard substrate, macroalgae, unconsolidated sediment, and seagrass. Although few reefs exist that are wholly lacking in some macroalgae or sediment cover, at a scale appropriate to a coral larva or coral fragment, a reef must contain available hard substrate for the settlement, attachment, and recruitment. Without the available substrate, the area would cease to be a coral reef because reef accretion would not be possible. The identified essential feature is contained within the specific areas identified as critical habitat. It is not necessary for the entire area or even entire reef to be lacking in macroalgae to designate it as critical habitat.

Regarding the persistence of the essential feature, we acknowledge that conditions within the reef ecosystem may change over time. However, regardless of the persistence of the macroalgae, if the substrate is covered with macroalgae at the time of potential settlement, reattachment, and recruitment, the substrate would not be of suitable availability to support the conservation objective. Thus we are not revising the definition of the essential feature to include the word “persistent.”

Comment 7: One commenter requested reef covered with macroalgae not be exempted from critical habitat.

Response: Reefs that contain macroalgae are not exempted from critical habitat. While neither coral larvae nor coral fragments can attach to substrate that is covered with macroalgae, and substrate covered with macroalgae does not provide substrate of suitable availability to support the conservation of the species, when these areas are part of the coral reef ecosystem meeting the definition of critical habitat (which as explained above consists of a

mosaic of several different substrate types, including consolidated hard substrate, macroalgae, unconsolidated sediment, and seagrass), they are not exempted from the designation.

Comment 8: One commenter stated that parrotfish, other herbivorous fishes, and long-spined sea urchin are biological features essential to the conservation of listed corals (i.e., essential features) because these herbivores reduce the abundance of macroalgae through grazing.

Response: In the proposed rule, we acknowledged that the shift in benthic community structure from the dominance of stony corals to fleshy algae on Caribbean coral reefs is generally attributed to the greater persistence of fleshy macroalgae under reduced grazing regimes due to human overexploitation of herbivorous fishes (Hughes, 1994) and the regional mass mortality of the herbivorous long-spined sea urchin in 1983–84. However, the herbivores themselves are not the essential feature for elkhorn and staghorn corals. Rather, herbivores mediate the availability of the essential feature, similar to the effect nutrients have on the growth of macroalgae.

Comment 9: One commenter suggested “consolidated hardbottom or dead coral skeletons exposed to sunlight, free from sediment, not preempted by other attached organisms, and within 30 m of the water surface” as an alternate way to define the essential feature to make the rule more easily understood.

Response: We believe that our definition encompasses the concepts in the suggested alternative definition. We do not explicitly state that the substrate must be exposed to sunlight, because only artificial structures (e.g., docks or bridges) would preempt the transmission of sunlight to the substrate, given the shallow depths of the areas included in the designation. As discussed in the response to Comment 13, existing federally authorized or permitted man-made structures do not provide the essential feature. Thus, all natural consolidated hard substrate in depths less than 30 m are likely exposed to some sunlight. We define the essential feature as being free from fleshy or turf macroalgae cover, rather than all attached organisms because algae in excessive abundances preempts larva and fragments from attachment and recruitment. No other species is known to be susceptible to proliferation that results in the preemption of substrate. Other reef organisms are naturally occurring and do not necessarily interfere with settlement, recruitment, or reattachment of elkhorn

and staghorn corals. Therefore, we believe our definition is sufficient to describe the essential feature for elkhorn and staghorn corals’ conservation.

Comment 10: Two commenters requested the essential feature also include any habitat that could be recovered or rehabilitated.

Response: ESA Section 4(a)(3)(i) defines critical habitat, in part, as occupied areas that contain features essential to a species’ conservation. We do not have the authority to designate areas where features may exist in the future once habitat is recovered or rehabilitated.

Comment 11: Several commenters stated that the proposed designation fails to account for essential features other than suitable substrate and specifically suggested that we add “suitable water quality and temperature” as essential features. Some of these commenters pointed to statements in the Status Review for the two corals that noted these species’ need for “relatively clear, well-circulated water,” “sunlight for nourishment,” “optimal water temperature,” and “near oceanic salinities.” Some of the commenters went on to state that the combined stresses of warmer temperatures, rising sea levels, and ocean acidification should be considered as part of the corals’ need for good water quality in the critical habitat designation.

Response: We stated in the Status Review that the species’ general environmental requirements are those summarized by the commenter. As stated in the proposed critical habitat rule, other than the substrate feature, we determined that no other facet of the corals’ environment is appropriate to include as a basis for the critical habitat designation. Rather, we determined that water temperature and aspects of water quality are more appropriately viewed as sources of impacts or stressors that can harm the corals directly. For example, the corals can survive a range of water temperatures, and they exhibit stress at temperatures above and below this range. Similarly, corals exist and function within a range of oceanic acidity levels; if the water becomes too acidic or too alkaline, conditions are unsuitable for secretion of an aragonitic skeleton. However, for elkhorn and staghorn corals, we cannot identify any specific values, ranges, or thresholds for these or other water quality parameters that make them essential to the conservation of these corals. Consultations on whether a proposed action may affect “suitable water quality or temperature” would necessarily be limited to determining whether the

activity would cause harm to the corals, and only provides for analysis under the jeopardy prong. We therefore did not adopt the suggestion to include "suitable water quality and temperature" as essential features. Finally, we stated in the proposed rule that some environmental features are subsumed within the definition of the substrate essential feature. In this final rule, we define "substrate of suitable quality and availability" as "consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover." Substrate free from macroalgae cover and sediment cover would encompass water quality sufficiently free of nutrients and sediments. Therefore, Federal activities that impact water quality by increasing nutrients or sediments may affect the essential substrate feature, and would require ESA section 7 consultation.

Comment 12: One commenter stated that, in identifying the example list of existing man-made structures that do not provide the essential feature, the proposed rule lacked clarity in its description of maintained channels. The commenter requested that we provide an adequate description of what is considered to be a maintained channel (e.g., would it include channel floor, channel walls and any authorized structures associated with the channel like jetties and groins?).

Response: In identifying existing man-made structures that do not provide the essential feature essential to the corals' conservation, our intention was to inform the public that Federal actions, or the effects thereof, limited to these areas would not trigger section 7 consultation under the ESA, unless they may affect the species and/or the essential feature in adjacent critical habitat. In the preamble of this final rule, we are revising the language describing the structures to more clearly reflect our intention (see Specific Areas Within the Geographical Area Occupied by the Species). The statement referring to these structures has been revised to: "All existing (meaning constructed at the time of this critical habitat designation) Federally authorized or permitted man-made structures such as aids-to-navigation (ATONs), artificial reefs, boat ramps, docks, pilings, maintained channels, or marinas do not provide the essential feature that is essential to the species' conservation." To further inform the public, we are specifically not including as part of the critical habitat all existing federally authorized navigation channels and harbors because they do not provide the essential feature.

Comment 13: One commenter requested that we add regulatory language to the critical habitat designation to specifically list those natural and artificial features that do not provide the essential feature.

Response: In the regulatory text, we define the essential feature for elkhorn and staghorn corals as substrate of suitable quality and availability to support larval settlement and recruitment, and reattachment and recruitment of asexual fragments. "Substrate of suitable quality and availability" is defined as natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover. We believe this definition is precise enough that natural and artificial features that do not constitute the essential feature are plainly discernable. This type of information is included in the preamble to this final rule to provide context and explanation of the features that do and do not provide the essential feature, but is not intended to be exhaustive, as that would not be practicable.

Comments on the Data Supporting the Designation

Comment 14: Two commenters submitted data containing the locations of occurrences of the species in Puerto Rico and the U.S.V.I.

Response: We appreciate the additional data and have referenced it in the preamble of the designation in the appropriate section. However, the data do not change the geographical range occupied by the species. Further, the data do not change the designation of the critical habitat areas around Puerto Rico and the U.S.V.I.

Comment 15: Two commenters stated we should closely scrutinize the quality of data giving rise to the geographic extent of occupied areas. The commenters were specifically interested in the data collection methodologies as well as the number and location of elkhorn or staghorn coral documented in the waters north of Boca Raton.

Response: The data that we used to identify the occupied area of the species has come from various sources, including literature, researchers, resource agencies, and local divers. Those data submitted by local divers have all included photos of the species and a latitude and longitude of the location where the species was found. We are confident that those who have submitted data are proficient enough in species identification, as evidenced by the photos, and use of a geographic positioning system. Further, the data from the northernmost locations of the

species have been submitted by a county natural resource agency employee and an environmental consultant. Though there are few data from the northernmost portion of the species' ranges, this is likely due to the relatively recent expansion of reef research into this geographic area. We believe the quality of the data that we have used to identify the area occupied by the species is the best available and sufficient for the purposes of designation.

Comment 16: One commenter questioned the potential errors in geographical information system (GIS) data developed using aerial photos from a one-time snapshot at an acre pixel scale. The commenter also questioned how we will address presence/absence of the essential feature when it comes time for a consultation.

Response: We fully acknowledge that the GIS data may be imperfect due to the age and methods of collection, but it is the best available. We relied on the data to identify discrete areas that contain the essential feature interspersed among the other natural features of the coral reef ecosystem, including seagrass, macroalgae, and unconsolidated sediment. At the time of consultation, the Federal agency may use all existing data or choose to collect new data to determine whether its action may affect the essential feature.

Comments on the Boundaries of the Designation

Comment 17: We received several comments suggesting that, by designating the north boundary of the Florida area at the boundary between Martin and Palm Beach counties, we included areas outside of the historic or current range for elkhorn and staghorn coral and areas that do not provide for the conservation of the species.

Response: We acknowledge that the northern extent of the ranges of these species is south of the northern Palm Beach County line and, upon additional examination, were able to more accurately designate the northern boundary of the Florida area at Boynton Inlet, Palm Beach County, at 26° 32' 42.5" N. We are modifying the northern boundary accordingly in this final rule. We have no knowledge of either species of *Acropora* historically or presently occurring north of this boundary.

Comment 18: Several commenters stated that these corals do not grow in the intertidal zone and requested that we consider mean low water (MLW) as the shoreward boundary rather than mean high water (MHW).

Response: We acknowledge that these species do not grow in the intertidal

zone. The territorial sea baseline is defined at 33 CFR 2.20 as “the mean low water line along the coast of the United States”, which further notes that charts depicting the baseline are available for examination. Therefore, we are changing the shoreward boundary to MLW in this final rule.

Comment 19: Two commenters stated that the nearshore surf zones of Palm Beach, Broward, and Miami-Dade Counties are areas with high sediment movement, suspension, and deposition levels. Hard bottom areas found within these nearshore surf zones are ephemeral in nature and are frequently covered by sand, thus not meeting the definition of the proposed essential feature. The commenter requested the shoreward boundary of the Florida area be moved offshore in Palm Beach, Broward, and Miami-Dade Counties to at least the 1–5 meter depth contour.

Response: Conditions along the east coast of Florida in the nearshore surf zone are not conducive for the identified conservation goal of increased sexual and asexual recruitment. The hydrodynamic conditions in this portion of the species’ range are very different from those further south in Florida and around islands in the Caribbean, like Puerto Rico and the U.S.V.I. Additionally, upon additional review of the current and historic occurrence data for the two species along the east coast of Florida, there were no occurrences in water less than 6 feet (1.8 m) deep. Therefore, in this final rule, we are changing the shoreward boundary for the Florida area to the 6–ft (1.8 m) contour from the north boundary at Boynton Inlet south to Government Cut, where it moves inshore to MLW. Government Cut was identified as the southernmost boundary where there were no occurrences of either species in less than 6 feet (1.8 m) of water. There are occurrences of the species in less than 6 feet (1.8 m) of water south of Government Cut, thus indicating that hydrodynamic conditions are suitable for recruitment in shallower waters.

Comment 20: One commenter stated that the species does not occur in the Gulf of Mexico and suggested the boundary of the Florida area be changed to the South Atlantic Fishery Management Council (SAFMC) boundary.

Response: We acknowledge that the SAFMC boundary is the appropriate boundary in the Florida area given the occupied range of the coral. Generally, the SAFMC boundary separates the Gulf of Mexico from the Atlantic Ocean. In this final rule, we are changing the northern boundary of the Florida Keys

portion of the Florida area to coincide with the boundary between the SAFMC boundary as defined at 50 CFR 600.105(c).

Comment 21: One commenter stated that, based on development trends and the associated anthropogenic-induced impacts, it does not appear reasonable to designate critical habitat within 100 yards (91.4 m) of any platted and improved subdivision with roads, utilities, improved shorelines, etc.

Response: The commenter does not provide a biological basis for the comment and does not describe how the area would not provide for the conservation of the species. Rather, if the “anthropogenic-induced impacts” the commenter identified could result in impacts to the essential feature and there is a Federal nexus, the species could benefit from consultation with us to identify ways to reduce the impact to the essential feature.

Comment 22: One commenter stated that *Acropora* spp. have not been documented any closer than approximately 200 yards (183 m) from the shore on the Atlantic Ocean side in the Upper and Middle Florida Keys.

Response: The commenter is correct that we do not have specific data of the species occurring within the distance stated. While that area has not been surveyed specifically for *Acropora* spp., the area is considered occupied given the range of this species and because the habitat may be conducive for the species. Staghorn coral particularly is often found in the back reef and lagoonal areas of the coral reef ecosystem, the habitat that occurs in the stated distance from shore. Therefore, we have no basis to designate a different shoreward boundary within the Upper and Middle Florida Keys.

Comment 23: One commenter stated that there have been no documented acroporid colonies within any portion of Biscayne Bay, including residential canal systems or tributaries to Biscayne Bay or the Intracoastal Waterway.

Response: Per textual description in the proposed rule and the correction to the maps in the proposed rule (73 FR 12068; March 6, 2008), neither Biscayne Bay nor the Intracoastal Waterway is within the proposed critical habitat.

Comment 24: Two commenters stated that Monroe County and Miami-Dade County typically do not appear to be suitable for colonization of *Acropora* spp. within the residential canals and man-made basins due to poor water quality. These systems usually exhibit high turbidity, suspended sediments, low water clarity, poor flushing/circulation, and nutrient/freshwater influxes from upland runoff.

Response: As stated in this rule, all existing federally authorized or permitted man-made structures, including canals and marinas, do not provide the essential feature; and therefore, are not included in the designation.

Comment 25: One commenter suggested that we more clearly map the designated area’s inland boundaries as few people are familiar with the COLREGS line. Another commenter requested that we define the COLREGS line.

Response: The COLREGS line is defined as the lines of demarcation delineating those waters upon which mariners shall comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and those waters upon which mariners shall comply with the Inland Navigation Rules. The waters inside of the lines are Inland Rules waters. The waters outside the lines are COLREGS waters. So, in other words, the COLREGS line separates inland from marine waters. We used the COLREGS line because it is depicted on all navigational charts and defined at 33 CFR Part 80. Last, the overview maps provided in the rule are provided for general guidance purposes only, and not as a definitive source for determining critical habitat boundaries.

Comment 26: One commenter stated that the occurrence of the essential feature within the Dry Tortugas (protected by the National Park Service) is questionable as shown by its geological history.

Response: The species have both been documented within the Dry Tortugas, and the essential feature is present. Therefore, the area remains within the designation.

Comment 27: One commenter questioned why the area between the westernmost Florida Keys and the Dry Tortugas was included in the designation. Specifically, the commenter provided information on the area around the Marquesas Keys, which demonstrated that the species do not presently occur, and have never been present in this area, based on the geologic record.

Response: We appreciate the commenter providing us with this information. Additionally, upon further review of the NOAA Biogeography Team’s Benthic Habitats of the Florida Keys data, there are very few, small areas that contain the essential feature between Boca Grande Key (approximately 12 miles (19.3 km) west of Key West) and the Dry Tortugas. However, based on the information provided by the commenter, these areas currently do not, and have never,

supported the species. The intent of critical habitat is to provide for the conservation of the species. Based on the data we had at the time of the proposed designation, we included the area between Boca Grande Key and the Dry Tortugas because we believed the area contained the essential feature and would provide for the conservation of the species. With the new information we received and reexamination of information used in developing the proposed rule, we determined that this area does not contain the feature essential to the conservation of the species. Therefore, we are not designating this area as critical habitat in this final rule. The western boundary of the Florida Keys portion of the Florida area will terminate at 82 W longitude. The Dry Tortugas portion of the Florida area will be MLW to the 98-ft (30 m) contour with an eastern boundary of 82 45' W longitude. A full description of the modified Florida area is provided in the preamble and regulatory language of this rule.

Comment 28: Several commenters expressed concern about the areas within the Florida area of the designation that do not contain the essential feature and thus are unsuitable to provide for the conservation of the species. A few commenters requested that we specifically survey and more finely map locations of the essential feature.

Response: The essential feature can be found unevenly dispersed throughout the Florida area due to trends in macroalgae coverage and naturally occurring unconsolidated sediment and seagrasses dispersed within the reef ecosystem. However, as described in the response to Comment 27, we are not designating a large portion of the proposed Florida area based on new information that the area does not contain the essential feature. Within the remainder of the Florida area, larger numbers of smaller specific areas could not be identified because the submerged nature of the essential feature, the limits of available information on the distribution of the essential feature, and limits on mapping methodologies make it infeasible to define the specific areas containing the essential feature more finely than described herein. The ESA requires us to designate critical habitat to the maximum extent prudent and determinable, based on the best information available.

Comment 29: One commenter requested that we identify all roads and bridges within the textual description and on the maps for critical habitat, as has been done for other terrestrial species. Further, the same commenter

requested that bridges be added to the list of existing man-made structures that do not provide the essential feature.

Response: We have designated critical habitat using known boundaries that are applicable to the marine ecosystem in which the species occur. We do not believe that it would be more informative to the public to identify roads and bridges on maps of the critical habitat areas. While we agree that bridges do not provide the essential feature, the list of existing man-made structures that do not provide the essential feature is not exhaustive; it is provided to give the public examples of the types of structures to which we are referring.

Comment 30: One commenter stated that we should designate all areas occupied by elkhorn and staghorn corals in Florida - especially Florida Bay - as critical habitat. The commenter also expressed concern about the quality of water entering Florida Bay from the Everglades, and stated that including Florida Bay in the critical habitat designation would benefit corals living there.

Response: As stated in the proposed rule, the critical habitat designation for threatened corals focuses on substrate of suitable quality and availability to support successful sexual and asexual reproduction of the two corals. While hardbottom does exist within Florida Bay, neither elkhorn nor staghorn coral has ever been observed or documented living in this area, making it unlikely that the larvae or fragments of either coral species would settle on or reattach to hardbottom located within Florida Bay. Therefore, we do not believe that any hard substrate in Florida Bay would contribute to the conservation objective for this designation - facilitating increased successful reproduction.

Comment 31: One commenter recommended that the designation be limited and exclude "areas with documented historical low densities, or documented current and historical absence of the species and essential feature". The commenter provided specific references to support the comment (Goenaga and Cintron, 1979; "Benthic Habitats of Puerto Rico and the U.S. Virgin Islands" by NOAA's Biogeography Program; and two maps of occurrences of *Acropora* in Miami-Dade and Monroe Counties).

Response: As stated in the response to Comment 27, we reevaluated the NOAA benthic characterization data, which supported our identification of areas that contain the essential feature. The reevaluation yielded the modification of the Florida critical habitat area based on the documented current and historical

absence of the species or essential feature, or both. The data contained in the two maps provided by the commenter were considered in the proposed rule and did not support the identification of any small specific areas that do not contain the essential feature. The reevaluation of the data did not support revision of the Puerto Rico or U.S.V.I. areas. As discussed in the Geographical Areas Occupied by the Species section of this rule, both species have been documented to occur, historically and presently, surrounding the main island and offshore cays within these areas. Goenaga and Cintron's paper is an inventory of the Puerto Rican reefs from the late 1970s. Although we have considered the information provided by the commenter, it does not support the identification of areas that do not contain the essential feature; thus, we are not revising this final rule on the basis of this information.

Comment 32: Two commenters requested exclusions and exemptions for the Port of Key West to provide for normal channel and harbor activities. A buffer around the Port was also requested.

Response: As stated in the response to Comment 13, all existing federally authorized and permitted navigation channels and harbors, which include the Port of Key West, are not included in the critical habitat, because they do not contain the essential feature. The ESA does not allow for the identification of buffers around areas not included per se. Areas that do not contain the essential feature do not meet the definition of critical habitat and therefore may not be designated. Also, areas may be excluded on the basis of economic, national security, or other relevant impacts. The area surrounding the Port of Key West meets the definition of critical habitat, and we did not identify any basis for exclusion of this area.

Comment 33: One commenter stated that we did not mention the offshore islands and cays in the U.S.V.I. as being part of the designation.

Response: As stated in the regulatory language in the proposed rule and this rule, all areas from MLW to the 98-ft (30 m) contour within the U.S.V.I. are included in the designation, which would include the offshore cays and islands.

Comment 34: One commenter requested buffer zones for critical habitat in order to avoid potential indirect impacts for any kind of project that would be developed very close to those critical habitats. A second commenter requested that we identify

the maximum distance from critical habitat a project may be to avoid direct or secondary impacts to the essential feature.

Response: While the ESA does not provide for the identification of buffer zones around critical habitat, Federal agencies authorizing, funding, or carrying out activities that occur outside critical habitat, regardless of distance from critical habitat, that may have effects to the essential feature within critical habitat must conduct an ESA section 7 consultation. Conversely, actions that have no direct or indirect effects on the essential feature - even actions within or immediately adjacent to critical habitat - would not require consultation based on critical habitat.

Comment 35: Several commenters questioned our assertion that we were only designating areas that met the definition of occupied critical habitat, because there are other substrate types interspersed with the essential feature within the designation and because there are particular sites where the corals are not present. Another commenter questioned our interpretation of “geographical area occupied” to mean the range of a species at the time of listing.

Response: We have long interpreted “geographical area occupied” in the definition of critical habitat to mean the range of the species at the time of listing (45 FR 13011; February 27, 1980). The term “specific areas” in the definition of critical habitat refers to areas on which the feature essential to a species’ conservation are found. The designated critical habitat areas fall within the geographical area occupied by both species, and the essential feature is found on these areas. We have not identified any areas outside the geographical area occupied by the species that are essential for their conservation. Therefore, we did not designate any unoccupied areas for elkhorn and staghorn corals.

Comment 36: One commenter suggested that we designate critical habitat to allow for shifts in distribution of the species and adaptation in response to global warming.

Response: The ESA does not provide for designation of critical habitat based upon speculation about expansions into habitats or ranges never occupied by the species. While the definition of critical habitat does include areas outside the geographical area occupied by the species at the time of listing, the habitat would have to be essential to the conservation of the species. As determined through the listing of elkhorn and staghorn corals, there has been no range constriction for either

species. The species currently occupy their entire historical ranges, only in lower abundances. There is no evidence that any areas outside the historical ranges of the species have suitable conditions to support the species.

Comments on ESA Section 7 Consultations and Economic Impacts

Comment 37: One commenter stated that the rule erroneously mentions only formal consultations but does not analyze informal consultations, which impact Federal agencies also.

Response: In the 4(b)(2) Report, we base our impact analysis on consultations conducted in the last 10 years that occurred in the designated areas and that may affect the designated critical habitat, regardless of whether the consultation was concluded formally or informally. We then assumed that all future consultations would be formal, acknowledging that assumption would result in an overestimation of impacts. Therefore, we did not omit informal consultations from the impacts assessment.

Comment 38: One commenter requested we specifically identify other regulations that address modifications, including those pertaining to water quality, that may be required to avoid destroying or adversely modifying the essential feature and give examples of when compliance with these other regulations would eliminate the need for ESA section 7 consultation.

Response: In our Draft 4(b)(2) Report, we identified potential project modifications that may be required to avoid destruction or adverse modification of critical habitat. Several of the potential project modifications, such as turbidity controls and conditions monitoring, are currently required by other existing regulations, such as a Clean Water Act (ESA) section 404 permit. We intended this example to illustrate that the cost of implementing these project modifications would not be solely attributable to the critical habitat designation; it was not our intention to suggest that ESA section 7 consultation would not be required if the project modification were required by another regulation. The ESA requires all Federal agencies to consult on their actions that may affect critical habitat regardless of any other regulations that may be applicable to the action. It is possible that an action may be modified by another regulatory requirement that results in removing all possible effects to critical habitat. In this case, ESA section 7 consultation would not be necessary. We have not evaluated every water quality standard or National

Pollution Discharge Elimination System (NPDES) permit to determine the effects of those Federal actions on critical habitat. It is the responsibility of the Federal action agency to determine the effects of its action on listed species and designated critical habitat. Therefore, we cannot identify specific water quality standards or NPDES conditions that do not affect critical habitat.

Comment 39: The U.S. Army Corps of Engineers (COE) commented that we underestimated the number of consultations resulting from COE regulatory projects that may affect critical habitat.

Response: During discussions with the COE as we developed this final rule, we clarified that projects occurring within (and whose effects are limited to) existing Federally authorized or permitted channels or harbors would not result in consultation because these areas do not contain the essential feature. As a result of these discussions, we continue to rely on the consultation data provided in the draft 4(b)(2) report and use this information in the impacts analysis in the final 4(b)(2) report.

Comment 40: The COE stated that we underestimated the number of Operation and Maintenance Dredging Program consultations due to the existence of the Biological Opinion on “[t]he continued hopper dredging of channels and borrow areas in the southeastern United States,” which covers all maintenance dredging of Federal channels with the use of a hopper dredge. The COE said that new individual consultations would be necessary for each maintenance event.

Response: The referenced Biological Opinion was captured in our database query and included in our impact analysis in the 4(b)(2) Report. The COE has reinitiated consultation with us for that action; therefore, the effects of all the events covered in that consultation will be considered in one consultation. The data we used included the projection of this consultation and did not underestimate the number of consultations. Moreover, as stated above, all federally authorized or permitted navigation channels are not included in the designation; thus the analysis in this reinitiated consultation will be limited to turbidity and sediment effects to areas adjacent to the channels that may contain the essential feature.

Comment 41: One commenter said our statement that “no categories of Federal actions would require consultation in the future solely due to the critical habitat designation” is incorrect. The commenter said that the

critical habitat designation is "everywhere".

Response: Our statement referred to categories of activities and not individual actions. We discussed this distinction at length in the Draft 4(b)(2) Report. The categories discussed in the 4(b)(2) Report were all determined to be capable of affecting both critical habitat and the corals themselves; activities that could adversely affect the corals would require consultation even if critical habitat were not designated.

Comment 42: One commenter questioned whether Federal agencies would have to consult on their actions if the species were present, but the project was not within the critical habitat designation.

Response: Yes, as discussed in the response to Comment 41, the responsibility for Federal agencies to consult on their actions that may affect the species initiated with the listing of the species on May 9, 2006. The species are listed wherever they occur, regardless of a critical habitat designation.

Comment 43: One commenter stated that our statement that Florida will be affected, but the Caribbean will be relatively unaffected, reflects the ignorance of the agency regarding Caribbean resources and the level of development in the islands. The commenter said the ignorance of the agency and those who wrote all documents related to this listing, not just the critical habitat rule, is further demonstrated by the statement that the rule will have little impact on dock construction because most dock construction takes place in canals. This may be the case for Florida, but the Caribbean does not have man-made canals unless they are excavated in inland marinas in areas containing salt ponds, coral reefs, and seagrass beds.

Response: Our Draft 4(b)(2) Report used the best available data to estimate potential economic impacts resulting from the designation. Consultations on dock construction are captured in our data under the category of COE-permitted construction activities. The data from the last 10 years were: 235 consultations in Florida on COE-permitted construction activities; 75 consultations in Puerto Rico on COE-permitted construction activities; and 25 consultations in the U.S.V.I on COE-permitted construction activities. These data indicate that Florida had more than twice the amount of consultations in the Caribbean; thus, the impacts to Florida from marine construction activities would be larger as a result of the designation.

We acknowledge the difference in the physical nature of the coast between Florida and the Caribbean. The Florida coastline is highly altered, and most dock construction occurs in man-made canals. Alternatively, the islands of Puerto Rico and the U.S.V.I. have a greater proportion of natural shoreline along which docks may be constructed. Further, dock construction projects are not likely to result in large impacts to critical habitat necessitating large project modifications due to: (1) the typically small action area of docks; (2) the preference for constructing docks in unconsolidated sediment to minimize the difficulty and cost of driving piles into consolidated rock; and (3) the relatively inexpensive measures to minimize impacts through essential feature avoidance and turbidity controls. Further, even given the differences in the physical nature of the shorelines, the impact of project modifications to dock construction projects due to the critical habitat designation in the Caribbean will not solely be the result of the critical habitat designation. The ESA listing and existing regulations, such as the CWA and Magnuson-Stevens Fishery Conservation and Management Act (MSA), would likely require the same avoidance and minimization measures for elkhorn and staghorn corals and other species of corals; thus, many of the costs would be coextensive with these regulations and not solely a result of the critical habitat designation.

Comment 44: One commenter stated that because we identified artificial reefs as an existing man-made structure that does not provide the essential feature, there may be an impact to projects that are required to construct artificial reefs for mitigation under the CWA regulatory programs. Further, the commenter objected to our conclusion that artificial reefs cannot serve as habitat for elkhorn and staghorn corals.

Response: The definition of critical habitat is "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 this Act, 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 protection." Because there is sufficient natural hardbottom existing to provide for the conservation of the species, artificial reefs are not essential to the conservation of the species. We identified artificial reefs in the list of existing man-made structures that do not provide the essential feature to inform the public that activities that

would affect only artificial reefs would not require ESA section 7 consultation. However, that identification in no way states whether artificial reefs should or should not be prescribed as mitigation for a particular activity under the CWA or MSA.

Comment 45: One commenter requested that we ensure that the critical habitat designation does not unduly restrict recreational boating in the region. The commenter also requested that our economic analysis recognize that the economic value of coral reefs is only made possible by the preservation and promotion of public vessel access.

Response: Nothing in this rule or the 4(b)(2) Report states that boater access will be restricted within critical habitat. As stated in the proposed rule, the primary impacts of a critical habitat designation result from the ESA section 7(a)(2) requirement that Federal agencies ensure their actions are not likely to result in the destruction or adverse modification of critical habitat. Furthermore, a critical habitat designation does not result in the creation of closed areas, preserves, or refuges. There are no individual prohibitions on any activities within critical habitat. The transit of vessels through or anchoring of vessels in areas designated as critical habitat is not prohibited.

The 4(b)(2) Report acknowledges the economic benefit coral reef associated tourism provides. The absolute value related to the boating component of that benefit can not be extrapolated from existing data. However, nothing in the rule or the 4(b)(2) Report is contrary to the supposition that recreational boating contributes to the economic benefit coral reefs provide.

Comment 46: One commenter stated that we should clarify our intentions with respect to secondary impacts from water access projects outside the critical habitat and vessel operations over critical habitat. The commenter recommended we either include language in the preamble and in subsequent guidelines and memoranda generally stating that certain secondary impacts, such as vessel operation, from facilities not located in a critical habitat area are too de minimis to affect the species.

Response: In our proposed designation and Draft 4(b)(2) Report, we did not identify normal vessel operation as an activity that would affect critical habitat.

Comment 47: One commenter stated that the proposed designation may preclude the bypassing of sand from inlets to down drift eroding beaches in

southeast Florida, requiring alternate sites on which to place the sand. This may result in increased costs from the acquisition of disposal lands.

Response: As stated in the response to Comment 20, we have moved the inshore boundary of the Florida critical habitat area to the 6 ft (1.8 m) contour. Therefore, most beaches along the east coast of Florida are no longer directly abutted by critical habitat. Even in areas where beaches may abut critical habitat, the project would only have to undergo ESA section 7 consultation for critical habitat if the essential feature were present and the project were to meet the "may affect" threshold. Even in that event, the project would not be precluded based on the presence of the essential feature and the potential for affecting it. The project would undergo consultation, and modifications appropriate for the specifics of the project to reduce the effect of the project on critical habitat may be implemented. Only in the rare instance where a proposed project was expected to result in destruction or adverse modification of critical habitat would the project be precluded, if no reasonable and prudent alternatives (RPA) were available.

Comment 48: One commenter stated that using the "Interim *Acropora* Survey Protocol for Section 7 Consultation" to survey disposal areas for inlet management projects within critical habitat was too cost prohibitive. Another commenter requested that NMFS specifically identify survey costs. One other commenter stated that requiring other agencies or the public to locate the essential feature is not consistent with the ESA.

Response: The Interim *Acropora* Survey Protocol for Section 7 Consultation is a suggested survey protocol to determine if elkhorn or staghorn is present within the action area of a Federal project. It was never intended to be a survey protocol for critical habitat. Because the need to survey for the species is a result of the listing, the associated cost would also be a result of the listing. While these surveys would also need to determine whether the hardbottom substrate PCE is present as a result of this designation, the cost of these surveys is at least partially coextensive with the listing. In addition, other existing State and Federal regulations require applicants to determine the extent of impact to benthic resources, and the benthic resources in a project area can be determined by using various survey methods. Pursuant to the ESA, it is the responsibility of the action agency to determine, on the basis of the best scientific information available, whether

its action may affect the listed species or the critical habitat. Please see the response to Comments 13 and 20 explaining why few inlet management projects would be included in the Florida area.

Comment 49: One commenter stated concern over the effect of beach renourishment projects that do not require a Federal permit because there is no in-water work. A second commenter stated concern about the effects of beach renourishment and requested less destructive techniques.

Response: The commenter is correct that non-Federal projects are not subject to ESA section 7 consultation, and the ESA does not prohibit individuals from affecting critical habitat. However, if an activity occurs on land and has effects in the waters of the United States, such as discharges of sediments or other pollutants, a Federal permit may be required for that activity, potentially under the CWA or other statutes, depending on the location. Such permits would constitute a Federal agency action requiring a section 7 consultation on affected species listed under the ESA; the effects of such a project on critical habitat would be analyzed through a biological opinion resulting from the consultation. The consultation may result in modifications to the project to reduce the impact on the critical habitat.

Comment 50: Two commenters stated that there would be economic impacts associated with the loss of shoreline protection resulting from the designation's impact on shoreline protection and beach renourishment projects by prohibiting the placement of sand along eroded beaches.

Response: We did not include the economic impact associated with loss of shoreline protection as an impact of the designation, because we do not foresee the designation prohibiting the placement of sand along beaches. The purpose of ESA section 7 consultation is to ensure the Federal activity does not result in the destruction or adverse modification of the designated critical habitat, while still meeting the objectives of the project. While beach renourishment was identified as an activity that may be affected by the designation, it is not certain that every beach renourishment project would result in destruction or adverse modification. Rather, as stated in the 4(b)(2) Report, with the implementation of modifications already required by existing regulations, beach renourishment projects may not result in large impacts to critical habitat.

Comment 51: One commenter had several comments on how the

designation would affect bridge projects, including maintenance, replacement, and new construction. The commenter requested clarification on the types of activities that would require consultation on critical habitat, specifically since Table 20 of the Draft 4(b)(2) Report did not identify "Bridge Repair" as a category of activity requiring ESA section 7 consultation for critical habitat. The commenter stated that there would be project costs and delays to determine if the species or essential feature were present.

Response: As stated in the response to Comment 13, all existing, federally authorized or permitted structures do not provide the essential feature for elkhorn and staghorn corals. Therefore, if the specific "Bridge Repair" activity only involved modifications to the existing structure and there were no effects to the essential feature, no consultation for critical habitat would be required. If the project were to include the construction of a new structure and that construction may affect listed species or critical habitat, the standard ESA section 7 consultation requirements would apply. Consultation for effects to elkhorn or staghorn coral resulting from the new construction would be required due to the listing whether or not critical habitat is designated.

Comment 52: One commenter requested we revise the 4(b)(2) Report to include the costs of anticipated measures and best management practices resulting from the designation.

Response: The Final 4(b)(2) Report includes the best available information on the costs of the identified project modifications. We did not receive any specific information during the comment period to alter the cost estimates of any of the identified project modifications; thus the Final 4(b)(2) Report includes the costs expected to result from the designation.

Comment 53: One commenter stated considerations should be given to the economic effect of the critical habitat designation; the designation should especially consider any disproportionate effect on small businesses.

Response. In the final regulatory flexibility analysis (FRFA), we state that small entities may be affected by the designation; however, there is no indication that those affected by the designation would be limited to, nor disproportionately comprised of, small entities. Only those small entities that receive Federal funding or authorization for their activity, which may affect critical habitat, would be affected. We specifically requested comment on

impacts to small entities but did not receive any information during the comment period to assist in refining our analysis presented in the IRFA.

Comment 54: Two commenters stated that the designation would negatively impact Federal projects that would need to be implemented in response to a major storm or hurricane, such as shoreline reconstruction and protection projects.

Response: Our ESA section 7 consultation regulations allow for an expedited procedure for consulting on projects under emergency circumstances (50 CFR 402.05). If a Federal action in response to a hurricane were to affect designated critical habitat, we would comply with our regulations and consult as expeditiously as possible.

Comment 55: One commenter stated that we stated that tourism is not important to Puerto Rico.

Response: We believe the statement to which the commenter is referring is: "Tourism is not as important a component of Puerto Rico's overall economy as it is in [Florida and U.S.V.I.]." The economic baseline data summarized in the rule and the 4(b)(2) Report show that tourism-related industries account for the largest proportion of the economy in Florida and the U.S.V.I., whereas manufacturing accounts for the largest proportion of the economy in Puerto Rico. However, we acknowledge that tourism-related industries are within the top five sectors in Puerto Rico. While we believe our statement is correct, we further acknowledge the contribution of tourism to the economy of Puerto Rico.

Comment 56: Several commenters stated concerns that critical habitat would negatively impact fishing. One stated that closing off all waters from 0 to 30 m would not conserve the corals and would negatively impact fishing. Another commenter requested financial compensation for the economic impacts of the designation.

Response: Critical habitat does not create a closed fishing area. The designation of critical habitat for elkhorn and staghorn corals would not close the designated areas to fishing. The designation would require NMFS' Sustainable Fisheries Division to consult with NMFS' Protected Resources Division on Federally-managed fisheries that affect the critical habitat. As stated in the Draft 4(b)(2) Report, the only fisheries likely to affect the essential feature are those that use traps. Further, traps placed legally are not likely to affect the essential feature because they are not placed on corals or coral skeletons. However, traps may become mobilized during storm events

and interact with the dead-in-place skeleton portion of the essential feature, resulting in breakage and damage. In the 4(b)(2) Report, we identified gear maintenance as a potential project modification that may be implemented during consultation to reduce the impact of traps on the essential feature. The costs associated with this project modification would be fully co-extensive with the listing because loose traps can also break and damage the listed corals. Although we could not identify a specific monetary value associated with this potential project modification due to the variable number of traps, distance from shore, and price of fuel, it is likely that there would also be a benefit to the fishermen because traps would not be lost during storm events.

Comment 57: Several commenters stated that there are many activities that may affect critical habitat that do not receive Federal funding or authorization, or are not carried out by a Federal agency, and these activities should undergo ESA section 7 consultation. One commenter asked whether coastal habitat restoration projects and coastal bridge or roadway construction projects would require consultation.

Response: The commenters are correct that there may be activities that affect critical habitat that do not have a Federal nexus. These activities are not required to undergo ESA section 7 consultation. ESA section 7 only requires Federal agencies to ensure their activities do not destroy or adversely modify critical habitat. If a Federal restoration, bridge, or roadway construction project would affect the essential feature within designated critical habitat, the Federal agency would be required to consult. There are no other regulatory requirements pertaining to critical habitat in the ESA.

Comment 58: Several commenters identified specific federally regulated activities occurring within the designated critical habitat areas that they believe require profound changes in order to promote recovery of the threatened corals, such as open ocean outfalls and beach renourishment projects.

Response: The designation will allow us to review Federal projects that may affect the essential feature through interagency consultation pursuant to ESA section 7. Further, we are currently conducting consultations on Federal projects that may affect the threatened corals. A Federal agency's responsibility to consult with us is triggered by the listing of a species and proposal of an action that may affect such species;

therefore, we have been consulting on projects since the species were listed in May 2006. This rule allows us to consult on Federal projects that affect the essential feature within critical habitat. Project modifications implemented as a result of the consultation process will reduce project impacts and help promote recovery of these species.

Comment 59: One commenter stated that ongoing and proposed projects should undergo consultation for critical habitat. A second commenter asked, if a project changed, such as the size of a pipeline, would it have to be reviewed again?

Response: Once this designation becomes effective, all Federal actions that may affect the essential feature within critical habitat must undergo section 7 consultation. If there is an ongoing Federal action that has already completed consultation for listed species or other designated critical habitats and for which ongoing Federal involvement or control is retained, the consultation must be re-initiated if the action may affect critical habitat for the corals. Also, if such a Federal action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, consultation must be reinitiated (50 CFR 402.16).

Comment 60: One commenter requested clarification on how the designation will affect the implementation of the Monroe County Comprehensive Plan to improve water quality conditions in the Florida Keys, the establishment of binding treatment and disposal requirements, and implementation of the Total Maximum Daily Load (TMDL) Program.

Response: Without further details, it is not possible to determine the impact of the critical habitat designation on the referenced programs. However, in our 4(b)(2) Report, we identify discharges to navigable waters and establishment or revision of water quality standards, NPDES permits, and TMDLs as activities that may affect critical habitat. If any of the programs referenced by the commenter require Federal authorization or funding, or are carried out by a Federal agency and may affect the essential feature, then the Federal agency must conduct a section 7 consultation for effects on the designated critical habitat.

Comment 61: One commenter requested we identify the criteria used to assess whether a project may cause destruction or adverse modification (DAM) of critical habitat.

Response: We do not believe that specific DAM criteria can be identified

in this rule. Rather, that analysis is necessarily dependent on the particular facts and circumstances of an individual project's effects on critical habitat. Each project is analyzed individually, and consultation must assess the effects of that particular situation, including the environmental baseline and cumulative effects at the time of consultation. Because the defined critical habitat feature is essential to the listed corals' conservation, a DAM analysis will evaluate whether a project's impacts would impede or diminish the critical habitat's ability to facilitate the recovery of the species.

Comment 62: One commenter requested an explicit statement as to when the designation and the ESA section 7 consultation requirement would become effective.

Response: As stated in the DATES section of this rule, the final designation and all related requirements become effective December 26, 2008.

Comment 63: We received multiple comments, along with supporting data, from one commenter located in northern Palm Beach County regarding specific economic impacts that the designation would have on that commenter.

Response: For the reasons described in the response to Comment 17, we have modified the boundary of the proposed Florida area. The boundary has moved south and no longer encompasses the geographic area discussed by this commenter.

Comment 64: One commenter expressed concern that, because critical habitat surrounds the entire island of Puerto Rico, it will seriously hamper many kinds of maritime commerce, recreation, and subsistence activities.

Response: As stated in the response to several comments, the economic impact of critical habitat is solely a result of administrative and project modification costs of ESA section 7 consultation on Federal activities. The designation does not establish a closed area or prohibit any specific activities. See responses to Comments 43, 45, 46, 55, and 56 regarding the effect of the designation on vessel operation, recreation, and fishing activities.

Comments on National Security Impacts

Comment 65: The Navy stated that the Final Naval Air Station Key West (NASKW) Integrated Natural Resources Management Plan (INRMP) now demonstrates a conservation benefit to elkhorn and staghorn corals and requested critical habitat not be designated on those areas adjacent to NASKW properties under ESA section 4(a)(3)(B). The Navy also requested that

the Restricted Anchorage Area (RAA), defined in 33 CFR 334.580 and used by the South Florida Testing Facility (Naval Surface Warfare Center, Carderock Division), Dania, FL, also be excluded due to national security impacts pursuant to ESA section 4(b)(2). The RAA contains underwater cables that enable real-time data acquisition from Navy sensor systems used in Navy exercises.

Response: We appreciate the Navy developing an INRMP which includes a benefit to elkhorn and staghorn corals. Section 4(a)(3)(B)(i) of the ESA states that we may not designate 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 INRMP prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. The ESA further states that this provision does not affect the requirement to consult under section 7(a)(2) nor does it affect the obligation of the DOD to comply with section 9. The legislative history for this provision further explains:

"The conferees would expect the Secretary of the Interior to assess an INRMP's potential contribution to species conservation, giving due regard to those habitat protection, maintenance, and improvement projects and other related activities specified in the plan that address the particular conservation and protection needs of the species for which critical habitat would otherwise be proposed" (Conference Committee report, 149 Cong. Rec. H. 10563 (November 6, 2003))."

The NASKW INRMP covers the lands and waters - generally out to 50 yards (45.7 m) - adjacent to NASKW, including several designated restricted areas. As detailed in Appendix C of the INRMP, the plan provides benefits to elkhorn and staghorn corals through the following NASKW programs and activities: (1) erosion control; (2) Boca Chica Clean Marina Designation; (3) stormwater quality improvements; and (4) wastewater treatment. These activities provide a benefit to the species and the identified essential feature in the critical habitat designation by reducing sediment and nutrient discharges into nearshore waters, and this addresses the particular conservation and protection needs that critical habitat will afford. Further, the INRMP includes provisions for monitoring and evaluation of conservation effectiveness, which will

ensure continued benefits to the species. On June 26, 2008, we determined that the INRMP provides a benefit to the two corals; thus we are not designating critical habitat within the boundaries covered by the INRMP pursuant to Section 4(a)(3)(B) of the ESA.

We revised our 4(b)(2) Report to reflect the NASKW areas not being designated as a result of the INRMP. Further, as described in the previous response to comments on the boundaries of the designation, we have made several revisions to the boundaries of the Florida area, which removed all other areas of NASKW from the designation. As discussed later in this rule and in the Final 4(b)(2) Report, the Dania RAA, defined in 33 CFR 333.550, will be added to the areas excluded on the basis of national security impacts.

Comment 66: One commenter asked whether the former DOD sites around Puerto Rico and the U.S.V.I. were excluded from the designation.

Response: No. The referenced sites are no longer military installations under the control of the DOD and subject to an INRMP. There were also no identifiable national security impacts associated with these sites and this critical habitat designation.

Comment 67: One commenter requested U.S. Highway 1 and its bridges be excluded from critical habitat on the basis of national security.

Response: As stated in the response to previous comments, existing Federally authorized or maintained structures, including bridges, do not provide the feature essential to the conservation of elkhorn and staghorn corals. Therefore, the road and bridges along U.S. Highway 1 are not included in the designation.

Comment 68: One commenter stated that the DOD exclusions for "readiness areas" is a vague designation that the DOD uses to keep large areas unprotected under the broad "national security" categorization. The commenter suggested that DOD prepare an EIS on the designation of these areas, or be required to consult. Another commenter suggested that we and DOD consider whether military activities could be performed in areas not in critical habitat.

Response: Based on information provided to us by the Navy, national security interests would be negatively impacted by designation of the Dania RAA area because the potential additional consultations and project modifications to avoid adversely modifying the essential feature would interfere with military training and readiness. The Navy is the best

authority to determine the effect the designation will have on national security within those areas where their activities occur. Neither the ESA nor NEPA requires the development of an EIS to support that determination. Furthermore, the overall area excluded from critical habitat because of national security impacts has been reduced from approximately 47 sq miles (121 sq km) in the proposed rule to approximately 5.5 sq miles (14.2 sq km) in this final rule. The reduction is a result of revision of the boundaries of the Florida area as described in the response to previous comments and elsewhere in the preamble, the finalization of the NASKW INRMP, and the additional exclusion of the RAA for the South Florida Testing Facility.

Comments on Existing Regulations Protecting Threatened Corals' Habitat

Comment 69: One commenter stated that the East End Marine Park and Buck Island Reef National Monument in St. Croix, U.S.V.I., already protect elkhorn corals. Another commenter suggested that elkhorn and staghorn corals are more appropriately protected by other existing regulations such as the MSA.

Response: We recognize that elkhorn coral and its habitat, found within the boundaries of East End Marine Park and Buck Island Reef National Monument, are protected by the regulations and management plans for these areas. We also realize that the St. Croix Unit of critical habitat for both threatened elkhorn and staghorn corals encompasses the whole of both of these protected areas. Historical data and current GIS data indicate that St. Croix has coral reef and colonized hardbottom not just within the protected areas named, but in areas surrounding the entire island. Based on these data, we believe that the entire St. Croix Unit provides the feature essential to the conservation of threatened corals, and designation of this unit as critical habitat will contribute to the key conservation objective of facilitating increased incidence of successful sexual and asexual reproduction.

Additionally, as discussed previously, the designation of critical habitat does not set up a closed area, preserve, or refuge. It does require Federal agencies to ensure that their actions are not likely to result in the destruction or adverse modification of critical habitat. Given the potential number and types of future ESA section 7 consultations, we expect that the designation will prevent adverse effects to the essential feature contained not only within East End Marine Park and Buck Island Reef National Monument, but throughout the

entire St. Croix Unit. We believe the additional layer of protection provided by the designation of critical habitat will assist in preventing further losses of the feature and, eventually, will increase abundance of the two species. Last, we also describe in our 4(b)(2) Report that the critical habitat designation will provide an important and unique benefit to the corals by protecting settling substrate for future coral recruitment and recovery, compared to existing laws and management plans for these areas that focus on protecting existing coral resources.

Comments on Enforcement of the Designation

Comment 70: Several commenters expressed concerns about the enforcement and monitoring of areas designated as critical habitat for elkhorn and staghorn corals. One commenter stated that the designation would burden the U.S. Coast Guard with more duties, including patrolling within critical habitat areas.

Response: As stated in the proposed rule, the primary impacts of a critical habitat designation result from the ESA section 7(a)(2) requirement that Federal agencies ensure their actions are not likely to result in the destruction or adverse modification of critical habitat. Federal agencies whose projects may affect critical habitat must consult with NMFS to analyze potential impacts of the proposed action to each PCE, and to determine whether modifications to such actions are necessary. Examples of Federal agency actions that may trigger consultation under Section 7 of the ESA and of potential project modifications are provided in the Final 4(b)(2) Report for this rule.

Furthermore, a critical habitat designation does not result in the creation of closed areas, preserves, or refuges. There are no individual prohibitions on any activities within critical habitat. The transit of ships through or anchoring of ships in areas designated as critical habitat is not prohibited under the ESA. Existing pipelines within designated critical habitat are also unaffected by this rule. Therefore, the designation of critical habitat does not result in additional enforcement responsibilities for any local, state, or Federal law enforcement agencies, including the U.S. Coast Guard.

Other Comments

We received many helpful comments of an editorial nature. These comments noted inadvertent errors in the proposed rule and offered non-substantive but nonetheless clarifying changes to

wording. We have incorporated these editorial comments in the final rule. As these comments do not result in substantive changes to this final rule, we have not detailed the changes made.

In addition to the specific comments detailed above relating to the proposed critical habitat rule, the following comments were also received: (1) general support for the proposed rule and (2) peer-reviewed journal articles regarding threats to the species and their habitat. After careful consideration, we conclude the additional articles received were considered previously or did not pertain to the determination to designate critical habitat for elkhorn and staghorn corals.

Summary of Changes From the Proposed Critical Habitat Designation

Based on the comments received, we have made several substantive changes to the proposed rule:

1. The definition of the essential feature is revised to "substrate of suitable quality and availability to support larval settlement and recruitment, and reattachment and recruitment of asexual fragments."
2. The definition of "substrate of suitable quality and availability" has been modified to "natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover."
3. The boundaries and size of the Florida area have been modified. We proposed approximately 3,301 sq miles (8,550 sq km), but based on comments received, we are designating 1,329 sq miles (3,442 sq km) to more accurately reflect the specific areas that contain the essential feature. The reduction in the area resulted from: (a) moving the northern boundary south to Boynton Inlet, Palm Beach County; (b) moving the shoreward boundary to the 6-ft (1.8 m) contour from Boynton Inlet to Government Cut, Miami-Dade County; (c) moving the shoreward boundary to MLW in all other areas; (d) using the SAFMC boundary; and (e) removing the area between Boca Grande Key and the Dry Tortugas.
4. The areas covered by the INRMP for NASKW are not being designated as critical habitat.
5. The RAA, Dania, FL, is the only DOD installation being excluded from critical habitat due to national security impacts.
6. Twelve existing federally authorized channels and harbors are being explicitly not included in this final rule for greater clarity. The proposed rule stated that maintained channels do not provide the essential feature.

Critical Habitat Identification and Designation

Critical habitat is defined by section 3 of the ESA (and further by 50 CFR 424.02(d)) 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 1533 of this title, 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 protection; 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 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.”

Geographical Areas Occupied by the Species

The best scientific data available show the current geographical area occupied by both elkhorn and staghorn corals has remained unchanged from their historical ranges. In other words, there is no evidence of range constriction for either species. “Geographical areas occupied” in the definition of critical habitat is interpreted to mean the range of the species at the time of listing and not every discrete location on which individuals of the species physically are located (45 FR 13011; February 27, 1980). In general, elkhorn and staghorn corals have the same distribution, with few exceptions, and are widely distributed throughout the Caribbean. The Status of Coral Reefs in the Western Atlantic: Results of Initial Surveys, Atlantic and Gulf Rapid Reef Assessment (AGRRA) Program (Lang, 2003) provides results (1997–2004) of a regional systematic survey of corals, including *Acropora* spp., from many locations throughout the Caribbean. AGRRA data (1997–2004) indicate that the historic range of both species remains intact; staghorn coral is rare throughout the range (including areas of previously known dense occurrence), and elkhorn coral occurs in moderation. We also collected data and information pertaining to the geographical area occupied by these species at the time of listing by partnering with our SEFSC, NOAA National Centers for Coastal Ocean Science Biogeography Team, and the U. S. Geological Survey of the Department of the Interior. These partnerships resulted in the collection of GIS and remote sensing data (e.g., benthic habitat data, water depth, and presence/absence location data for

Acropora spp. colonies), which we supplemented with relevant information collected from the public during comment periods and workshops held throughout the ESA listing and critical habitat designation process.

In Southeast Florida, staghorn coral has been documented along the east coast as far north as Palm Beach County in deeper (16 to 30 m) water (Goldberg, 1973) and is distributed south and west throughout the coral and hardbottom habitats of the Florida Keys (Jaap, 1984), through Tortugas Bank. The northernmost occurrence of staghorn coral is at 26°31′27.2″ N, 80° 1′54.6″ W (CPE, pers. obs.). Elkhorn coral has been reported as far north as Broward County, with significant reef development and framework construction by this species beginning at Ball Buoy Reef in Biscayne National Park, extending discontinuously southward to the Dry Tortugas. The northernmost occurrence of elkhorn coral is at 26° 13′38.4″ N, 80° 4′57.6″ W (K. Banks, pers. obs.).

In Puerto Rico, elkhorn and staghorn corals have been reported in patchy abundance around the main island and isolated offshore locations. In the late 1970s, both elkhorn and staghorn corals occurred in dense and well developed thickets on many reefs off the north, northeast, east, south, west, and northwest coasts, and also the offshore islands of Mona, Vieques, and Culebra (Weil *et al.*, unpublished data). Dense, high profile, monospecific thickets of elkhorn and staghorn corals have been documented in only a few reefs along the southwest shore of the main island and isolated offshore locations (Weil *et al.*, unpublished data), though recent monitoring data for the presence of coral are incomplete in coverage around the islands. Further, the species have been recently documented along the west (e.g., Rincon) and northeast coasts (e.g., La Cordillera). Additionally, large stands of dead elkhorn currently exist on the fringing coral reefs along the south shoreline (e.g., Punta Picua, Punta Miquillo, Rio Grande, Guanica, La Parguera, Mayaguez). Although previously thought to be rare on the north shore of Puerto Rico, recently discovered reefs along the north coast of the main island also support large thickets of elkhorn coral (Hernandez, unpublished data).

The U.S.V.I. also supports populations of elkhorn and staghorn corals, particularly at Buck Island Reef National Monument. St. Croix has coral reef and colonized hard bottom surrounding the entire island. Data from the 1980s indicate that the species were present along the north, eastern, and

western shores at that time. The GIS data we compiled indicate the presence of elkhorn and staghorn corals currently along the north, northeastern, south, and southeastern shores of St. Croix. Monitoring data are incomplete, and it is possible that unrecorded colonies are present along the western, northwestern, or southwestern shores. For the islands of St. Thomas, there are limited GIS presence data available for elkhorn and staghorn corals. However, Grober-Dunsmore *et al.* (2006) show that from 2001–2003, elkhorn colonies were distributed in many locations around the island of St. John. GIS data and several reports identify the location of elkhorn colonies around the north and south coasts of the island of St. John (e.g., Rogers *et al.*, 2007). Additionally, the data we have indicate coral reef and coral-colonized hard bottom surrounding each of these islands as well as the smaller offshore islands. Again, it is possible that unrecorded colonies are present in these areas.

Navassa Island is a small, uninhabited, oceanic island approximately 50 km off the southwest tip of Haiti managed by U.S. Fish and Wildlife Service (FWS) as one component of the Caribbean Islands National Wildlife Refuge (NWR). Both acroporid species are known from Navassa, with elkhorn apparently increasing in abundance and staghorn rare (Miller and Gerstner, 2002).

Last, there are two known colonies of elkhorn at the Flower Garden Banks National Marine Sanctuary (FGBNMS), located 100 mi (161 km) off the coast of Texas in the Gulf of Mexico. The FGBNMS is a group of three areas of salt domes that rise to approximately 15 m water depth and are surrounded by depths from 60 to 120 m. The FGBNMS is regularly surveyed, and the two known colonies, which were only recently discovered and are considered to be a potential range expansion, are constantly monitored.

Our regulations at 50 CFR 424.12(h) state: “Critical habitat shall not be designated within foreign countries or in other areas outside of United States jurisdiction.” Although the geographical area occupied by elkhorn and staghorn corals includes coastal waters of many Caribbean and Central and South American nations, we are not including these areas for designation. The geographical area occupied by listed coral species which is within the jurisdiction of the United States is therefore limited to four counties in the State of Florida (Palm Beach County, Broward County, Miami-Dade County, and Monroe County), FGBNMS, and the

U.S. territories of Puerto Rico, U.S.V.I. and Navassa Island.

Physical or Biological Features Essential for Conservation (Primary Constituent Elements)

Within the geographical area occupied, critical habitat consists of specific areas on which are found those physical or biological features essential to the conservation of the species (hereafter also referred to as essential features). Section 3 of the ESA (16 U.S.C. 1532(3)) defines the terms "conserve," "conserving," and "conservation" to mean: "to use, and the use of, all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary." Further, our regulations at 50 CFR 424.12(b) for designating critical habitat state that physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection may include, but are not limited to: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally, (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. These regulations state that we shall focus on essential features within the specific areas considered for designation.

As stated in the Atlantic *Acropora* Status Review Report (*Acropora* Biological Review Team, 2005):

[T]here are several implications of the current low population sizes of *Acropora* spp. throughout much of the wider Caribbean. First, the number of sexual recruits to a population will be most influenced by larval availability, recruitment, and early juvenile mortality. Because corals cannot move and are dependent upon external fertilization in order to produce larvae, fertilization success declines greatly as adult density declines; this is termed an Allee effect (Levitan 1991). To compound the impact, *Acropora* spp., although hermaphroditic, do not effectively self-fertilize; gametes must be outcrossed with a different genotype to form viable offspring. Thus, in populations where fragmentation is prevalent, the effective density (of genetically distinct adults) will be even lower than colony density. It is highly likely that this type of recruitment limitation (Allee effect) is occurring in some local elkhorn and staghorn populations, given their state of drastically reduced abundance/density. Simultaneously,

when adult abundances of elkhorn and staghorn corals are reduced, the source for fragments (to provide for asexual recruitment) is also compromised. These conditions imply that once a threshold level of population decline has been reached (i.e., a density where fertilization success becomes negligible) the chances for recovery are low.

Thus, we determined that based on available information, facilitating increased incidence of successful sexual and asexual reproduction is the key objective to the conservation of these species. We then turned to determining the physical or biological features essential to this conservation objective.

Currently, sexual recruitment of elkhorn and staghorn corals is limited in some areas and absent in most locations studied. Compounding the difficulty of documenting sexual recruitment is the difficulty of visually distinguishing some sexual recruits from asexual recruits (Miller *et al.*, 2007). Settlement of larvae or attachment of fragments is often unsuccessful, given limited amounts of appropriate habitat due to the shift in benthic community structure from coral-dominated to algae-dominated that has been documented since the 1980s (Hughes and Connell, 1999). Appropriate habitat for elkhorn and staghorn coral recruits to attach and grow consists of natural consolidated hard substrate. In addition to being limited, the availability of appropriate habitat for successful sexual and asexual reproduction is susceptible to becoming reduced further because of such factors as fleshy macroalgae overgrowing and preempting the space available for larval settlement, fragment reattachment, and recruitment. Similarly, sediment accumulating on suitable substrate impedes sexual and asexual reproductive success by preempting available substrate and smothering coral recruits. Also preempting space and exacerbating the effect of sedimentation is the presence of turf algae, which traps the sediment, leading to greater amounts of accumulations compared to bare substrate alone. As described above, features that will facilitate successful larval settlement and recruitment, and reattachment and recruitment of asexual fragments, are essential to the conservation of elkhorn and staghorn corals. Without successful recruits (both sexual and asexual), the species will not increase in abundance, distribution, and genetic diversity.

Elkhorn and staghorn corals, like most corals, require natural consolidated hard substrate (i.e., attached, dead coral skeleton or hardbottom) for their larvae to settle or fragments to reattach. The type of substrate available directly influences settlement success and

fragment survivorship. Lirman (2000) demonstrated this in a transplant experiment using elkhorn coral fragments created by a ship grounding. Fifty fragments were collected within 24 hours of fragmentation and assigned to one of the following four types of substrate: (1) hardbottom (consolidated carbonate framework), (2) rubble (loose, dead pieces of elkhorn and staghorn corals), (3) sand, and (4) live coral. The results showed that the survivorship of transplanted fragments was significantly affected by the type of substrate, with fragment mortality being the greatest for those transplanted to sandy bottom (58 percent loss within the first month and 71 percent after 4 months). Fragments placed on live adult elkhorn coral colonies fused to the underlying tissue and did not experience any tissue loss; and fragments placed on rubble and hardbottom substrates showed high survivorship.

Unlike fragments, coral larvae cannot attach to living coral (Connell *et al.*, 1997). Larvae can settle and attach to dead coral skeleton (Jordan-Dahlgren, 1992; Bonito and Grober-Dunsmore, 2006) and may settle in particular areas in response to chemical cues from certain species of crustose coralline algae (CCA) (Morse *et al.*, 1996; Heyward and Negri, 1999; Harrington and Fabricius, 2004). The recent increase in the dominance of fleshy macroalgae as major space-occupiers on many Caribbean coral reefs impedes the recruitment of new corals. This shift in benthic community structure (from the dominance of stony corals to that of fleshy algae) on Caribbean coral reefs is generally attributed to the greater persistence of fleshy macroalgae under reduced grazing regimes due to human overexploitation of herbivorous fishes (Hughes, 1994) and the regional mass mortality of the herbivorous long-spined sea urchin in 1983–84. Further, impacts to water quality (principally nutrient input) coupled with low herbivore grazing are also believed to enhance fleshy macroalgal productivity. Fleshy macroalgae are able to colonize dead coral skeleton and other available substrate, preempting space available for coral recruitment.

The persistence of fleshy macroalgae under reduced grazing regimes has impacts on CCA growth, which may reduce settlement of coral larvae, as CCA is thought to provide chemical cues for settlement. Most CCA are susceptible to fouling by fleshy algae, particularly when herbivores are absent (Steneck, 1986). Patterns observed in St. Croix, U.S.V.I., also indicate a strong positive correlation between CCA abundance and herbivory (Steneck,

1997). A study in which Miller *et al.* (1999) used cages to exclude large herbivores from the study site resulted in increased cover of both turf algae and macroalgae, and cover of CCA decreased. The response of CCA to the experimental treatment persisted for 2 months following cage removal (Miller *et al.*, 1999). Additionally, following the mass mortality of the urchin *Diadema antillarum*, significant increases in cover of fleshy and filamentous algae occurred with parallel decreases in cover of CCA (de Ruyter van Steveninck and Bak, 1986; Liddel and Ohlhorst, 1986). The ability of fleshy macroalgae to affect growth and survival of CCA has indirect, yet important, impacts on the ability of coral larvae to successfully settle and recruit.

Several studies show that coral recruitment tends to be greater when algal biomass is low (Rogers *et al.*, 1984; Hughes, 1985; Connell *et al.*, 1997; Edmunds *et al.*, 2004; Birrell *et al.*, 2005; Vermeij, 2006). In addition to preempting space for coral larvae settlement, many fleshy macroalgae produce secondary metabolites with generalized toxicity, which also may inhibit settlement of coral larvae (Kuffner and Paul, 2004; Kuffner, 2006). Furthermore, algal turfs can trap sediments (Eckman *et al.*, 1989; Kendrick, 1991; Steneck, 1997; Purcell, 2000; Nugues and Roberts, 2003; Wilson *et al.*, 2003; Purcell and Bellwood, 2001), which then creates the potential for algal turfs and sediments to act in combination to hinder coral settlement (Nugues and Roberts, 2003; Birrell *et al.*, 2005). These turf algae sediment mats also can suppress coral growth under high sediment conditions (Nugues and Roberts, 2003) and may gradually kill the marginal tissues of stony corals with which they come into contact (Dustan, 1977, 1999, as cited by Roy, 2004).

Sediments enter the reef environment through many processes that are natural or anthropogenic in origin, including erosion of 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.*, 2003). Accumulation of sediment can smother living corals, dead coral skeleton, and exposed hard substrate. Sediment accumulation on dead coral skeletons and exposed hard substrate reduces the amount of available substrate suitable for coral larvae settlement and fragment reattachment (Rogers, 1990; Babcock and Smith, 2002). 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 not survive (Te, 1992). Sedimentation, therefore, impacts the health and survivorship of all life stages (i.e., fecund adults, fragments, larvae, and recruits) of elkhorn and staghorn corals.

Based on the key conservation objective we have identified to date, the natural history of elkhorn and staghorn corals, and their habitat needs, the physical or biological feature of elkhorn and staghorn corals' habitat essential to their conservation is substrate of suitable quality and availability to support successful larval settlement and recruitment, and reattachment and recruitment of fragments. For purposes of this definition, "substrate of suitable quality and availability" means natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover. This feature is essential to the conservation of these two species due to the extremely limited recruitment currently being observed.

We determined that no other facets of the environment are appropriate or necessary for defining critical habitat for the two corals. Other than the substrate essential feature, we cannot conclude there is any other sufficiently definable feature of the environment that is essential to the corals' conservation. Water temperature and other aspects of water quality are more appropriately viewed as sources of impacts or stressors that can harm the corals, rather than habitat features that provide a conservation function. These stressors would therefore be analyzed as factors that may contribute to a jeopardy determination pursuant to section 7 of the ESA, rather than to a determination whether the corals' critical habitat is likely to be destroyed or adversely modified. Some environmental features are also subsumed within the definition of the substrate essential feature; for instance, substrate free from fleshy or turf macroalgal cover would encompass water quality sufficiently free of nutrients.

Specific Areas Within the Geographical Area Occupied by the Species

The definition of critical habitat further instructs us to identify specific areas on which are found the physical or biological features essential to the species' conservation. Our regulations state that critical habitat will be 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)). As discussed below, we determined that specific areas in FGBNMS and Navassa National Wildlife Refuge that contain the essential feature do not otherwise meet the definition of critical habitat. Hence, in this section we only describe our identification of the specific areas we included in this designation.

In addition to information obtained from the public, we partnered with SEFSC, NOAA Biogeography Team, and U.S. Geological Survey to obtain GIS and remote sensing data (e.g., benthic habitat data, water depth) to compile existing data to identify and map areas that may contain the identified essential feature. NOAA's National Ocean Service (NOS) and the Florida Fish and Wildlife Research Institute completed The Benthic Habitat Mapping of Florida Coral Reef Ecosystems using a series of 450 aerial photographs collected in 1991–1992. For this mapping effort, coral ecosystem ecologists outlined the boundaries of specific habitat types by interpreting color patterns on the photographs. Benthic habitats were classified into four major categories - corals, seagrasses, hardbottom, and bare substrate - and 24 subcategories, such as sparse seagrass and patch reef. Each habitat type was groundtruthed in the field by divers to validate the photo-interpretation of the aerial photography. Habitat boundaries were georeferenced and digitized to create computer maps. A similar method was followed by NOS using 1999 aerial imagery in developing the Benthic Habitat Mapping of Puerto Rico and the U.S.V.I.

Using GIS software, we extracted all areas that could be considered potential recruitment habitat, including hardbottom and coral. The benthic habitat information assisted in identifying any major gaps in the distribution of the substrate essential feature. Given uncertainties in the age and resolution of the data, we were unable to identify smaller, discrete specific areas that contained the essential feature. We concluded that, based upon the best available information, although the essential feature is unevenly dispersed throughout the ranges of the species, all identified areas contained the essential feature. However, based upon information submitted during the public comment period, we were able to refine the proposed designation to remove gaps in the distribution of the essential feature and limit the final designation more precisely to areas that contain the essential feature.

The areas eliminated are those nearshore surf zones along the southeast coast of Florida and the area between Boca Grande Key and the Dry Tortugas in Florida. We further limited the specific areas to the maximum depth of occurrence of the two corals (i.e., 30 m or 98 ft). The 98-ft (30 m) contour was extracted from the National Geophysical Data Center Coastal Relief Model for Puerto Rico & Virgin Islands, and Florida. Because Puerto Rico and the U.S.V.I. are islands, the contours yielded continuous closed polygons. However, because the two species only occur off specific counties in Florida, we used additional boundaries to close the polygons. As previously stated in the response to comments, the northern boundary of critical habitat was shifted south to Boynton Inlet, Palm Beach County (26°32'42.5" N) to more accurately reflect the occupied range of the species. Additionally, the nearshore surf zones of Palm Beach, Broward, and Miami-Dade Counties are areas with high sediment movement, suspension, and deposition levels. Hard substrate areas found within these nearshore surf zones are ephemeral in nature and are frequently covered by sand, thus not meeting the definition of the essential feature. Therefore, from Boynton Inlet, Palm Beach County, to Government Cut, Miami-Dade County, the inshore boundary of critical habitat is the 6-foot (1.8 m) contour. Government Cut was identified as the southernmost boundary of where there were no occurrences of either species in less than 6 feet (1.8 m) of water. There are occurrences of the species in less than 6 feet (1.8 m) of water south of Government Cut, thus indicating that hydrodynamic conditions are suitable for recruitment. Therefore, from Government Cut south along the Florida Keys, the inshore boundary is the MLW line, the COLREGS line, or the South Atlantic Fishery Management Council boundary. These three boundaries together create a continuous line separating the marine waters of the South Atlantic from land, inshore waters, or the Gulf of Mexico. Lastly, as previously stated in the response to comments, the area between 82° W and 82° 45' W longitude does not provide the essential feature and is omitted from the designation. The waters surrounding the Dry Tortugas, shallower than 98 feet (30 m) and bounded on the east side by 82° 45' W longitude are included in the designation because both the species and essential feature are present. In all areas the seaward boundary is the 98-ft (30 m) contour.

Using the above procedure and consistent with our regulations (50 CFR 424.12(c)), we identified four "specific areas," including a few small adjacent areas separated from main areas by water depth greater than 98 ft (30 m), within the geographical area occupied by the species at the time of listing, that contain the essential feature. These areas comprise all waters in the depths of 98 ft (30 m) and shallower to: (1) the 6-ft (1.8 m) contour from Boynton Inlet, Palm Beach County, to Government Cut, Miami-Dade County; and the MLW line from Government Cut south to 82° W longitude in Monroe Counties; and the MLW line surrounding the Dry Tortugas, Florida; (2) the MLW line in Puerto Rico and associated Islands; (3) the MLW line in St. John/St. Thomas, U.S.V.I.; and (4) the MLW line in St. Croix, U.S.V.I. (see maps).

Within these specific areas, the essential feature consists of natural consolidated hard substrate or dead coral skeleton that are free from fleshy or turf macroalgae cover and sediment cover. The essential feature can be found unevenly dispersed throughout these four areas due to differential macroalgae coverage and naturally occurring unconsolidated sediment and seagrasses dispersed within the reef ecosystem. A larger number of smaller specific areas could not be identified because the submerged nature of the essential feature, the limits of available information on the distribution of the essential feature, and limits on mapping methodologies make it infeasible to define the specific areas containing the essential feature more finely than described herein. Further, based on data about their historical distributions, the corals are capable of successfully recruiting and attaching to available substrate anywhere within the boundaries of the four specific areas. Given these species' reduced abundances, the four specific areas were identified to include all available potential settling substrate within the 98-ft (30 m) contour to maximize the potential for successful recruitment and population growth.

Natural sites covered with loose sediment, fleshy or turf macroalgal covered hard substrate, or seagrasses do not provide the essential feature for elkhorn and staghorn corals. Additionally, all existing (meaning constructed at the time of this critical habitat designation) federally authorized or permitted man-made structures such as aids-to-navigation (ATONs), artificial reefs, boat ramps, docks, pilings, channels, or marinas do not provide the essential feature that is essential to the species' conservation. Substrates within

the critical habitat boundaries that do not contain the essential feature are not part of the designation. Federal actions, or the effects thereof, limited to these areas do not trigger section 7 consultation under the ESA for coral critical habitat, unless they may affect the essential feature in adjacent critical habitat. As discussed here and in the supporting impacts analysis, given the precise definition of the essential feature, determining whether an action may affect the feature can be accomplished without entering into an ESA section 7 consultation.

Unoccupied Areas

ESA section 3(5)(A)(ii) further defines critical habitat to include specific areas outside the geographical area occupied if the areas are determined by the Secretary to be essential for the conservation of the species. Regulations at 50 CFR 424.12(e) specify that we shall designate as critical habitat areas outside the geographical area presently occupied by a species only when a designation limited to its present range would be inadequate to ensure the conservation of the species. At the present time, the range of these species has not been constricted, and we have not identified any areas outside the geographical area occupied by the species that are essential for their conservation. Therefore, we did not designate any unoccupied areas for elkhorn and staghorn corals.

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 physical or biological features that "may require special management considerations or protection." A few courts have interpreted aspects of this statutory requirement, and the plain language aids in its interpretation. For instance, the language clearly indicates the features, not the specific area containing the features, are the focus of the "may require" provision. Use of the disjunctive "or" also suggests the need to give distinct meaning to the terms "special management considerations" and "protection." Generally speaking, "protection" suggests actions to address a negative impact or threat of a negative impact. "Management" seems plainly broader than protection, and could include active manipulation of a feature or aspects of the environment. Two Federal district courts, focusing on the term "may," ruled that features can meet this provision based on either present requirements for special management considerations or

protections, or on possible future requirements. See *Center for Biol. Diversity v. Norton*, 240 F. Supp. 2d 1090 (D. Ariz. 2003); *Cape Hatteras Access Preservation Alliance v. DOI*, 344 F. Supp. 108 (D.D.C. 2004). The Arizona district court ruled that the provision cannot be interpreted to mean that features already covered by an existing management plan must be determined to require "additional" special management, because the term "additional" is not in the statute. Rather, the court ruled that the existence of management plans may be evidence that the features in fact require special management. *Center for Biol. Diversity v. Norton*, 1096–1100. NMFS' regulations define "special management considerations or protections" to mean "any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species" (50 CFR 424.02(j)).

Based on the above, we evaluated whether the essential feature may require special management considerations or protections by evaluating four criteria:

- (a) Whether there is presently a need to manage the feature;
- (b) Whether there is the possibility of a need to manage the feature;
- (c) Whether there is presently a negative impact on the feature; or
- (d) Whether there is the possibility of a negative impact on the feature.

In evaluating present or possible future management needs for the essential feature, we recognized that the feature in its present condition must be the basis for a finding that it is essential to the corals' conservation. In addition, the needs for management evaluated in (a) and (b) were limited to managing the feature for the conservation of the species. In evaluating whether the essential feature meets either criterion (c) or (d), we evaluated direct and indirect negative impacts from any source (e.g., human or natural). However, we only considered the criteria to be met if impacts affect or have the potential to affect the aspect of the feature that makes it essential to the conservation of the species. We then evaluated whether the essential feature met the "may require" provision separately for each of the four "specific areas" designated, as well as Navassa Island and FGBNMS (discussed later), as management and protection requirements can vary from area to area based on such factors as the legal authorities applicable to areas and the location of the area within the occupied range.

Suitable habitat available for larval settlement and recruitment, and asexual fragment reattachment and recruitment of these coral species is particularly susceptible to impacts from human activity because of the shallow water depth range (less than 98 ft (30 m)) in which elkhorn and staghorn corals commonly grow. The proximity of this habitat to coastal areas subject this feature to impacts from multiple activities, including, but not limited to dredging and disposal activities, stormwater run-off, coastal and maritime construction, land development, wastewater and sewage outflow discharges, point and non-point source pollutant discharges, fishing, placement of large vessel anchorages, and installation of submerged pipelines or cables. The impacts from these activities, combined with those from natural factors (e.g., major storm events), significantly affect the quality and quantity of available substrate for these threatened species to successfully sexually and asexually reproduce. We concluded that the essential feature is currently and will likely continue to be negatively impacted by some or all of these factors in all four specific areas.

Overfishing of herbivorous fishes and the mass die-off of long-spined sea urchin *Diadema antillarum* are considered two of the primary contributing factors to the recent shift in benthic community structure from the dominance of stony corals to that of fleshy macroalgae on Caribbean coral reefs. In the absence of fish and urchin grazing or at very low grazing pressures, coral larvae, algae, and numerous other epibenthic organisms settle in high numbers, but most young, developing coral larvae are rapidly outcompeted for space, and their mortality levels are high (Sammarco, 1985). The weight of evidence suggests that competition between algae and corals is widespread on coral reefs and is largely mediated by herbivory (McCook *et al.*, 2001).

An additional factor contributing to the dominance of fleshy macroalgae as major space-occupiers on many Caribbean coral reefs is nutrient enrichment. Nutrients are added to coral reefs from both point sources (readily identifiable inputs where pollutants are discharged to receiving surface waters from a pipe or drain) and non-point sources (inputs that occur over a wide area and are associated with particular land uses). Anthropogenic sources of nutrients include sewage, stormwater and agricultural runoff, river discharge, and groundwater; however, natural oceanographic sources like internal waves and upwelling also distribute nutrients on coral reefs. Coral reefs have

been considered to be generally nutrient-limited systems, meaning that levels of accessible nitrogen and phosphorus limit the rates of macroalgae growth. When nutrient levels are raised in such a system, growth rates of fleshy macroalgae can be expected to increase, and this can yield imbalance and changes in community structure.

The anthropogenic source routes for nutrients may also bring additional sediments into the coral reef environment. Sources of sediment include erosion of coastline, resuspension of bottom sediments, terrestrial run-off (following clearing of mangroves and deforestation of hillsides), beach renourishment, and nearshore dredging and disposal for coastal construction projects and for navigation purposes. Sediment deposition and accumulation affect the overall amount of suitable substrate available for larval settlement and recruitment, and fragment reattachment and recruitment (Babcock and Davies, 1991), and both sediment composition and deposition affect the survival of juvenile corals (Fabricius *et al.*, 2003).

A major category of habitat-related activities that may affect the essential feature for the two listed corals is water quality management. Activities within this category have the potential to negatively affect the essential feature for elkhorn and staghorn corals by altering the quality and availability of suitable substrate for larval settlement, recruitment, and fragment reattachment. Nutrient enrichment, via sewage, stormwater and agricultural runoff, river discharge, and groundwater, is a major factor contributing to this shift in benthic community structure and preemption of available substrate suitable for larval settlement, recruitment, and asexual fragment reattachment. Additionally, sedimentation resulting from land-use practices and from dredging and disposal activities in all four specific areas reduces the overall availability and quality of substrate suitable for successful sexual and asexual reproduction by the two acroporid corals. Thus, the essential feature currently needs and will likely continue to need special management or protection.

Although they fall within U.S. jurisdiction and may contain the essential feature, we are not including FGBNMS and Navassa National Wildlife Refuge in our critical habitat designation because we do not believe the essential feature in these areas requires special management considerations or protections. Both

FGBNMS and Navassa Island are remote marine protected areas and are not currently exposed to the negative impacts and conditions affecting the essential feature discussed for the other areas above. Additionally, based on available information, we do not expect the essential feature found within these two protected areas to experience negative impacts from human or natural sources that would diminish the feature's conservation value to the two coral species.

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 destroy or adversely modify such habitat or that may be affected by such designation. A wide variety of activities may affect critical habitat and, when carried out, funded, or authorized by a Federal agency, require an ESA section 7 consultation. These are discussed at length in the Final 4(b)(2) Report and summarized below. Such activities include, but are not limited to, dredging and disposal, beach renourishment, large vessel anchorages, submarine cable/pipeline installation and repair, oil and gas exploration, pollutant discharge, and oil spill prevention and response. Notably, all the activities identified that may affect the critical habitat may also affect the species themselves, if present within the action area of a proposed Federal action.

We believe this critical habitat designation provides Federal agencies, private entities, and the public with clear notification of critical habitat for elkhorn and staghorn corals and the boundaries of the habitat. This designation allows Federal agencies and others to evaluate the potential effects of their activities on critical habitat to determine if ESA section 7 consultation with NMFS is needed, given the specific definition of the essential feature above. Consistent with recent agency guidance on conducting adverse modification analyses (NMFS, 2005), at the time of consultation we will apply the statutory provisions of the ESA, including those in section 3 that define "critical habitat" and "conservation," to determine whether a proposed action is likely to result in the destruction or adverse modification of critical habitat.

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

Section 4(a)(3)(B) prohibits designating as critical habitat any lands or other geographical areas owned or controlled by the DOD, or designated for its use, that are subject to an INRMP, if

we determine that such a plan provides a benefit to the coral species (16 U.S.C. 1533(a)(3)(B)). The legislative history to this provision explains:

The conferees would expect the [Secretary] to assess an INRMP's potential contribution to species conservation, giving due regard to those habitat protection, maintenance, and improvement projects and other related activities specified in the plan that address the particular conservation and protection needs of the species for which critical habitat would otherwise be proposed. Consistent with current practice, the Secretary would establish criteria that would be used to determine if an INRMP benefits the listed species for which critical habitat would be proposed (Conference Committee report, 149 Cong. Rec. H. 10563; November 6, 2003).

At the time of the proposed designation, no areas within the specific areas proposed for designation were covered by relevant INRMPs. Since the publication of the proposed designation, NASKW finalized an updated INRMP. The NASKW INRMP covers the lands and waters - generally out to 50 yards (45.7 m) - adjacent to NASKW, including several designated restricted areas. As detailed in Appendix C of the INRMP, the plan provides benefits to elkhorn and staghorn corals through the following NASKW programs and activities: (1) erosion control; (2) Boca Chica Clean Marina Designation; (3) stormwater quality improvements; and (4) wastewater treatment. These activities provide a benefit to the species and the identified essential feature in the critical habitat designation by reducing sediment and nutrient discharges into nearshore waters, and this addresses the particular conservation and protection needs that critical habitat will afford. Further, the INRMP includes provisions for monitoring and evaluation of conservation effectiveness, which will ensure continued benefits to the species. On June 26, 2008, we determined that the INRMP provides a benefit to the two corals as described above. Thus, we are not designating critical habitat within the boundaries covered by the INRMP pursuant to Section 4(a)(3)(B) of the ESA.

Application of ESA Section 4(b)(2)

The foregoing discussion described the specific areas within U.S. jurisdiction that fall within the ESA section 3(5) definition of critical habitat in that they contain the physical feature essential to the corals' conservation that may require special management considerations or protection. Before

including areas in a designation, section 4(b)(2) of the ESA requires the Secretary to take into consideration the economic impact, impact on national security, and any other relevant impacts of designation of any particular area. Additionally, the Secretary has the discretion to exclude any area from designation if he determines 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 analysis of impacts below summarizes the comprehensive analysis contained in our Final Section 4(b)(2) Report, first by considering economic, national security, and other relevant impacts that we projected would result from including each of the four specific areas in the critical habitat designation. This consideration informed our decision on whether to exercise our discretion to exclude 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 to particular impacts.

The ESA does not define what "particular areas" means in the context of section 4(b)(2), or the relationship of particular areas to "specific areas" that meet the statute's definition of critical habitat. As there was no biological basis to subdivide the four specific critical habitat areas into smaller units, we treated these areas as the "particular areas" for our initial consideration of impacts of designation.

Impacts of Designation

The primary impacts of a critical habitat designation result from the ESA section 7(a)(2) requirement that Federal agencies ensure their actions are not likely to result in the destruction or adverse modification of critical habitat. 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 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 a modification would be required due to impacts to both the species and critical habitat, the impact of the designation may be co-extensive with the ESA listing of the species. Additional impacts of designation include state and local protections that may be triggered as a result of designation, and positive impacts that may arise from conservation of the species and their habitat, and education of the public to the importance of an area for species conservation.

A Final ESA 4(b)(2) Report describes the impacts analysis in detail (NMFS, 2008). The only substantive changes made to the Final Report in response to public comments are in the section regarding not designating critical habitat on DOD lands pursuant to 4(a)(3)(B) and the national security exclusions. The report describes the projected future Federal activities that would trigger ESA section 7 consultation requirements because they may affect the essential feature. Additionally, the report describes the project modifications we identified that may reduce impacts to the essential feature, and states whether the modifications are more likely to be solely a result of the critical habitat designation or co-extensive with another regulation, including the ESA listing of the species. The report also identifies the potential national security and other relevant impacts that may arise due to the critical habitat designation. This report is available on NMFS' Southeast Region website at <http://sero.nmfs.noaa.gov/pr/esa/Acropora.htm>.

Economic Impacts

As discussed above, economic impacts of the critical habitat designation 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 designation are described later.

Because elkhorn and staghorn corals are newly listed and we lack a lengthy consultation history for these species, we needed to make assumptions about the types of future Federal activities that might require section 7 consultation under the ESA. We examined the consultation record over the last 10 years, as compiled in our Public

Consultation Tracking System (PCTS) database, to identify types of Federal activities that have the potential to adversely affect elkhorn or staghorn coral critical habitat. We identified 13 categories of activities conducted by 7 Federal action agencies: Airport repair and construction; anchorages; construction of new aids to navigation; beach renourishment and bank stabilization; coastal construction; discharges to navigable waters; dredging and disposal; fishery management; maintenance construction; maintenance dredging and disposal; military installation management; resource management; and development or modification of water quality standards. Notably, all categories of projected future actions that may trigger consultation because they have the potential to adversely affect the essential feature also have the potential to adversely affect the corals themselves. There are no categories of activities that would trigger consultation on the basis of the critical habitat designation alone. However, it is feasible that a specific future project within a category of activity would have impacts on critical habitat but not on the species. Because the total surface area covered by the essential feature (although unquantified) is far larger than the total surface area on which the corals (again unquantified) currently occur, it is likely there will be more consultations with impacts on critical habitat than on the species. Nonetheless, it was impossible to determine how many of those projects there may be over the 10-year horizon of our impacts analysis.

To avoid underestimating impacts, we assumed that all of the projected future actions in these categories will require formal consultations for estimation of both administrative and project modification costs. This assumption likely results in an overestimation of the number of future formal consultations.

We next considered the range of modifications we might seek for these activities to avoid adverse modification of elkhorn and staghorn coral critical habitat. We identified 13 potential project modifications that we may require to reduce impacts to the essential feature through section 7 consultation under the ESA. To be conservative in estimating impacts, we assumed that project modifications would be required to address adverse effects from all projected future agency actions requiring consultation. Although we made the assumption that all potential project modifications would be required by NMFS, not all of the modifications identified for a specific

category of activity would be necessary for an individual project, so we were unable to identify the exact modification or combinations of modifications that would be required for all future actions.

We also identified whether a project modification would be required due to the listing of the species or another existing regulatory authority to determine if the cost of the project modification was likely to be co-extensive or incremental. Several project modifications (i.e., conditions monitoring, diver education, horizontal directional drilling (HDD), tunneling or anchoring cables and pipelines, sediment control measures, fishing gear maintenance, and water quality standard modification) were characterized as fully co-extensive with the listing of the species or other existing statutory or regulatory authority, because the nature of the actions that would require these modifications typically involve a large action area likely to include both the essential feature and either the listed corals or other coral reef resources. Other project modifications (i.e., project relocation, diver assisted anchoring or mooring buoy use, global positioning system (GPS) and dynamic positioning vessel (DPV) protocol, sand bypassing/backpassing, shoreline protection measures, and use of upland or artificial sources of sand) were characterized as partially co-extensive with the listing of the species or other existing statutory or regulatory authority such as the CWA because of the typically smaller action area of projects that would involve these modifications, and thus the greater likelihood that specific projects would impact only the essential feature. We did not identify any project modification that we expected would result in fully incremental costs due to the critical habitat designation.

Table 1 provides a summary of the estimated costs, where possible, of individual project modifications. The Final ESA 4(b)(2) Report provides a detailed description of each project modification, methods of determining estimated costs, and actions for which it may be prescribed. Although we have a projection of the number of future formal consultations (albeit an overestimation), the lack of information on specific project designs limits our ability to forecast the exact type and amount of modifications required. Thus, while the costs associated with types of project modifications were characterized, no total cost of this rule could be quantified.

TABLE 1. SUMMARY OF POTENTIAL PER-PROJECT COSTS ASSOCIATED WITH SPECIFIC PROJECT MODIFICATIONS. WHERE INFORMATION WAS AVAILABLE, RANGES OF SCOPES ARE INCLUDED.

Project Modification	Cost	Unit	Range	Approx. Totals per Project
Fully Co-extensive				
Conditions Monitoring	\$3.5-6K	per day	1-400 days	\$3.5K - 2.4M
Diver Education	Administrative cost	n/a	n/a	n/a
HDD/Tunneling	\$1.39 -2.44M	per mile	0.2 - 31.5 miles	\$278K -76.9M
Fishing Gear Maintenance	Cost of gas and time to retrieve traps. Ultimately a potential cost savings of reduction in lost traps.	n/a	n/a	n/a
Pipe Collars/Cable Anchoring	\$1,200	per anchor	13 - 2,529 anchors	\$15.6K - 3M
Sediment and Turbidity	-\$43K	per mile	0.05 - 7 miles	\$2-301K
Control Measures				
Water Quality Standard Modification	Undeterminable	n/a	n/a	n/a
Partially Co-extensive				
Project Relocation	Undeterminable	n/a	n/a	n/a
Diver Assisted Anchoring/ Mooring Buoy Use	\$300-1000	per day	n/a	n/a
GPS and DPV protocol	Undeterminable	n/a	n/a	n/a
Sand Bypassing/ Backpassing	\$1.5-16K	per cu yd	75-512K cu yds	\$113K-8.1M
Shoreline Protection Measures to Reduce Frequency of Beach Nourishment Events	Undeterminable but ultimately a potential cost savings	n/a	n/a	n/a
Upland or Artificial Sources of Sand	Undeterminable	n/a	n/a	n/a

In addition to project modification costs, administrative costs of consultation will be incurred by Federal agencies and project permittees or grantees as a result of this designation. Estimates of the cost of an individual consultation were developed from a review and analysis of the consultation database, as previously discussed, and from the estimated ESA section 7 consultation costs identified in the Economic Analysis of Critical Habitat Designation for the Gulf Sturgeon (IEC, 2003) inflated to 2007 dollars. In the proposed rule and Draft 4(b)(2) Report, costs were reported in 2006 dollars because the 2007 coefficient was not known. Cost figures are based on an average level of effort for consultations of low or high complexity (based on NMFS and other Federal agency information), multiplied by the appropriate labor rates for NMFS and

other Federal agency staff. Although the essential feature occurs in greater abundance than the corals and thus the probability that a consultation would be required because of the critical habitat designation is higher than for the listing of corals, we were unable to estimate the number of consultations that may be required on the basis of critical habitat alone. Therefore, we present the estimated maximum incremental administrative costs as averaging \$843,223 to \$1,664,824, annually. While the total area of the critical habitat designation has been reduced due to the modifications we have made to the boundaries, the data used in the projection of number of consultations can not be reduced from what was presented in the proposed rule. The smallest unit for which the consultation data exist is at the county level. No counties were removed from critical

habitat based on our boundary revisions. Thus, our administrative cost estimates are not modified from the proposed rule.

National Security Impacts

Previous critical habitat designations have recognized that impacts to national security result if a designation would trigger future ESA section 7 consultations because a proposed military activity "may affect" the physical or biological feature(s) essential to the listed species' conservation. Anticipated interference with mission-essential training or testing or unit readiness, either through delays caused by the consultation process or through expected requirements to modify the action to prevent adverse modification of critical habitat, has been identified as a negative impact of critical habitat designations.

(See, e.g., Proposed Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover, 71 FR 34571, June 15, 2006, at 34583; and Proposed Designation of Critical Habitat for Southern Resident Killer Whales; 69 FR 75608, Dec. 17, 2004, at 75633)

These same past designations have also recognized that whether national security impacts result from the designation depends on whether future consultations would be required under the jeopardy standard regardless of the critical habitat designation, and whether the critical habitat designation would add new burdens beyond those related to the jeopardy consultation.

As discussed above, based on the past 10-year consultation history, it is likely that consultations with respect to activities on DOD facilities will be triggered as a result of the critical habitat designation. Further, it is possible that some consultations will be due to the presence of the essential feature alone, and that adverse modification of the essential feature could result, thus requiring a reasonable and prudent alternative to the proposed DOD activity.

On May 22, 2007, we sent a letter to DOD requesting information on national security impacts of the proposed critical habitat designation, and received a response from the Department of the Navy (Navy). Further discussions and correspondence identified NASKW as the only installation potentially affected by the critical habitat designation. However, as discussed above, critical habitat is no longer being designated within the boundaries of NASKW pursuant to 4(a)(3)(B) because this facility is covered by an appropriate INRMP. During the public comment period, the Navy added the RAA off Dania, Florida, as an installation likely to be impacted by this designation. The Dania RAA overlays with the Florida specific area of critical habitat (Area 1). No other DOD installations were identified as likely to be impacted by this designation.

The Navy determined activities within the Dania RAA would be adversely impacted by requirements to modify the actions to avoid destroying or adversely modifying critical habitat. The Dania RAA contains underwater cables that enable real-time data acquisition from Navy sensor systems used in Navy exercises. The Navy concluded that the critical habitat designation at the Dania RAA would likely impact national security by diminishing military readiness through the requirement to consult on their activities within critical habitat in

addition to the requirement to consult on the two listed corals. We discuss our exclusion analysis based on these national security impacts below.

Other Relevant Impacts

Past critical habitat designations have identified two broad categories of other relevant impacts: conservation benefits, both to the species and to society as a result of designation, and impacts on governmental or private entities that are implementing existing management plans that provide benefits to the listed species. Our Final Section 4(b)(2) Report discusses conservation benefits of designating the four specific areas to the corals, and the benefits of conserving the corals to society, in both ecological and economic metrics.

As summarized in the Final 4(b)(2) Report, elkhorn and staghorn corals currently provide a range of important uses and services to society. Because the features that form the basis of the critical habitat are essential to, and thus contribute to, successful conservation of the two listed corals, protection of critical habitat from destruction or adverse modification may, at minimum, prevent further loss of the benefits currently provided by the species. Moreover, because the essential feature is essential to increasing the abundance of elkhorn and staghorn corals, its successful protection may actually 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 this designation. However, although the essential feature is key to the corals' conservation, critical habitat designation alone will not bring about their recovery. The benefits of conserving elkhorn and staghorn coral are, and will continue to be, the result of several laws and regulations.

Elkhorn and staghorn corals are two of the major reef-building corals in the Caribbean. Over the last 5,000 years, they have made a major contribution to the structure that makes up the Caribbean reef system. The structural and ecological roles of Atlantic acroporids in the Caribbean are unique and cannot be filled by other reef-building corals in terms of accretion rates and the formation of structurally complex reefs. At current levels of acroporid abundance, this ecosystem function is significantly reduced. Due to elkhorn and staghorn corals' extremely reduced abundance, it is likely that Caribbean reefs are in an erosional, rather than accretional, state.

In addition to the important functions of reef building and reef maintenance

provided by elkhorn and staghorn corals, these species themselves serve as fish habitat (Ogden and Ehrlich, 1977; Appeldoorn *et al.*, 1996), including essential fish habitat (CFMC, 1998), for species of economic and ecological importance. Specifically, Lirman (1999) reported significantly higher abundances of grunts (Haemulidae), snappers (Lutjanidae), and sweepers (Pempferidae) in areas dominated by elkhorn coral compared to other coral sites, suggesting that fish schools use elkhorn colonies preferentially. Additionally, Hill (2001) found that staghorn coral in a Puerto Rican back-reef lagoon was the preferred settlement habitat for the white grunt (*Haemulon plumieri*). Numerous reef studies have also described the relationship between increased habitat complexity and increased species richness, abundance, and diversity of fishes. Due to their branching morphologies, elkhorn and staghorn corals provide complexity to the coral reef habitat that other common species with mounding or plate morphologies do not provide.

Another benefit of elkhorn and staghorn corals is provided in the form of shoreline protection. Again, due to their function as major reef building species, elkhorn and staghorn corals provide shoreline protection by dissipating the force of waves, which are a major source of erosion and loss of land (NOAA, 2005). For example, in 2005, the coast of Mexico north of Cancun was impacted by Hurricane Wilma; wave height recorded just offshore of the barrier reef was 11 m while wave height at the coast was observed to be 3 m (B. van Tussenbroek, pers. comm.). Damage to coastal structures would have been significantly greater had the 11-m waves not been dissipated by the reef.

Lastly, numerous studies have identified the economic value of coral reefs to tourism and recreation. Of particular relevance, Johns *et al.* (2003) estimated the value of natural reefs to reef users, and the contribution of natural reefs to the economies of the four counties of Florida that are associated with the designation (discussed below). The importance of the benefits elkhorn and staghorn corals provide is also evidenced by the designation of marine protected areas specifically for the protection of these species (e.g., Tres Palmas Reserve, Puerto Rico).

Many previous designations have evaluated the impacts of designation on relationships with, or the efforts of, private and public entities that are involved in management or conservation efforts benefitting listed

species. Similar to national security impacts, impacts on entities responsible for natural resource management or conservation plans that benefit listed species, or on the functioning of those plans, depend on the type and number of ESA section 7 consultations and potential project modifications that may result from the critical habitat designation in the areas covered by the plans. Several existing resource management areas (Florida Keys National Marine Sanctuary, Dry Tortugas National Park, Dry Tortugas Ecological Reserve, Biscayne Bay National Park, Buck Island Reef National Monument, Virgin Islands National Park, and Virgin Islands Coral Reef National Monument) will likely require section 7 consultation under the ESA in the future when the responsible Federal agencies revise their management plans or associated regulations or implement management actions. Negative impacts to these agencies could result if the designation interferes with their ability to provide for the conservation of the species or otherwise hampers management of these areas. Because we identified that resource management was a category of activities that may affect both the species and the critical habitat and that the project modifications required through section 7 consultation would be the same for the species and the essential feature, these costs are considered to be coextensive. However, we found no evidence that relationships would be negatively affected or that negative impacts to other agencies' ability to provide for the conservation of the corals would result from the designation. We also describe in our final 4(b)(2) report that the critical habitat designation will provide an important unique benefit to the corals by protecting settling substrate for future coral recruitment and recovery, compared to existing laws and management plans for these areas that focus on protecting existing coral resources.

Synthesis of Impacts within the Four Specific Areas

As discussed above, no categories of Federal actions would require consultation in the future solely due to the critical habitat designation; all projected categories of future actions have the potential to adversely affect both the essential feature and the listed corals. However, an individual action within these categories may ultimately result in impacts to only the essential feature because the species may not be present within the action area. In addition, past actions triggered

consultation due to effects on one or more other listed species within the areas covered by the designation (e.g., sea turtles, smalltooth sawfish, Johnson's seagrass), but for purposes of the impacts analysis we assumed these other species consultations would not be co-extensive with consultations for the corals or the essential feature. For each of the specific areas, whether future consultations are incremental impacts of the critical habitat designation or are co-extensive impacts of the listing or other legal authorities will depend on whether the listed corals or other coral species are in the action area. Based on the relative abundance of the essential feature and the listed corals, or all corals combined, there seems to be a higher likelihood that a future project could impact the essential feature alone and thus be an incremental impact of designation. On the other hand, projects with larger or diffuse action areas may have a greater likelihood of impacting both the essential feature and the corals, and the same modifications would alleviate both types of impacts, so the costs of these projects would more likely be co-extensive either with the listing or existing authorities focused on protecting coral reef resources.

In the proposed rule, we related the proportion of consultations within each critical habitat area to the length of shoreline within that area. Upon review of the data used to calculate the length of shoreline, we discovered that the resolution of the individual shorelines between each critical habitat area are not comparable. Thus, we cannot use the shoreline data to evaluate whether or not an area will have disproportionate economic impacts.

The Florida specific area of critical habitat (Area 1) will have the greatest number of ESA section 7 consultations resulting from the critical habitat designation over the next 10 years, 317 consultations, or, on average, 31 per year; the Puerto Rico specific area (Area 2) will have the second highest number of consultations, 115, or, on average, 11–12 per year; and the U.S.V.I. specific areas combined (Areas 3 and 4) will have the lowest number of consultations, 41, or, on average, 4 per year. This ranking of number of consultations by area (Florida>Puerto Rico>U.S.V.I) is also reflected in the "by area" ranking of population, total annual payroll, and annual payroll within the construction sector (which will likely be the most impacted sector of the economy). In all four specific areas COE-permitted marine construction activities comprise the largest number of projected future

actions, in similar percentages across the areas (75 percent in Area 1; 65 percent in Area 2; and 61 percent in Areas 3 and 4). Further, because we do not know the exact location of future projects, we cannot identify patterns or clumping in the geographic distribution of future consultations and project modifications within any of the specific areas. Thus, we cannot identify any particular areas within the specific areas identified that are expected to incur a disproportionate share of the costs of designation. However, there is no evidence that any portion of any area is geographically predisposed to a greater number of section 7 consultations.

As mentioned above, the majority of projected ESA section 7 consultations in all four specific areas will be COE-authorized marine construction activities, and all of these could involve third-party permittees. Although we assumed all of these projects will require formal consultation due to effects on the essential feature and the corals to avoid underestimating ESA section 7 impacts, as discussed in our impacts report, it is unlikely that all of these projects will trigger consultation for either the essential feature or the corals, or that they would require modification to avoid adverse impacts. Though our database on past consultations is not complete, the data indicate that the majority of the projects in this category were residential dock construction, and, as such, would have been located in protected shorelines such as manmade canals where the essential feature and the corals are not routinely found. Even when these projects trigger consultation in the future, the project modifications that may be required as a result of the critical habitat designation may also be required by an existing regulatory authority, including the ESA listing of the two corals. Thus, if both the essential feature and corals are present, or if another regulatory authority would also require the project modification, the costs associated with these project modifications will be co-extensive. Many of the other categories of activities projected to occur in all four specific areas have the potential to have effects over larger, more diffuse action areas, and thus are more likely to be coextensive costs of the designation (e.g., dredging projects, water discharge, and water quality regulatory projects).

We estimated the maximum incremental administrative costs of conducting ESA section 7 consultation for each of the four specific areas. Multiplying the total number of consultations by the low and high estimates of cost yields the following

ranges of total administrative costs (in 2007 dollars) per area over the next 10 years: \$5,651,195 to \$11,157,488 in Area 1; \$2,050,118 to \$4,047,669 in Area 2; and \$730,911 to \$1,443,082 in Areas 3 and 4. Table 1 above provides a summary of the estimated costs, where possible, of individual project modifications. The Final Section 4(b)(2) Report provides a detailed description of each project modification, methods of determining estimated costs, and the action(s) for which it may be prescribed. Although we have a projection of the number of future formal consultations (albeit an overestimation), the lack of information on the specifics of project design limits our ability to forecast the exact type and amount of modifications required. Therefore, while the costs associated with types of project modifications were characterized, no total cost of this rule can be quantified accurately.

Preventing destruction or adverse modification of critical habitat is expected to contribute to the preservation of, and potential increases in, economic and other conservation benefits in each of the four specific areas, as described in the Final Section 4(b)(2) Report. In Area 1, the natural reefs formed and inhabited by elkhorn and staghorn corals provide over \$225 million in average annual use value (2003 dollars) and a capitalized value of over \$7 billion to the four Florida counties covered by Area 1. Natural reef-related industries provided over 40,000 jobs in Area 1 in 2003, generating over \$1 billion in income. Area 1 experienced almost \$6 million in value of commercial reef-dependent fish landings in 2005. Available information also demonstrates the direct link between healthy coral reef ecosystems and the value of scuba-diving related tourism throughout the Caribbean, including Florida, with estimated losses in the hundreds of millions of dollars region-wide per year if reef degradation continues. Coral reefs provided over 87 percent of average annual commercial fish and invertebrate landings in Puerto Rico (Area 2) from 1995 to 2002. In 2005, domestic landings of shallow water reef fish comprised about 66 percent of all fish landed in Puerto Rico and were valued at over \$1.7 million. Tourism is not as dominant a component of Puerto Rico's overall economy as it is in Areas 1, 3, and 4, but it may be much more significant for the shoreside communities from which dive and other reef-related tourism activities embark. Tourism accounts for 80 percent of the U.S.V.I.'s (Area 3) Gross Domestic Product and

employment. One survey documented that 100 percent of hotel industry respondents stated they believed there would be a significant impact on tourist visits if the coast and beaches were degraded, or fisheries or coral reefs declined. In 2005, domestic landings of shallow water reef fish comprised about 83 percent of all fish landed in the U.S.V.I. that year and were valued at over \$3.8 million.

Conservation benefits to the corals in each of the four specific areas are expected to result from the designation. As we have determined, recovery of elkhorn and staghorn corals cannot succeed without protection of the essential feature from destruction or adverse modification. No existing laws or regulations protect the essential feature from destruction or adverse modification with a specific focus on increasing coral abundance and eventual recovery. Given the extremely low current abundance of the corals and characteristics of their sexual reproduction (e.g., limited success over long ranges), protecting the essential feature throughout the corals' range and throughout each of the four specific areas is extremely important for conservation of these species. We also describe the potential educational and awareness benefits to the corals that may result from the critical habitat designation in our Final 4(b)(2) Report.

Regarding economic impacts, the limitations to the type and amount of existing information do not allow us to predict the total costs and benefits of the critical habitat designation. Nevertheless, we believe that our characterization of the types of costs and benefits that may result from the designation, in particular circumstances, may provide some useful information to Federal action agencies and potential project permittees. We have based the designation on a very specifically defined feature essential to the corals' conservation, which allowed us to identify the few, specific effects of human activities that may adversely affect the corals and thus require section 7 consultation under the ESA (sedimentation, nutrification, and physical destruction). We identified potential routine project modifications we may require to avoid destroying or adversely modifying the essential substrate feature. In some cases, these modifications are common environmental mitigation measures that are already being performed under existing laws and regulations that seek to prevent or minimize adverse impacts to coral reef or marine resources in general. Thus, we believe that parties planning future activities within the

four specific areas designated as critical habitat for listed corals will be able to predict the potential added costs of their projects resulting from the designation based on their knowledge of the location, size, and timing of their planned activities. We have discussed to the extent possible the circumstances under which section 7 impacts will be incremental impacts of this rule, or co-extensive impacts of this rule and the listing of the corals or another existing legal authority. We believe that the limitations of current information about potential future projects do not allow us to be more specific in our estimates of the section 7 impacts (administrative consultation and project modification costs) of the designation. In addition, based on available information, we could not identify any patterns or clumping in the distribution of future projects (and the associated consultations and potential modifications) either between or within the four specific areas designated as critical habitat for listed corals that would suggest any disproportionate impact of the designation.

Similarly, with regard to the conservation benefits of the designation, we determined that the designation will result in benefits to society. We provide a literature survey of the valuation of coral reefs to provide context for the readers on benefits of protective measures. Given the potential number and types of future ESA section 7 consultations, we expect that the designation will prevent adverse effects to the critical habitat feature, and thus assist in maintaining the feature's conservation function for the two corals. We believe the designation will assist in preventing further losses of the corals and, eventually, in increased abundance of the two species. By contributing to the continued existence of these two species and eventually their increased abundance, the designation, at minimum, prevents loss of important societal benefits described above that are currently provided by the species, and potentially increases these benefits over time.

Regarding impacts on Federal agencies responsible for managing resources in areas designated as critical habitat for listed corals, we expect ESA section 7 consultation responsibilities will result from the designation as described above. However, as explained further in the section 4(b)(2) report, we determined that the designation will not negatively impact the management or operation of existing managed areas or the Federal agencies responsible for these areas. We further determined that the designation provides an added

conservation benefit to the corals beyond the benefits provided by the existing management plans and associated regulations. We believe our evaluation and consideration of the potential impacts above support our conclusion that there are no economic or other relevant impacts that warrant our excluding particular areas from the designation.

As discussed in the next section, we are exercising our discretion to exclude particular areas from the critical habitat designation based on national security impacts.

Exclusions Under Section 4(b)(2)

Impacts to national security as a result of the critical habitat designation are expected to occur in Area 1, specifically on a 5.5 sq mile (14.2 sq km) area of the RAA, Dania, FL. Based on information provided to us by the Navy, national security interests would be negatively impacted by the designation, because the potential additional consultations and project modifications to avoid adversely modifying the essential feature would interfere with military training and readiness. Based on these considerations, we are excluding the particular area identified by the Navy from the critical habitat designation.

The benefit of excluding the Dania RAA particular area is that the Navy would only be required to comply with the jeopardy prohibition of ESA section 7(a)(2) and not the adverse modification prohibition in this area. The Navy maintains that the additional commitment of resources in completing an adverse modification analysis, and any change in its activities to avoid adverse modification of critical habitat, would likely reduce its readiness capability. Given that the Navy is currently actively engaged in training, maintaining, and deploying forces in the current war effort, this reduction in readiness could reduce the ability of the military to ensure national security.

The excluded area comprises only 0.42 percent of Area 1. Navy regulations prohibit anchoring, trawling, dredging, or attaching any object within the area; thus, the corals and their habitat will be protected from these threats. Further, the corals and their habitat will still be protected through ESA section 7 consultations that prohibit jeopardizing the species' continued existence and require modifications to minimize the impacts of incidental take. Further, we do not foresee other Federal activities that might adversely impact critical habitat that would be exempted from future consultation requirements due to this exclusion, since these areas are under exclusive military control.

Therefore, in our judgment, the benefit of including the particular area of the Dania RAA is outweighed by the benefit of avoiding the impacts to national security the Navy would experience if they were required to consult based on critical habitat. Given the small percentage of Area 1 encompassed by this area, we conclude that exclusion will not result in extinction of either elkhorn or staghorn coral.

Critical Habitat Designation

We are designating approximately 2,959 square miles (7,664 sq km) of marine habitat within the geographical area occupied by elkhorn and staghorn corals in Florida, Puerto Rico, and the U.S.V.I. The specific areas contain the substrate physical feature we determined to be essential to the conservation of these species and that may require special management considerations or protection.

Peer Review

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing minimum peer review standards, a transparent process for public disclosure of peer review planning, and opportunities for public participation. The OMB Bulletin, implemented under the Information Quality Act (Public Law 106-554), is intended to enhance the quality and credibility of the Federal Government's scientific information, and applies to influential or highly influential scientific information disseminated on or after June 16, 2005. To satisfy our requirements under the OMB Bulletin, we obtained independent peer review of the scientific information that supported our proposed rule to designate critical habitat for elkhorn and staghorn corals and incorporated the peer review comments prior to dissemination of the proposed rulemaking. The draft 4(b)(2) Report (NMFS, 2007) that supports the proposal to designate critical habitat for elkhorn and staghorn corals was also peer reviewed and the Final 4(b)(2) Report is available on our web site (see ADDRESSES).

Classification

We determined that this action is consistent to the maximum extent practicable with the enforceable policies of the approved coastal management programs of Florida, Puerto Rico, and U.S.V.I. The determination was submitted for review by the responsible state agencies under section 307 of the Coastal Zone Management Act. We did not receive responses from Puerto Rico or the U.S.V.I.; Florida found the

regulation consistent with its approved coastal management programs.

This rule has been determined to be significant under Executive Order (E.O.) 12866. We have integrated the regulatory principles of the E.O. into the development of this final rule to the extent consistent with the mandatory duty to designate critical habitat, as defined in the ESA.

We prepared a FRFA pursuant to section 604 of the Regulatory Flexibility Act (5 U.S.C. 602 *et seq.*), which describes the economic impact this rule would have on small entities. A description of the action, why it is being considered, and its legal basis are included in the preamble section of this final rule.

Small businesses, small nonprofit organizations, and small governmental jurisdictions may be affected by this designation if they engage in activities that would affect the essential feature identified in this designation and if they receive funding or authorization for such activity from a Federal agency. Such activities would trigger ESA section 7 consultation requirements and potential requirements to modify proposed activities to avoid destroying or adversely modifying the critical habitat. The consultation record from which we have projected likely Federal actions over the next 10 years indicates that applicants for Federal permits or funds have included small entities. For example, marine contractors have been the recipients of COE permits for dock construction; some of these contractors were small entities.

According to the Small Business Administration, businesses in the Heavy and Civil Engineering Construction subsector (NAICS Code 237990), which includes firms involved in marine construction projects such as breakwater, dock, pier, jetty, seawall, and harbor construction, must have average annual receipts of no more than \$31 million to qualify as a small business (dredging contractors that perform at least 40 percent of the volume dredged with their own equipment, or equipment owned by another small concern are considered small businesses if their average annual receipts are less than or equal to \$18.5 million). Our consultation database does not track the identity of past permit recipients or whether the recipients were small entities, so we have no basis to determine the percentage of grantees or permittees that may be small businesses in the future. We do know from the more recent consultation history that small governmental jurisdictions (population less than or equal to 50,000) have received COE

permits for beach renourishment. Small businesses in the tourist and commercial fishing industries may benefit from the rule, as conservation of elkhorn and staghorn corals is expected to result in increased direct and indirect use of, and values derived from, coral reefs.

We projected that, on average, approximately 39 Federal projects with non-Federal grantees or permittees will be affected by implementation of the critical habitat designation, annually, across all four areas included in the critical habitat designation. Some of these grantees or permittees could be small entities, or could hire small entities to assist in project implementation. Historically, these projects have involved pipeline installation and maintenance, mooring construction and maintenance, dock/pier construction and repair, marina construction, bridge repair and construction, new dredging, maintenance dredging, NPDES/water quality standards, cable installation, beach renourishment, shoreline stabilization, reef ball construction and installation, and port construction. Potential project modifications we have identified that may be required to prevent these types of projects from adversely modifying critical habitat include: project relocation; environmental conditions monitoring; GPS and DPV protocols; diver assisted anchoring or mooring buoy use; pipe collars or cable anchoring; shoreline protection measures; use of upland or artificial sources of sand; directional drilling or tunneling; and sediment and turbidity control measures (see Tables 20, 21 and 24 of the Final Section 4(b)(2) Report).

Even though we cannot determine relative numbers of small and large entities that may be affected by this final rule, there is no indication that affected project applicants would be limited to, nor disproportionately comprise, small entities. It is unclear whether small entities would be placed at a competitive disadvantage compared to large entities. However, as described in the Final Section 4(b)(2) Report, consultations and project modifications will be required based on the type of permitted action and its associated impacts on the essential critical habitat feature. Because the costs of many potential project modifications that may be required to avoid adverse modification of critical habitat are unit costs (e.g., per mile of shoreline, per cubic yard of sand moved) such that total project modification costs would be proportional to the size of the project, it is not unreasonable to assume that

larger entities would be involved in implementing the larger projects with proportionally larger project modification costs.

It is also unclear whether the rule will significantly reduce profits or revenue for small businesses. As discussed throughout the Final Section 4(b)(2) Report, we made assumptions that all of the future consultations will be formal, and all will require project modifications; but this is likely an overestimation. In addition, as stated above, though it is not possible to determine the exact cost of any given project modification resulting from consultation, the smaller projects most likely to be undertaken by small entities would likely result in relatively small modification costs. Finally, many of the modifications identified to reduce the impact of a project on critical habitat may be a baseline requirement either due to the ESA listing of the species or under another regulatory authority, notably the CWA.

There are no record-keeping requirements associated with the rule. Similarly, there are no reporting requirements other than those that might be associated with reporting on the progress and success of implementing project modifications, which do not require specific skills to satisfy. However, third party applicants or permittees would be expected to incur costs associated with participating in the administrative process of consultation along with the permitting Federal agency. Such third party costs of consultation were estimated for the 2003 designation of critical habitat for Gulf sturgeon in the southeast United States. In 2007 dollars, per consultation administrative costs for third parties are estimated to average from \$3,314 to \$4,685.

No Federal laws or regulations duplicate or conflict with this final rule. Existing Federal laws and regulations overlap with the rule only to the extent that they provide protection to marine natural resources or corals generally. However, no existing laws or regulations specifically prohibit destruction or adverse modification of critical habitat for, and focus on the recovery of, elkhorn and staghorn corals.

The alternatives to the designation considered consisted of a no-action alternative and an alternative based on a broader conservation objective that would include multiple physical or biological features of the corals' environment in the designation. The no-action, or no designation, alternative would result in no additional ESA section 7 consultations relative to the

status quo of the species' listing and finalization of the ESA section 4(d) rule for these species. However, while additional administrative and potential project modification costs would not be incurred under this alternative, this alternative is not necessarily a no-cost alternative, including to small entities, given the potential loss of existing benefits provided by the corals if they continue to decline due to failure to protect the substrate essential feature from adverse modification. The multiple features alternative was expected to increase the number and complexity of section 7 consultations and associated costs to small entities without concomitant increased conservation benefits to the corals, because we believe the additional features are already effectively managed through the jeopardy analysis required under ESA section 7 or subsumed within the substrate essential feature identified for this designation.

An environmental analysis as provided for under National Environmental Policy Act for critical habitat designations made pursuant to the ESA is not required. See *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied, 116 S.Ct. 698 (1996).

Pursuant to the Executive Order on Federalism, E.O. 13132, the Assistant Secretary for Legislative and Intergovernmental Affairs provided notice of the action and requested comments from the appropriate official(s) of the states and territories in which the two species occur. As mentioned above, Florida found the regulation consistent with its approved coastal management programs, and Puerto Rico and the U.S.V.I. did not respond.

The action has undergone a pre-dissemination review and been determined to be in compliance with applicable information quality guidelines implementing the Information Quality Act (Section 515 of Public Law 106-554).

This action does not contain a collection-of-information requirement for purposes of the Paperwork Reduction Act.

This rule is consistent with E.O. 13089, which is intended to preserve and protect the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment.

References Cited

A complete list of all references cited in this rulemaking can be found on our website at <http://sero.nmfs.noaa.gov/pr/protres.htm> and is available upon request from the NMFS Southeast

Regional Office in St. Petersburg, Florida (see ADDRESSES).

List of Subjects

50 CFR Part 223

Endangered and threatened species, Exports, Imports, Transportation.

50 CFR Part 226

Endangered and threatened species.

Dated: November 14, 2008.

James W. Balsiger,

Acting Assistant Administrator of Fisheries, National Marine Fisheries Service.

■ For the reasons set out in the preamble, we amend 50 CFR parts 223 and 226 as set forth below:

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 issued under 16 U.S.C. 1361 *et seq.*; 16 U.S.C. 5503(d) for § 223.206(d)(9).

§ 223.102 [Amended]

■ 2. Amend § 223.102 by removing the text, “NA”, from the column labeled “Citation for Critical Habitat Designation” in paragraphs (d)(1) and (d)(2) and adding in its place 73 FR [Insert FR page number where the document begins]; November 26, 2008.

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 § 226.216, to read as follows:

§ 226.216 Critical habitat for elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*) corals.

Critical habitat is designated for both elkhorn and staghorn corals as described in this section. The textual descriptions of critical habitat in paragraphs (b) and (c) of this section are the definitive source for determining the critical habitat boundaries. The overview maps in paragraph (d) of this section are provided for general guidance purposes only, and not as a definitive source for determining critical habitat boundaries.

(a) *Physical Feature Essential to the Conservation of Threatened Corals.* The physical feature essential to the conservation of elkhorn and staghorn corals is: substrate of suitable quality and availability to support larval settlement and recruitment, and reattachment and recruitment of asexual

fragments. “Substrate of suitable quality and availability” is defined as natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover.

(b) *Critical Habitat Areas.* Critical habitat includes one specific area of the Atlantic Ocean offshore of Palm Beach, Broward, Miami-Dade, and Monroe counties, Florida, and three specific areas of the Atlantic Ocean and Caribbean Sea offshore of the U.S. Territories of Puerto Rico and the U.S. Virgin Islands. The boundaries of each specific critical habitat area are described below. Except as specified below, the seaward boundary is the 98–ft (30–m) depth contour and the shoreward boundary is the line of mean low water (MLW; 33 CFR 2.20). Within these boundaries, discrete areas of water deeper than 98 ft (30 m) are not included.

(1) *Florida Area:* The Florida area contains three sub-areas.

(i) The shoreward boundary for Florida sub-area A begins at the 6–ft (1.8 m) contour at the south side of Boynton Inlet, Palm Beach County at 26° 32′ 42.5″ N; then runs due east to the point of intersection with the 98–ft (30 m) contour; then follows the 98–ft (30 m) contour to the point of intersection with latitude 25° 45′ 55″ N, Government Cut, Miami-Dade County; then runs due west to the point of intersection with the 6–ft (1.8 m) contour, then follows the 6–ft (1.8 m) contour to the beginning point.

(ii) The shoreward boundary of Florida sub-area B begins at the MLW line at 25° 45′ 55″ N, Government Cut, Miami-Dade County; then runs due east to the point of intersection with the 98–ft (30 m) contour; then follows the 98–ft (30 m) contour to the point of intersection with longitude 82° W; then runs due north to the point of intersection with the South Atlantic Fishery Management Council (SAFMC) boundary at 24° 31′ 35.75″ N; then follows the SAFMC boundary to a point of intersection with the MLW line at Key West, Monroe County; then follows the MLW line, the SAFMC boundary (see 50 CFR 600.105(c)), and the COLREGS line (see 33 CFR 80.727. 730, 735, and 740) to the beginning point.

(iii) The seaward boundary of Florida sub-area C (the Dry Tortugas) begins at the northern intersection of the 98–ft (30 m) contour and longitude 82° 45′ W; then follows the 98–ft (30 m) contour west around the Dry Tortugas, to the southern point of intersection with

longitude 82° 45′ W; then runs due north to the beginning point.

(2) *Puerto Rico Area:* All areas surrounding the islands of the Commonwealth of Puerto Rico, 98 ft (30 m) in depth and shallower, seaward of the COLREGS line (see 33 CFR 80.738).

(3) *St. Thomas/St. John Area:* All areas surrounding the islands of St. Thomas and St. John, U.S. Virgin Islands, and smaller surrounding islands, 98 ft (30 m) in depth and shallower.

(4) *St. Croix Area:* All areas surrounding the island of St. Croix, U.S. Virgin Islands, 98 ft (30 m) in depth and shallower.

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

(1) Pursuant to ESA section 4(a)(3)(B), all areas subject to the 2008 Naval Air Station Key West Integrated Natural Resources Management Plan.

(2) Pursuant to ESA section 3(5)(A)(i), all areas containing existing (already constructed) federally authorized or permitted man-made structures such as aids-to-navigation (ATONs), artificial reefs, boat ramps, docks, pilings, maintained channels, or marinas.

(3) Pursuant to ESA section 3(5)(A)(i), all waters identified as existing (already constructed) federally authorized channels and harbors as follows:

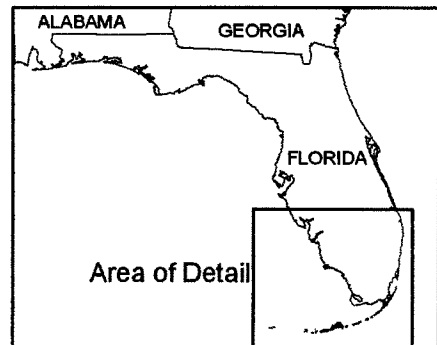
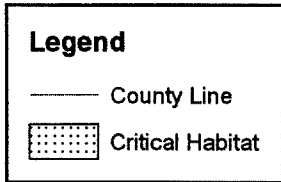
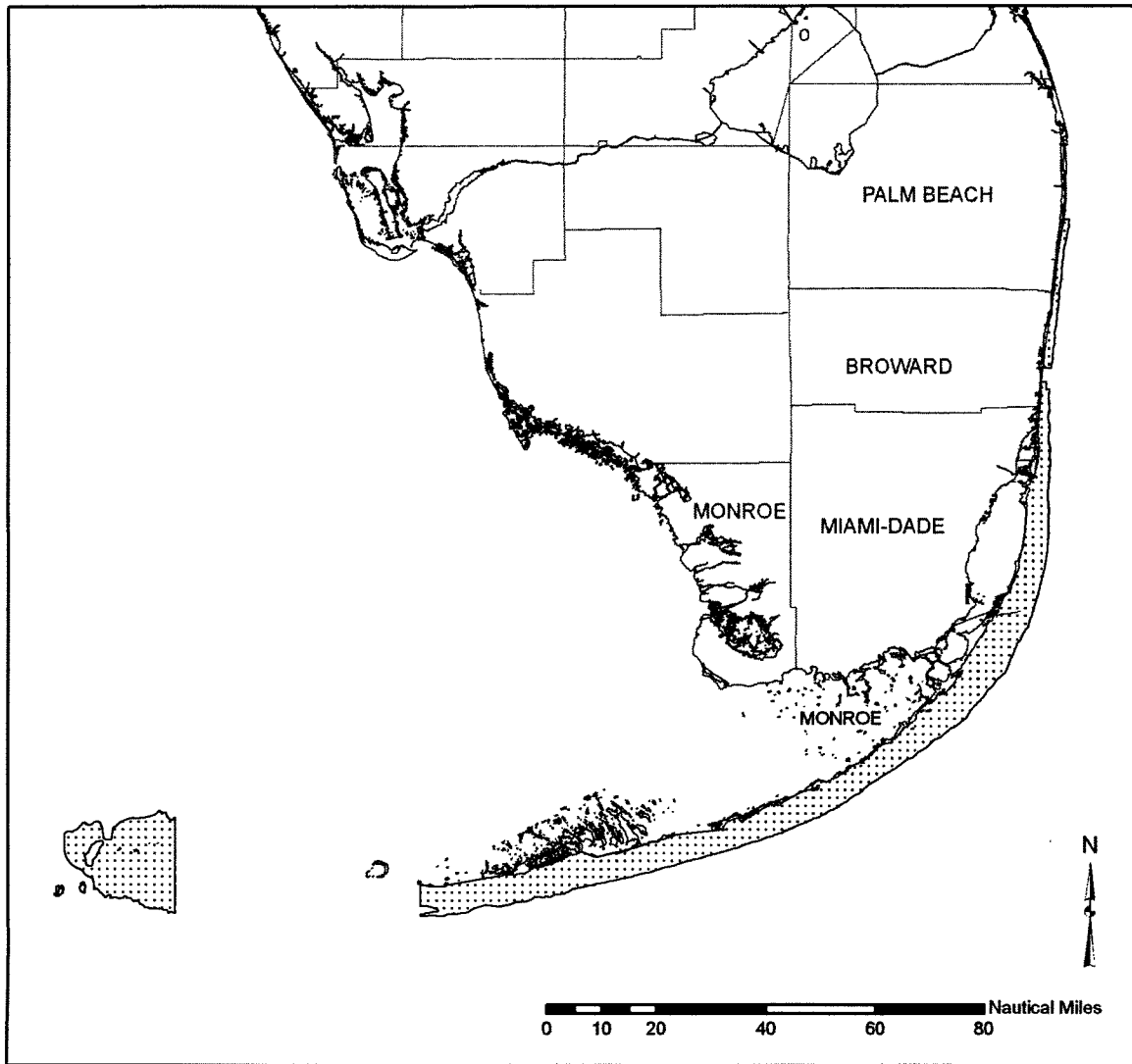
- (i) Palm Beach Harbor.
- (ii) Hillsboro Inlet.
- (iii) Port Everglades.
- (iv) Miami Harbor.
- (v) Key West Harbor.
- (vi) Arecibo Harbor.
- (vii) San Juan Harbor.
- (viii) Fajardo Harbor.
- (ix) Ponce Harbor.
- (x) Mayaguez Harbor.
- (xi) St. Thomas Harbor.
- (xii) Christiansted Harbor.

(d) Areas excluded from critical habitat. Pursuant to ESA Section 4(b)(2), all waters of the Restricted Anchorage Area as described at 33 CFR 334.580, beginning at a point located at 26° 05′ 30″ N, 80° 03′ 30″ W.; proceed west to 26° 05′ 30″ N, 80° 06′ 30″ W; thence, southerly to 26° 03′ 00″ N, longitude 80° 06′ 42″ W; thence, east to latitude 26° 03′ 00″ N, 80° 05′ 44″ W.; thence, south to 26° 01′ 36″ N, 80° 05′ 44″ W.; thence, east to 26° 01′ 36″ N, 80° 03′ 30″ W; thence, north to the point of beginning.

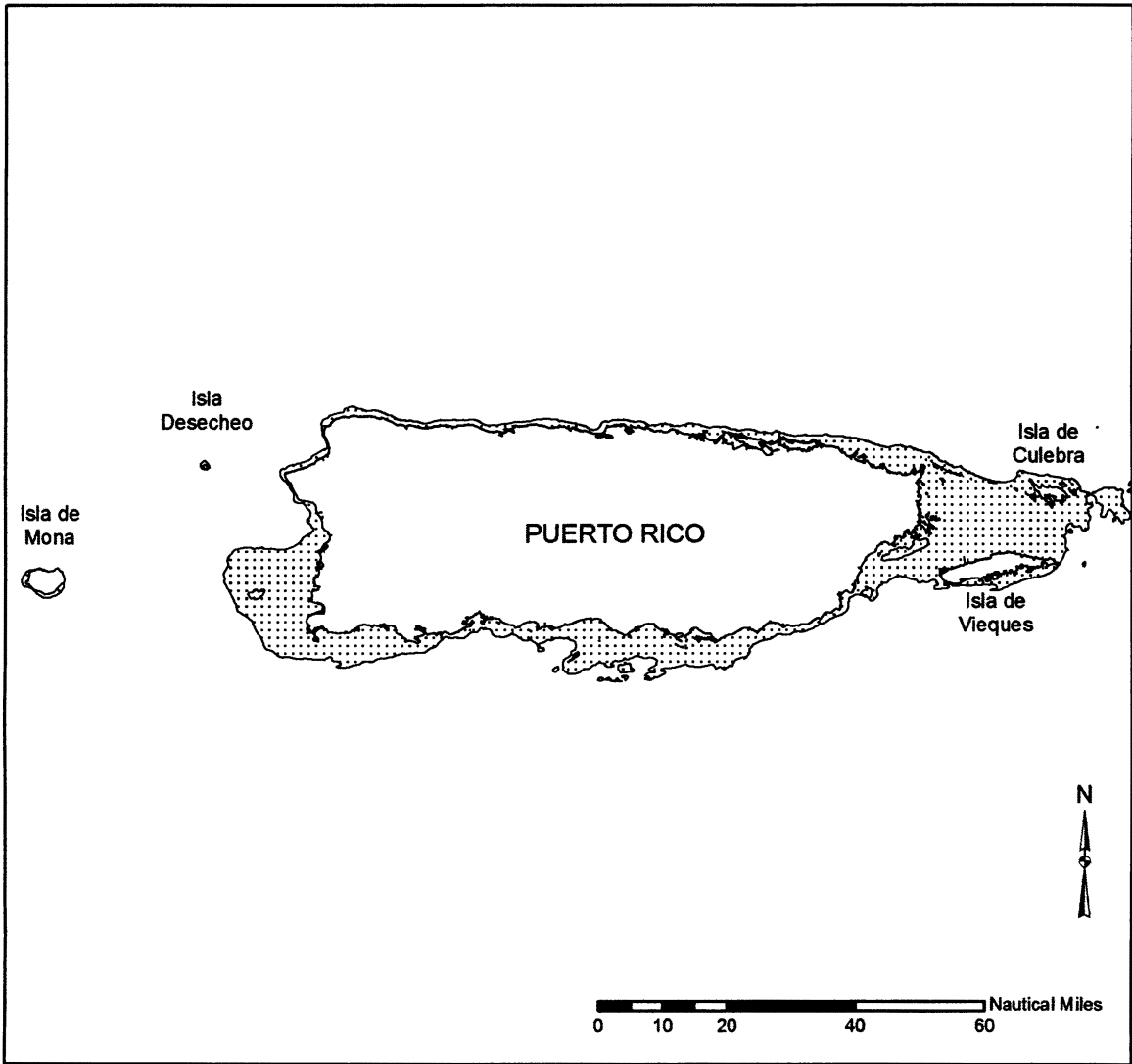
(e) Overview maps of designated critical habitat for elkhorn and staghorn corals follow.

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
**Critical Habitat for Elkhorn and Staghorn Corals
Area 1: Florida**



**Critical Habitat for Elkhorn and Staghorn Corals
Area 2: Puerto Rico and Associated Islands**



Legend

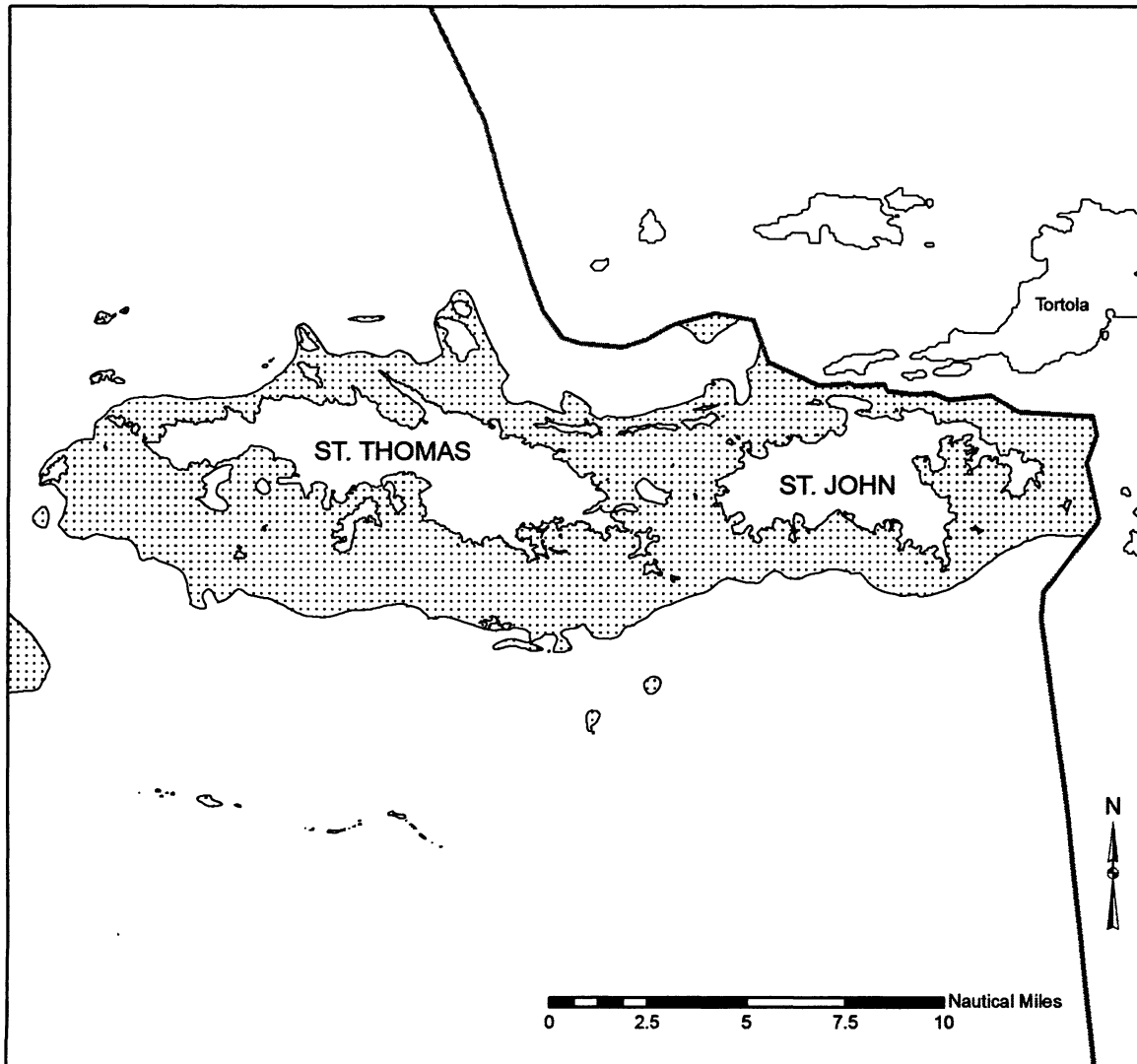
 Critical Habitat

Dominican Republic

PR

Area of Detail

**Critical Habitat for Elkhorn and Staghorn Corals
Area 3: St. John/St. Thomas, U.S.V.I.**



Legend

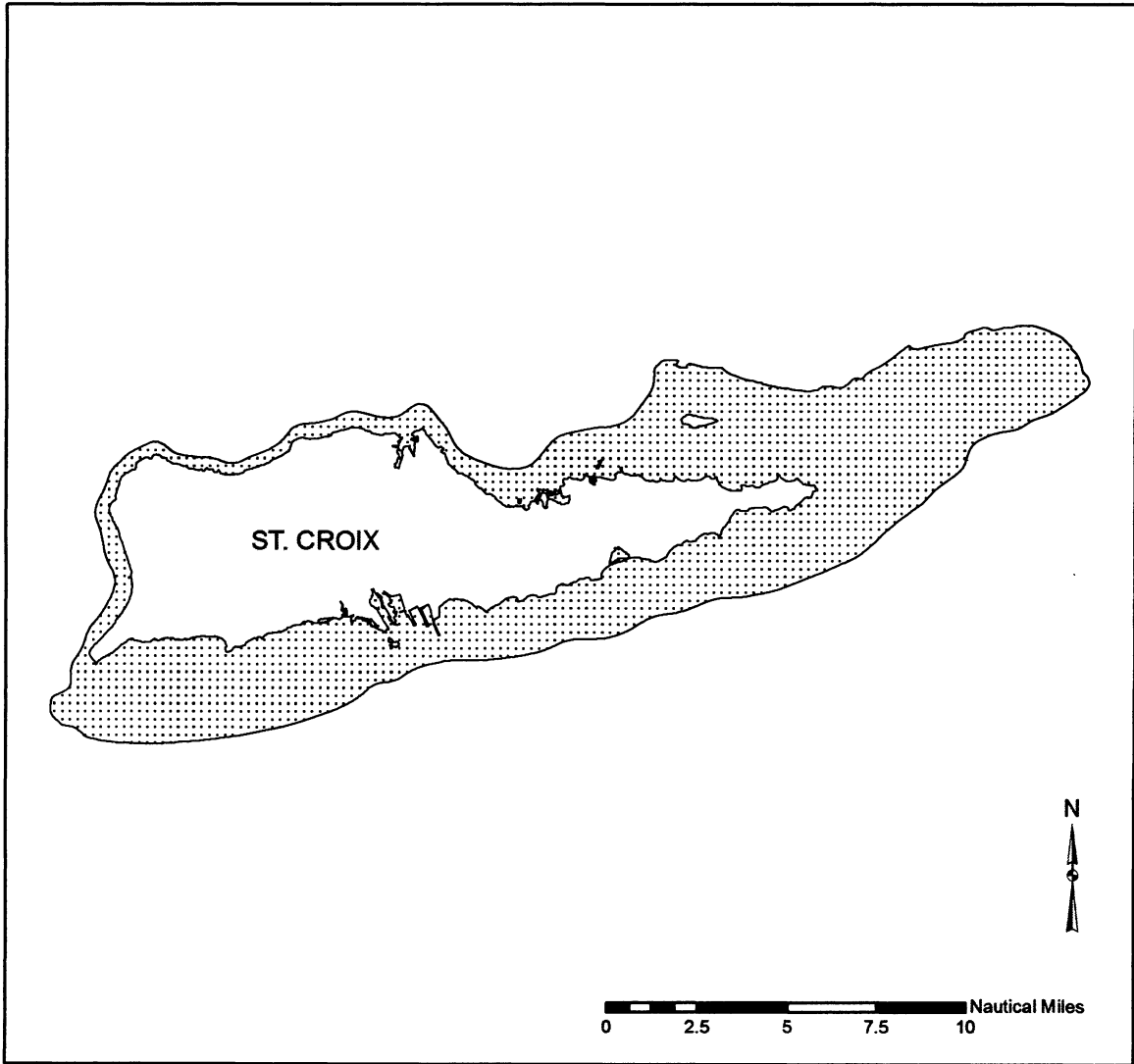
- Exclusive Economic Zone
- ▨ Critical Habitat

Puerto Rico


Area of Detail

The inset map shows the outline of Puerto Rico with a small rectangular box highlighting the location of the Area of Detail in the northern part of the island.

**Critical Habitat for Elkhorn and Staghorn Corals
Area 4: St. Croix, U.S.V.I.**



Legend

 Critical Habitat

