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# DRAFT

# Environmental Assessment

## Proposed Endangered Species Act 4(d) Regulations for Threatened Elkhorn and Staghorn Corals

Southeast Regional Office  
Protected Resources Division  
263 13<sup>th</sup> Avenue South  
St. Petersburg, Florida 33701  
Ph. (727) 824-5312



Photo Credit: W. Jaap

Staghorn Coral (*Acropora cervicornis*)



Photo Credit: M. Barnett

Elkhorn coral (*A. palmata*)

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## EXECUTIVE SUMMARY

The National Marine Fisheries Service (NMFS) proposes to promulgate a 4(d) rule that extends all of the prohibitions listed in section 9(a)(1) of the Endangered Species Act (ESA) to two threatened coral species. This proposed 4(d) rule would also provide exceptions for specific activities that contribute to the conservation of these species from the section 9(a)(1) prohibitions on import, export, and take. The affected areas are located in the Southeast United States and the Caribbean, including the state of Florida and the territories of Puerto Rico and the U.S. Virgin Islands. This action is necessary and advisable to provide for the conservation of threatened elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*) corals. Currently, these two threatened corals are not in danger of extinction throughout their ranges. However, they are likely to become so within the foreseeable future because of a combination of four of the five factors listed in section 4(a)(1) of the ESA, and this status is not being ameliorated by efforts to protect the species by state or foreign governments (70 FR 24359). NMFS expects the preferred alternative to result in a net reduction of the intensity of the stressors and threats contributing to the decline in abundance of these two coral species by implementing the ESA section 9 prohibitions for activities that negatively impact the species.

The preferred alternative would provide protection under the ESA deemed necessary and advisable to provide for the conservation of threatened corals. This alternative would have beneficial effects on elkhorn and staghorn corals and on other affected species, including other coral species and ecologically and economically important reef fishes, by providing greater regulation of activities affecting them. The ESA prohibitions extended by this alternative would add to existing prohibitions on activities affecting corals under federal, state, and territorial laws, and reduce the impacts of actions funded, authorized, or carried out by federal agencies on the two threatened coral species. The economic costs of the preferred alternative include costs associated with the implementation of reasonable and prudent measures (RPMs), which may be imposed by NMFS during the ESA section 7 consultation process, for Federal agency actions that will adversely affect listed corals. RPMs, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes. The economic benefits of implementing the ESA section 9 prohibitions for the two listed corals may include shoreline protection and increases in annual income generated directly and indirectly from person-days of snorkeling, SCUBA diving, fishing, and viewing elkhorn and staghorn coral reefs.

In addition to the preferred alternative, NMFS evaluated the following alternatives:

- ***No Action Alternative.*** Current programs would continue to guide management of the two threatened coral species. None of the prohibitions under section 9(a)(1) of the ESA would be extended to provide for the conservation of these coral species. This alternative represents the status quo. ESA Section 7 consultations on federal agency actions would only evaluate whether an action jeopardizes the continued existence of elkhorn or staghorn corals; because take would not be prohibited, no RPMs to minimize the impact of take resulting from Federal agency actions could be imposed. Reasonable and prudent alternatives (RPAs) to actions that adversely affect listed corals would only be required where actions are expected to jeopardize the continued existence of either coral species. This alternative would be expected to result in greater amounts of take of each listed coral species than the other alternatives, because the species numbers would likely continue to be reduced by actions resulting in take of the species. There is also the likelihood of smaller future annual incomes generated directly and indirectly from person-days of snorkeling, SCUBA diving, fishing, and viewing elkhorn and staghorn reefs, as species numbers continue to decline.
- ***A 4(d) Rule Extending All ESA Section 9 Prohibitions, With Take Exceptions For Specific Activities, Including Those Conducted Under Approved Resource Management Plans (RMPs).*** In

addition to the ESA section 9(a)(1) take exceptions provided by the preferred alternative, this alternative would allow incidental take exceptions for activities conducted in accordance with a NMFS-approved RMP. This alternative would have some beneficial effects on elkhorn and staghorn corals and on other affected species, including other coral species and ecologically and economically important reef fishes, by providing greater regulation of activities affecting them. The ESA prohibitions extended by this alternative would reduce the impacts of actions funded, authorized, or carried out by federal agencies on the two threatened coral species. Additionally, this alternative would result in a net reduction of the intensity of the stressors and threats contributing to the decline in these species' abundances by prohibiting most activities that constitute take under ESA sections 9(a)(1)(B) and 9(a)(1)(C). The economic costs of this alternative would include costs associated with the implementation of RPMs imposed pursuant to ESA section 7. Additional costs associated with this alternative may include less annual income generated directly and indirectly from the use of elkhorn and staghorn coral reefs because higher levels of incidental take are expected. The economic benefits of this alternative are similar to those of the preferred alternative; however, additional benefits include the costs saved by non-Federal entities acting under an approved RMP that would not be required to obtain an ESA section 10 incidental take permit (ITP) nor implement RPMs through ESA section 7 consultation.

- ***A 4(d) Rule Extending all ESA Section 9 Prohibitions, Without Exceptions.*** This alternative would extend all of the ESA section 9(a)(1) prohibitions to threatened elkhorn and staghorn corals, without exceptions. For all activities affecting the two listed coral species already subject to the consultation requirements of section 7 (federally funded, authorized, or conducted activities), RPMs could now be specified where necessary or appropriate to minimize the impact of incidental take on the two coral species. All non-federal activities, including restoration activities and scientific research, would be subject to the requirements of section 10 of the ESA. Economic costs associated with this alternative include the implementation costs of RPMs imposed pursuant to ESA section 7 plus the costs of obtaining an ESA section 10 permit. The economic benefits of this alternative are similar to those of the preferred alternative; however, delays in emergency response activities and delays in or foregone research activities may negatively impact the listed corals.

## **LIST OF PREPARERS**

### NOAA – NATIONAL MARINE FISHERIES SERVICE

Robert Hoffman – Endangered Species Branch Chief, Protected Resources Division, Southeast Regional Office

Denise Johnson – Economist, Southeast Regional Office

Jennifer Moore – Natural Resource Specialist, Protected Resources Division, Southeast Regional Office

Sarah Heberling – Natural Resource Specialist, Protected Resources Division, Southeast Regional Office

## ACRONYMS

USACE	U.S. Army Corps of Engineers
BRT	Atlantic <i>Acropora</i> Biological Review Team
CBD	Center for Biological Diversity
CEQ	Council on Environmental Quality
CITES	Convention on International Trade in Endangered Species
EA	Environmental Assessment
ESA	Endangered Species Act
IRFA	Initial Regulatory Flexibility Act Analysis
ITP	Incidental Take Permit
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
RIR	Regulatory Impact Review
RPA	Reasonable and Prudent Alternatives
RPM	Reasonable and Prudent Measures
RMP	Resource Management Plan

## LIST OF FIGURES

**Figure 1.** Approximate range of *Acropora* sp. (highlighted), including the Gulf of Mexico, Atlantic Ocean, and Caribbean Sea. The highlighted areas are not specific locations of the corals, but rather reflect general distributions (*Acropora* Biological Status Review 2005).

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**Table 1.** Summary of the three alternative actions to provide for the conservation of elkhorn and staghorn corals.

# INTRODUCTION

## Document Structure

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The National Marine Fisheries Service (NMFS) has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA, 42 USC 4321 *et seq.*), regulations issued by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508), and guidance issued by the National Oceanic and Atmospheric Administration (NOAA) in Administrative Order 216-6. This EA evaluates the direct, indirect, and cumulative environmental impacts that would result from the preferred alternative and other reasonable alternatives. The document is organized as follows:

- *Introduction:* This section summarizes information on the background of the listing of the two coral species, the purpose of and need for action, and the agency's preferred alternative for achieving that purpose and need.
- *Description of Proposed Action and Alternatives:* This section provides a more detailed description of the agency's preferred alternative as well as alternative methods for achieving the stated purpose.
- *Affected Environment:* This section describes the environment in which the preferred alternative and alternatives would be implemented. This description provides a view on current conditions and serves as a baseline against which to compare the environmental effects of implementing the alternatives. This analysis is organized into the following subsections: physical environment, biological environment, and socioeconomic environment.
- *Environmental Consequences:* This section describes and analyzes the anticipated environmental consequences (including the cumulative effects) of implementing the alternatives on the resources described in the *Affected Environment* section. This section focuses on determining whether significant impacts are likely to occur and provides a summary table of the environmental consequences associated with each alternative.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment, including in particular the Regulatory Impact Review and Initial Regulatory Flexibility Analysis.

Additional documentation, including the Proposed Endangered Species Act (ESA) 4(d) Regulations *Federal Register* notice and supporting administrative record, are located in the Protected Resources Division of the NMFS Southeast Regional Office, St. Petersburg, Florida.

## Background

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*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, Columbia, 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) (see Figure 1). Both elkhorn (*Acropora palmata*) and staghorn (*A. cervicornis*) corals used to be the most abundant and most important species on Caribbean coral reefs in terms of accretion of reef structure. Relative to other corals, both have high growth rates that have allowed reef growth to keep pace with past changes in sea level. Additionally, both exhibit branching morphologies that provide important habitat for other reef organisms; no other Caribbean reef-building coral species is able to fulfill these ecosystem functions. At the current reduced abundance of *A. palmata* and *A. cervicornis*, it is likely that both these ecosystem functions have been largely lost.





**Figure 1. Approximate range of *Acropora* sp. (highlighted), including the Gulf of Mexico, Atlantic Oceans, and Caribbean Sea. The highlighted areas are not specific locations of the corals, but rather reflect general distributions (*Acropora* Biological Status Review 2005).**

Both elkhorn and staghorn corals underwent precipitous declines in abundance in the early 1980s throughout their range, and this decline has continued. Although quantitative data on former distribution and abundance are scarce, in the few locations where quantitative data are available (i.e., Florida Keys, Dry Tortugas, Jamaica, and U.S.V.I.), declines in abundance are estimated at greater than 97 percent. Although this decline trend has been documented as continuing in the late 1990s, and even in the past 5 years in some locations, local extirpations (i.e., at the island or country scale) have not been documented. While recruitment of new colonies has been reported in various geographic locations, new recruits appear to be suffering mortality faster than they can mature (to sizes greater than 1 m in colony diameter). In a very few locations (e.g., Buck Island Reef National Monument) moderate recovery of elkhorn coral appears to be progressing. In most cases the genetic origin of the recruits, presumably from sexual reproduction, is unknown so that their contribution to the corals' Caribbean-wide recovery remains undetermined.

On March 4, 2004, the Center for Biological Diversity (CBD) petitioned NMFS to list three *Acropora* species, elkhorn, staghorn, and fused-staghorn coral (*A. prolifera*), as either threatened or endangered under the ESA and to designate critical habitat. On June 23, 2004, NMFS made a positive 90-day finding (69 FR 34995) that CBD presented substantial information indicating that the petitioned actions may be warranted and announced the initiation of a formal status review by convening an Atlantic *Acropora* Biological Review Team (BRT). Their status review (available at <http://sero.nmfs.noaa.gov/pr/protres.htm#acropora>) incorporates and summarizes the best available scientific and commercial data available and addresses the status of the species, the five ESA listing factors, and current regulatory, conservation and research efforts.

On March 3, 2005, NMFS made a determination that both elkhorn and staghorn corals are likely to become in danger of extinction throughout all of their range in the foreseeable future from a combination

of factors. NMFS relied on the status review developed by the BRT in coming to these conclusions. After publishing a proposed rule in May 2005 and after reviewing public comments received, NMFS published a final rule listing these two coral species as threatened under the ESA on May 9, 2006 (71 FR 26852).

Species listed as *endangered* have several prohibitions automatically imposed under section 9 of the ESA. Species listed as *threatened* do not automatically receive these protective prohibitions. Section 4(d) of the ESA authorizes the Secretary of Commerce to “issue such regulations as he deems necessary and advisable to provide for the conservation of such species.” Section 4(d) regulations may prohibit, with respect to threatened species, some or all of the actions that section 9(a)(1) of the ESA prohibits with respect to endangered species. Both the ESA section 9(a)(1) prohibitions and section 4(d) regulations apply to all individuals, organizations, and agencies subject to United States jurisdiction.

When take of listed species is prohibited, the ESA allows NMFS to permit an otherwise prohibited take<sup>1</sup> under certain circumstances. Federal agency actions require consultation with NMFS if the activity may affect a listed species or its critical habitat (section 7(a)(2)). As a result of the consultation, NMFS may issue an “incidental take statement (ITS),” which sets forth the level of take allowed. If the action is likely to jeopardize the continued existence of the species<sup>2</sup>, then NMFS must identify reasonable and prudent alternatives (RPAs) to avoid jeopardizing the species. Additionally, NMFS may issue reasonable and prudent measures (RPMs) determined necessary or appropriate to minimize the impact of take of the species. For all other actions contemplated by non-federal actors, section 10 of the ESA gives NMFS authority to issue permits for direct take (section 10(a)(1)(A) permit for scientific research/enhancement) or incidental take (section 10(a)(1)(B) permit) for otherwise lawful activities.

## Purpose and Need for Action

The purpose of this action is to provide for the conservation of elkhorn and staghorn coral, now listed as threatened, under the authority of section 4(d) of the ESA.

This action is needed because, in the absence of a 4(d) rule, the ESA section 9(a)(1) prohibitions do not apply to threatened elkhorn and staghorn coral. NMFS finds that these prohibitions, with the exceptions described below, are necessary and advisable to provide for the conservation of these coral species. In developing the final listing determinations for the two coral species, NMFS evaluated existing regulatory mechanisms currently in place and consisting of enforceable provisions which are directed at managing threats to elkhorn and staghorn corals (71 FR 266852). NMFS concluded that current state and local regulations, voluntary efforts, and limitations on federal actions under the ESA and other federal laws have not totally abated the impact of stressors on threatened elkhorn and staghorn corals.

This EA will enable NMFS to determine whether there are likely to be significant impacts on the human environment from implementing any of four alternatives (including a no action alternative) for extending the ESA section 9(a)(1) prohibitions to threatened corals in Florida, Puerto Rico, and U.S.V.I. This analysis considers both the negative and positive impacts of these four alternatives. This EA will also be used by NMFS as the basis for either a finding of no significant impact (FONSI) or for the preparation of an environmental impact statement (EIS). Significance is evaluated in terms of both the context and intensity of a proposed action. The context for this proposed action includes the coral reef ecosystems of

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<sup>1</sup> “Take” is defined under section 9(a)(1) to mean, “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, import or export, ship in interstate commerce in the course of commercial activity, or see or offer for sale in interstate or foreign commerce any wildlife species listed as endangered, without written authorization.”

<sup>2</sup> “Jeopardize the continued existence of” is defined under 50 CFR 402.02 as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing reproductions, numbers, or distribution of that species.”

the Caribbean in which elkhorn and staghorn corals exist, and the interests of user groups that either benefit from the existence of and protections for these corals or are impacted by such protections.

## **Preferred Alternative**

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NMFS proposes to promulgate an ESA 4(d) rule for threatened elkhorn and staghorn corals that extends all of the prohibitions enumerated in section 9(a)(1) of the ESA to elkhorn and staghorn corals, except the section 9(a)(1)(A), (B), and (C) prohibitions for specified categories of activities that contribute to the conservation of listed corals. The environmental and social baseline for the analysis in this EA is the existing physical and biological conditions for listed corals, and the regulatory landscape that exists now that the listing determinations have taken effect.

## **DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

This chapter describes the alternative regulatory measures considered for extending the section 9(a)(1) prohibitions to two threatened coral species. This section also identifies the preferred alternative.

### **Alternatives**

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#### **Alternative 1**

##### ***No Action***

The no action alternative is the physical and biological status quo, and presents the environmental and social baseline upon which to measure the effects of taking any action, including implementation of the alternatives. Under the no action alternative, none of the prohibitions under section 9(a)(1) of the ESA would be extended to provide for the conservation of the two coral species. Current programs would continue to guide management of the two threatened coral species. ESA section 7 consultations on federal agency actions would only address whether an action jeopardizes the continued existence of elkhorn and staghorn corals. RPAs would only be imposed if federal agency actions that take listed corals were likely to jeopardize the continued existence of either coral species. RPMs to minimize the impact of take would not be available under this alternative because RPMs are only imposed if take of listed corals is prohibited. ESA section 10 permits would not be required for non-federal actions that take corals because take of the two species would not be prohibited.

Currently, most existing regulatory mechanisms manage coral or coral reefs in general and are not specific to the two threatened coral species. NMFS concluded in its final listing determinations that existing regulations have not totally abated the impact of stressors on threatened elkhorn and staghorn corals (71 FR 26852). Thus, under the no action alternative, no action would be taken to address the threats and stressors affecting these two coral species.

#### **Alternative 2**

##### ***The Preferred Alternative***

Under the preferred alternative, NMFS would promulgate a 4(d) rule that extends all of the prohibitions enumerated in section 9(a)(1) of the ESA to elkhorn and staghorn corals, except the section 9(a)(1)(A), (B), and (C) prohibitions for specified categories of activities that contribute to the conservation of listed corals.

The ESA section 9(a)(1) prohibitions, in part, make it unlawful, with regard to endangered species, for any person subject to the jurisdiction of the United States to:

- (A) Import any such species into, or export any such species from the United States;
- (B) Take any such species within the United States or the territorial sea of the United States;
- (C) Take any such species upon the high seas;
- (D) Possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such species taken in violation of subparagraphs (B) and (C);
- (E) Deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of a commercial activity, any such species;
- (F) Sell or offer for sale in interstate or foreign commerce any such species; or
- (G) Violate any regulation pertaining to such species or to any threatened species of fish or wildlife listed pursuant to section 1533 of this title and promulgated by the Secretary pursuant to authority provided by this chapter.

Section 11 of the ESA provides for civil and criminal penalties for violation of section 9(a)(1) or of regulations issued under the ESA.

There are two specific exceptions to the section 9(a)(1)(A), (B), and (C) prohibitions included in the preferred alternative.

- ***Import, export, and take resulting from scientific research and enhancement activities conducted under six specific existing Federal, state, or territorial research permitting programs.*** Several Federal, state, and territorial natural resource management agencies permit scientific research and enhancement activities, including monitoring and other studies that are directed at, and occur within the geographic areas occupied by, the listed corals. Any import, export, or take resulting from scientific research permitted by these agencies would be excepted by NMFS in the proposed 4(d) rule from the ESA section 9(a)(1)(A), (B), and (C) prohibitions; and
- ***Take resulting from certain restoration activities carried out by an authorized (under current laws) Federal, state, territorial, or local natural resource agency.*** Certain Federal, state, territorial, and local government agency personnel, or their designees as applicable, may take elkhorn or staghorn corals without a permit when they are performing specific restoration actions directed at listed corals under an existing legal authority that provides for such restoration. For purposes of this exception, we consider a “restoration activity” to be the methods and processes used to provide immediate aid to injured individuals. The activity that caused the injury would not be excepted by this rule. Through this exception, we are not authorizing any activities which are not currently authorized under an existing statute, rather we are excepting these activities from the section 9(a)(1)(B) and (C) prohibitions for the two listed corals.

Scientific research and enhancement activities are excepted from the ESA section 9(a)(1)(A) prohibition on import and export because a researcher may need to import samples collected in a foreign country for analysis within the U.S. Similarly, a researcher may export samples collected in the U.S. to a colleague in a foreign country. Including this exception in the preferred alternative relieves researchers of the requirement to obtain an ESA 10(a)(1)(A) permit for import or export of elkhorn or staghorn samples or specimens. In contrast, the exception to the ESA section 9(a)(1)(A) prohibition is not provided in the restoration activities exception, because of the narrow scope of the excepted activities (i.e., reattaching fragments in the area of injury).

In addition to the proposed exceptions described above, the ESA provides specific procedures for obtaining authorization for prohibited take through either interagency consultation as prescribed by ESA section 7 or a permit as prescribed by ESA section 10. All other activities that result in take of listed corals may be punishable by civil or criminal penalties and fines as stipulated by section 11 of the ESA. Such activities may include (but are not limited to) physical breakage due to recreational or commercial boating, fishing, diving, or snorkeling activities.

NMFS developed the preferred alternative after considering, among other things the verbal and written input received during seven public information-gathering workshops held during May 2006 in Florida, Puerto Rico, and U.S.V.I. We deemed the prohibitions included in this alternative necessary and advisable to provide for the conservation of threatened corals; given the nature, breadth, and synergism of threats and stressors affecting the status of these species, we determined that extending the ESA section 9 prohibitions would allow us to address those threats and stressors that are most amenable to management. Further, the exceptions included in this alternative contribute to the conservation of listed corals because these are activities that are beneficial to these species. Scientific research and enhancement activities improve our understanding of the status of and risks facing these threatened corals, and provide critical information for assessing the effectiveness of current and future management practices. Restoration activities increase the survivorship of injured fragments and prevent the further decline of each species.

### Alternative 3

#### ***4(d) Rule Extending All Section 9 Prohibitions, With Import, Export, and Take Exceptions For Specific Activities, Including Those Conducted Under Approved Resource Management Plans (RMPs)***

Under alternative 3, NMFS would promulgate a 4(d) rule that would extend all of the ESA section 9(a)(1) prohibitions to elkhorn and staghorn corals, with the same exceptions specified for the preferred alternative and an additional exception for activities carried out pursuant to a NMFS approved RMP that provides a net benefit to the two coral species. Subject to these exceptions, extension of these prohibitions would make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce threatened corals, unless written authorization for incidental take is obtained. It would also be illegal under ESA section 9(a)(1) to possess, sell, deliver, carry, transport, or ship any threatened coral that have been taken illegally. Section 11 of the ESA provides for civil and criminal penalties for violation of section 9(a)(1) or of regulations issued under the ESA.

This alternative includes exceptions to the section 9(a)(1)(A), (B), and (C) prohibitions for specific activities that contribute to the conservation of listed corals. The exceptions included in this alternative are:

- ***Import, export, and take resulting from scientific research and enhancement activities conducted under six specific existing Federal, state, or territorial research permitting programs.*** Several Federal, state, and territorial natural resource management agencies permit scientific research and enhancement activities, including monitoring and other studies that are directed at, and occur within the geographic areas occupied by, the listed corals. Any import, export, or take resulting from scientific research permitted by these agencies would be excepted by NMFS in the proposed 4(d) rule from the ESA section 9(a)(1)(A), (B), and (C) prohibitions;

- **Take resulting from certain restoration activities carried out by an authorized (under current laws) Federal, state, territorial, or local natural resource agency.** Certain Federal, state, territorial, and local government agency personnel, or their designees as applicable, may take elkhorn or staghorn corals without a permit when they are performing specific restoration actions directed at listed corals under an existing legal authority that provides for such restoration. For purposes of this exception, we consider a “restoration activity” to be the methods and processes used to aid injured individuals. The activity that caused the injury would not be excepted by this rule. Through this exception, we are not authorizing any activities which are not currently authorized under an existing statute, rather we are excepting these activities from the section 9(a)(1)(B) and (C) prohibitions for the two listed corals; and
- **Take resulting from activities conducted in accordance with a federal, state, territorial, or local RMP.** An RMP prescribes broad, multiple-use guidance for managing public lands and waters. Examples of RMPs include fishery management plans and national marine sanctuary management plans. Under this alternative, in addition to exceptions for direct take of corals (i.e., scientific research and enhancement or restoration activities), exceptions to the ESA section 9(a)(1)(B) and (C) prohibitions for incidental take<sup>3</sup> are included. Incidental take that results from activities conducted under an RMP is excepted only if a RMP specifically manages for the conservation of elkhorn and staghorn corals, provides a net conservation benefit to both species, and is approved by NMFS according to specific criteria.

Scientific research and enhancement activities are excepted from the ESA section 9(a)(1)(A) prohibition on import and export because a researcher may need to import samples collected in a foreign country for analysis within the U.S. Similarly, a researcher may export samples collected in the U.S. to a colleague in a foreign country. Including this exception relieves researchers of the requirement to obtain an ESA 10(a)(1)(A) permit for import or export of elkhorn or staghorn samples or specimens. In contrast, the exception to the ESA section 9(a)(1)(A) prohibition is not provided in the restoration activities exception, because of the narrow scope of the excepted activities (i.e., reattaching fragments in the area of injury). Similarly, activities conducted in accordance with an RMP do not require the import or export of listed coral specimens, therefore these activities are not excepted from the ESA section 9(a)(1)(A) prohibition.

In addition to the proposed exceptions described above, the ESA provides specific procedures for obtaining authorization for prohibited take through either interagency consultation as prescribed by ESA section 7 or a permit as prescribed by ESA section 10. All other activities that result in take of listed corals may be punishable by civil or criminal penalties and fines as stipulated by section 11 of the ESA. Such activities may include (but are not limited to) physical breakage due to recreational or commercial boating, fishing, diving, or snorkeling activities.

Like the preferred alternative, NMFS developed alternative 3 after considering the verbal and written input received during seven public information-gathering workshops held during May 2006 in Florida, Puerto Rico, and U.S.V.I. and after conducting discussions among federal and state/territorial resource management agency staff. We deemed the prohibitions included in this alternative necessary and advisable to provide for the conservation of threatened corals. The exceptions included in this alternative provide for the conservation of listed corals because these are activities that contribute to the conservation of these species. Scientific research and enhancement activities improve our understanding of the status of and risks facing these threatened corals, and provide critical information for assessing the effectiveness of current and future management practices. Restoration activities increase the survivorship of injured fragments and increase the abundance of each species. Last, this alternative would foster partnership opportunities between federal, state/territorial, and local agencies by encouraging these entities and

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<sup>3</sup> “Incidental take” refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or its applicant (50 CFR 402.22).

NMFS to work together to develop “*Acropora* species-friendly” RMPs that provide for the conservation of listed corals, even though a certain amount of incidental take may occur.

## Alternative 4

### **4(d) Rule Extending All ESA Section 9 Take Prohibitions, Without Exceptions**

Under alternative 4, NMFS would promulgate a 4(d) rule that extends all of the ESA section 9(a)(1) prohibitions to elkhorn and staghorn corals, *without* including any exceptions. Any federally funded, authorized, or conducted activities that may affect either of the two listed coral species already subject to the consultation requirements of ESA section 7 could potentially be required to implement RMPs specified as necessary or appropriate to minimize the impact of incidental take on the two coral species. All scientific research, restoration, and emergency response activities would require ESA section 10 permits to authorize take of listed species (see [Alternative 2](#)). All other activities that result in take of listed corals may be punishable by civil or criminal penalties and fines as stipulated by section 11 of the ESA. Such activities may include (but are not limited to) physical breakage due to recreational or commercial boating, fishing, diving, or snorkeling activities.

## AFFECTED ENVIRONMENT

There are three broad categories that NMFS uses to evaluate environmental impacts of proposed actions: physical, biological, and socioeconomic. The physical environment includes geographic, oceanographic, and climatic factors. The biological environment includes status and distribution of marine species, prey species, and life history information. The analysis of the socioeconomic environment includes effects on affected economic sectors of the community from regulatory actions and any interrelated or additional social impacts. This description of the affected environment provides a view on current conditions and serves as a baseline against which to compare impacts of implementing the alternatives.

### Physical Environment

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#### **Geographic Factors**

The physical environment in which the alternatives would be implemented consists of the entire ranges of the two species. The two coral species occur throughout the Caribbean. However, the alternatives presented above only apply to persons under the jurisdiction of the U.S. Therefore, the affected environment would include Florida, Puerto Rico, the U.S.V.I, the high seas (see [Background](#) for a map of the current ranges of elkhorn and staghorn corals).

Within the affected environment, these corals’ distribution includes a number of special management areas. Several reserves, sanctuaries, and national parks under state, territorial, and/or federal regulation harbor elkhorn and staghorn corals, including (but not limited to) the following:

- Florida Keys National Marine Sanctuary (Florida) – Federal
- Biscayne National Park (Florida) – Federal
- John Pennecamp Coral Reef State Park (Florida) – State
- Biscayne Bay Aquatic Preserve (Florida) – State
- John U. Lloyd Beach State Park (Florida) – State
- Buck Island Reef National Monument (St. Croix, U.S.V.I.) – Federal

- East End Marine Park (St. Croix, U.S.V.I.) – Territorial
- Virgin Islands Coral Reef National Monument (St. John, U.S.V.I.) – Federal
- Tres Palmas Reserve (Puerto Rico) – Territorial
- Isla de Mona Natural Reserve (Puerto Rico) – Territorial
- Arrecifes de Guayama Natural Reserve (Puerto Rico) – Territorial
- Arrecifes de la Cordillera Natural Reserve (Fajardo, Puerto Rico) – Territorial
- Punta Guaniquilla Natural Reserve (Cabo Rojo, Puerto Rico) – Territorial
- Canal Luis Peña Natural Reserve (Culebra, Puerto Rico) – Territorial
- Isla de Desecho Marine Reserve (Puerto Rico) – Territorial
- La Parguera Natural Reserve (Puerto Rico) – Territorial
- Navassa Island National Wildlife Refuge (Puerto Rico) – Federal

### **Oceanographic Factors**

In general, both coral species require hard, consolidated substrate (i.e., hardbottom and attached, dead coral skeleton) for their larvae to settle or fragments to reattach (70 FR 24359). They also require relatively clear, well-circulated, and nutrient-limited water at temperatures ranging from 25° to 29°C. Elkhorn coral colonies have an optimal depth range of 1 to 5 meters and are found on the seaward face of a reef (turbulent shallow water), including the reef crest, and shallow spur and groove zone. Generally, colonies of staghorn coral are found in more protected, deeper water or seaward of elkhorn coral colonies, commonly in water depths ranging from 5 to 15 meters (*Acropora* BRT 2005).

These corals are particularly susceptible to increases in water turbidity and water temperature. *Acropora* sp. appear to be particularly sensitive to sediment rain and shading effects from increased sediment regimes. They are almost entirely dependent on sunlight for nourishment and may not be able to compensate with an alternate food source, such as phytoplankton and suspended particulate matter, when long-term water clarity is reduced. Thus, high sediment loads can have lethal and sub-lethal effects on both elkhorn and staghorn corals.

### **Climatic Factors**

These species are prone to bleaching after prolonged exposure to increased sea surface temperatures. At any location, a bleaching threshold can be determined at a degree or two above the long-term seasonal maximum. Bleaching (zooxanthellae loss) can affect coral growth, maintenance, reproduction, and survival. Mass bleaching events occurred in the 1980s and 1990s, and during the past quarter century, bleaching events have become more frequent, are spatially more widespread, and the impacts are more intense (*Acropora* BRT 2005).

## **Biological Environment**

### **Status of Threatened Coral Species**

The life history, status and trends, and threats and stressors for threatened corals are briefly presented below. These aspects are discussed in detail in the *Atlantic Acropora Status Review* published on March 3, 2005 (*Acropora* BRT 2005) and in the proposed and final listing rules published in the *Federal Register* (70 FR 24359 and 71 FR 26852, respectively). These documents are herein incorporated by reference and are available on the NMFS Southeast Regional Office website (<http://sero.nmfs.noaa.gov/pr/protres.htm>).



Elkhorn and staghorn corals undergo both sexual (i.e., production of larvae) and, probably more commonly, asexual (i.e., fragmentation of branches can yield new attached and growing colonies) reproduction. Sexual recruitment is limited in some areas and unknown in most; fertilization success from clones (i.e., asexual fragments) is virtually zero; settlement of larvae is often unsuccessful, given limited amount of appropriate habitat; and fertilization success is declining as a result of greatly reduced densities of adult colonies (the Allee effect). In the few locations where quantitative data on distribution and abundance are available (e.g., Florida Keys, Dry Tortugas, Belize, Jamaica, and U.S.V.I.), declines in abundance (coverage and colony numbers) are estimated at >97% (*Acropora* BRT 2005).

The threats and stressors contributing to the decline in abundances of elkhorn and staghorn corals include the following: disease, temperature-induced bleaching, physical damage from hurricanes, anthropogenic physical damage (e.g., fishing gear interactions, vessel groundings, anchors, divers and snorkelers), coastal development (including dredge and fill activities), competition, and predation. Managing for some or all of these threats and stressors may enhance coral condition and decrease synergistic stress effects, thereby decreasing the rate of species decline.

The status review and the listing determinations concluded that elkhorn and staghorn corals are not in danger of extinction throughout their ranges. However, they are likely to become so within the foreseeable future because of a combination of four of the five factors listed in section 4(a)(1) of the ESA, and this status is not being ameliorated by efforts to protect the species by the state or foreign governments.

### **Other Affected Species**

It is important to note that threatened elkhorn and staghorn corals are the only large, branching coral species in Caribbean reef systems capable of creating large amounts of complex reef habitat (*Acropora* BRT 2005). As such, they serve as fish habitat (Ogden and Erlich 1977, Appeldoorn et al. 1996), including essential fish habitat (CFMC 1998), for species of economic and ecological importance. To illustrate, significantly higher abundances of grunts (Haemulidae), snappers (Lutjanidae), and sweepers (Pempheridae) were reported for high-topography areas with coverage by elkhorn corals, compared to lower topography or lower coral cover sites (Lirman 1999). Comparisons between sites where elkhorn corals were absent and present suggested that fish schools, comprised primarily of grunts and snappers, used elkhorn coral colonies preferentially. Additionally, Hill (2001) indicated that staghorn coral thickets were the preferred settlement habitat for grunts, which became saturated during high recruitment seasons; consequently the fish needed to use potentially sub-optimal habitats nearby (e.g., seagrass or gorgonians). Last, the threats and stressors affecting elkhorn and staghorn corals are also those affecting the longevity of other coral species that comprise the Caribbean coral reef complex. Managing for some or all of these threats and stressors may enhance the condition of coral reefs, in general.

Last, there are several other ESA-protected species known to occur within the same ranges as elkhorn and staghorn corals, including five species of sea turtles (green, hawksbill, Kemp's ridley, leatherback, and loggerhead), the smalltooth sawfish, and Johnson's seagrass. These species may benefit the implementation of RPMs that minimize the impact of take of the listed corals. Leatherback, hawksbill, Kemp's ridley, the Florida population of green turtles, and the smalltooth sawfish are endangered under the ESA. Loggerhead turtles and Johnson's seagrass are threatened.

A thorough review of the life history, status and trends, and threats for sea turtles is available in section 3.2 of the February 15, 2005 *Biological Opinion on the Continued Authorization of Reef Fish Fishing Under the Gulf of Mexico Reef Fish Fishery Management Plan and Proposed Amendment 23* (NMFS 2005), and that section is herein incorporated by reference. This document can be obtained through the NMFS Southeast Regional Office. Additional information can be found in the recovery plans for each species, available in the NMFS website and herein incorporated by reference:

- Green turtle: [http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle\\_green\\_atlantic.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_atlantic.pdf)

- Hawksbill: [http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle\\_hawksbill\\_atlantic.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_hawksbill_atlantic.pdf)
- Kemp's ridley: [http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle\\_kempsridley.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_kempsridley.pdf)
- Leatherback: [http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle\\_leatherback\\_atlantic.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_leatherback_atlantic.pdf)
- Loggerhead: [http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle\\_loggerhead\\_atlantic.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_loggerhead_atlantic.pdf)

A review of the life history, status and trends, and threats for smalltooth sawfish is available in the December 2000 *Status Review for the Smalltooth Sawfish (Pristis pectinata)* (NMFS 2000) and that document is herein incorporated by reference. This document is available online at <http://www.nmfs.noaa.gov/pr/pdfs/statusreviews/smalltoothsawfish.pdf>.

Last, a review of the life history, status and trends, and threats for Johnson's seagrass is available in the October 15, 1997 *Updated Biological Status Review and Summary of the Proceedings of a Workshop to Review the Biological Status of the Seagrass, Halophila johnsonii* Eiseman (NMFS 1997) and is herein incorporated by reference. This document is available online at <http://www.nmfs.noaa.gov/pr/pdfs/statusreviews/johnsonsseagrass.pdf>.

## Socioeconomic Environment

The area in which the alternatives would be implemented consists of federal, state, and territorial waters off of Florida, Puerto Rico, and U.S.V.I. The Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA) included in this EA (see [Appendix A](#)) describe, in detail, the affected socioeconomic resources within the area. A summary of these affected resources is provided below.

Elkhorn and staghorn corals occur in shallow inshore waters off of four Florida Counties (Palm Beach County, Broward County, Miami-Dade County, and Monroe County), Puerto Rico, and U.S.V.I. Tourism is important to all the regional economies where these corals are found. A survey conducted for the U.S.V.I. DPNR found that 100 percent of hotel industry participants answered that there would be a significant impact on tourist visits to the U.S.V.I. if the coast/beaches were degraded or fisheries and/or coral reefs declined (U.S.V.I. 2003). Johns et al. (2003) estimated that direct use of natural reefs in four counties of South Florida (Broward, Miami-Dade, Monroe, and Palm Beach) by both residents and visitors from June 2000 to May 2001 was equivalent to 18.4 million person-days of snorkeling, SCUBA diving, fishing and viewing coral reefs from glass-bottom boats, which brought in over \$2.7 billion in output/sales, and which further generated over \$1.2 billion in income that supported over 43,000 full-time and part-time jobs. Coral reefs provide shoreline protection by dissipating the force of waves that is a major source of erosion and loss of land (NOAA 2004), and have cultural and aesthetic values as well.

Coral reefs are home to 25 percent of all fish species and home to many commercial and recreational fishing species. In 2005, 82 percent of the total national catch in pounds of spiny lobster was taken from Florida waters where these corals are found. Over 3 million pounds of shallow water reef fish were landed by commercial fishermen in the Florida counties where these species occur with a dockside value of approximately \$5.9 million in 2005. That same year, 771,656 pounds of shallow water reef fish were landed in Puerto Rico with a dockside value of about \$1.8 million, and over 1.2 million pounds were commercially landed with a dockside value of about \$3.9 million in the U.S.V.I.

Several existing laws and regulations at the federal, state, and territorial levels already restrict activities that would be prohibited under any of the alternatives. These laws and regulations include limits on destruction (including water quality standards), collection, possession, sale, delivery, transportation, or shipment of either of the threatened coral species. These laws and regulations are discussed in greater detail in the RIR and IRFA (see [Appendix A](#)).

# ENVIRONMENTAL CONSEQUENCES

This section describes and analyzes the anticipated environmental consequences of implementing the preferred alternative and other alternatives on the resources described in the *Affected Environment* section. It also presents the scientific and analytical basis for comparison of alternatives (see [Table 1](#)).

## Physical Environment

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### Alternative 1

#### **No Action**

This alternative would not change the nature of any use of the environment, so implementation of this alternative is not expected to cause additional degradation of the physical environment.

### Alternatives 2 – 4

These alternatives are not expected to cause additional degradation of the physical environment. It is expected that these alternatives would have positive impacts on the physical environment of listed corals and other affected species, including other coral species through imposition of RPMs in ESA section 7 consultations.

For listed species, section 7(a)(2) requires federal agencies to ensure that activities they authorize, fund, or conduct are not likely to jeopardize the continued existence of a listed species. If a federal action may affect a listed species, the responsible federal agency must enter into consultation with NMFS. Examples of federal actions likely to affect elkhorn and staghorn corals include the U.S. Army Corps of Engineers (USACE) permitting activities under section 404 of the Clean Water Act, USACE permitting activities under the River and Harbors Act, and the U.S. Environmental Protection Agency (USEPA) implementation of the National Pollution Discharge Elimination System (NPDES) Permit Program for point sources. Activities permitted under these regulations include (but are not limited to): in-water construction projects (e.g., piers, docks, and marinas); dredging that is not considered maintenance of existing navigation channels (new dredging); live rock aquaculture; and beach nourishment projects.

If any of these alternatives were implemented, then take of listed corals (subject to the exceptions for each alternative) would be prohibited. The ESA allows NMFS to permit an otherwise prohibited take under section 7(a)(2) through the issuance of an ITS, which sets forth the level of take allowed. The ITS must specify the RPMs that NMFS considers necessary or appropriate to reduce the impacts of expected take. It also sets forth the terms and conditions for implementing RPMs, including (but not limited to) reporting requirements, with which the Federal action agency or applicant must comply. RPMs, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or timing of the action and may only involve minor changes (50 CFR 402.15(i)(2)).

RPMs that NMFS may issue for the activities listed above include: relocation of listed corals away from the project area, and the subsequent monitoring of the relocated corals; pre- and post-construction monitoring of corals near the project area; the use of turbidity control devices; anchoring of cables during storm events; and prior to harvest and sale of live rock – transplanting listed corals that may have recruited on live rock. Thus, the issuance of RPMs is expected to result in positive impacts on the physical environment (i.e., improved water quality conditions) for listed corals and all other affected species such as other corals.

## Biological Environment

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### Alternative 1

#### *No Action*

Under the no action alternative, none of the prohibitions under section 9(a)(1) of the ESA (including prohibitions on take) would be extended to the two coral species. This alternative is not expected to slow the rate of declines in the two corals' abundances because of a number of unabated threats and stressors. Continued declines in abundances of elkhorn and staghorn corals would result in decreased habitat for ecologically and economically important reef fishes, including grunts and snappers. This alternative would not provide for the conservation of threatened elkhorn and staghorn corals nor would it provide benefits to other biological resources within the affected environment, including other corals in the Caribbean coral reef complex.

### Alternative 2

#### *Preferred Alternative*

This alternative extends all ESA section 9(a)(1) prohibitions to elkhorn and staghorn corals, with exceptions to the import, export, and/or take prohibitions included for specific activities. Implementation of this alternative would provide protection under the ESA deemed necessary and advisable to provide for the conservation of threatened corals. This alternative would have beneficial effects on elkhorn and staghorn corals and on other affected species, including other coral species and ecologically and economically important reef fishes, which utilize the complex reef habitat provided by listed corals.

Particularly, the ESA prohibitions extended by this alternative would limit the adverse effects of actions funded, authorized, or carried out by federal agencies on the two threatened coral species. Such actions include (but are not limited to) upland and coastal construction, dredge and fill activities, live rock aquaculture, and interactions of fishing gear with threatened corals. Currently, under ESA section 7, federal agencies must consult with NMFS when any action may affect threatened corals. However, this alternative would not only require an analysis of whether a federal action would jeopardize the continued existence of the species, it would require issuing RPMs specified as necessary or appropriate to minimize the impacts of incidental take of threatened corals resulting from these federal actions. Avoiding and reducing impacts to these corals is also expected to limit the effects of federal actions on other affected species in the federal action area.

Additionally, this alternative would result in a net reduction of the intensity of the stressors and threats contributing to the decline in abundance of the two corals by prohibiting activities that constitute take under ESA sections 9(a)(1)(B) and 9(a)(1)(C). Activities that may result in take of either of the two threatened corals, include (but are not limited to) physical breakage due to recreational or commercial boating, fishing, diving, or snorkeling activities. Similarly, this alternative would extend the prohibitions under ESA sections 9(a)(1)(A), (D), (E), and (F). These provisions prohibit such activities as import, export, and all other trade and commercial activities. Prohibiting take that results from these activities would provide for the conservation of threatened corals and assist in their recovery.

Last, the exceptions to the ESA section 9(a)(1) prohibitions included in this alternative allow some import, export, and take of listed corals for scientific research and enhancement and restoration activities. The impact of allowing some take is expected to be minor and to provide a net conservation benefit for these coral species. Particularly, scientific research and enhancement activities improve our understanding of the status of and risks facing these threatened corals, and provide critical information for assessing the effectiveness of current and future management practices. Moreover, the take that would occur under this exception will be limited to activities conducted under specific research and permitting

programs that strictly restrict the adverse impacts allowed to the resources being studied. Restoration activities increase the survivorship of injured fragments and prevent further decline in the abundance of each species.

### **Alternative 3**

#### ***4(d) Rule Extending All Section 9 Prohibitions, With Import, Export, and/or Take Exceptions For Specific Activities, Including Those Conducted Under Approved Resource Management Plans (RMPs)***

Similar to the preferred alternative, this alternative would have beneficial effects on elkhorn and staghorn corals and on other affected species, including other coral species and ecologically and economically important reef fishes. This alternative would result in a net reduction of the intensity of the stressors and threats contributing to the decline in the two corals' abundance by prohibiting most activities that constitute take under ESA sections 9(a)(1)(B) and 9(a)(1)(C). Additionally, the issuance of RMPs under ESA section 7 would limit the effects of federal actions on threatened corals by modifying actions where necessary or appropriate to minimize take of the affected species.

In addition to the exceptions included in the preferred alternative, this alternative includes an exception for incidental take of either of the two threatened coral species that results from activities conducted in accordance with a NMFS-approved federal, state, territorial, or local RMP. The incidental take resulting from the activities conducted under these RMPs is not expected to negatively affect the overall status of threatened corals or of other affected species because the RMPs would need to provide a net conservation benefit to the two listed coral species to qualify for the exemption. However, an increase in incidental take is expected under this alternative compared to the preferred alternative and alternative 4.

### **Alternative 4**

#### ***4(d) Rule Extending All ESA Section 9 Prohibitions, Without Exceptions***

This alternative also would result in a net reduction of the intensity of the stressors and threats contributing to the decline in abundance the two corals by extending the section 9(a)(1) prohibitions to the threatened corals. This alternative does not include exceptions for activities that result in take. This alternative would have beneficial effects on elkhorn and staghorn corals and on other affected species, including other coral species and ecologically and economically important reef fishes; however, this alternative would be expected to result in potential increased mortality of injured individuals of listed corals because immediate action to assist and restore injured corals would not be expected to occur without the exceptions included in the preferred alternative. Additionally, the requirement to obtain an ESA section 10(a)(1)(A) permit for scientific research and enhancement activities already permitted by existing programs may deter or delay research that would improve our understanding of the status and risks facing these threatened corals.

## **Socioeconomic Environment**

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The following is a brief discussion of the socioeconomic resources expected to be affected by the preferred alternative and other alternatives. A full discussion of the socioeconomic consequences that would result from each alternative is contained within the RIR and IRFA (see [Appendix A](#)).

## Alternative 1

### **No Action**

The no action alternative would generate no cost or benefit beyond the status quo. As currently listed species, both elkhorn and staghorn corals are protected under section 7 of the ESA. However, the status quo would be expected to result in greater levels of take of listed coral species than the other alternatives, because RPAs to federal actions would only be imposed through ESA section 7 when the take expected from a federal action is expected to jeopardize the continued existence of either coral species. Because take is not prohibited, RPMs would not be available to minimize the impact of federal actions where incidental take does not jeopardize the species' existence. Last, there is the likelihood of smaller future annual incomes generated directly and indirectly from person-days of snorkeling, SCUBA diving, fishing, and viewing coral reefs, and smaller other benefits because of continuing losses of these species expected under this alternative.

## Alternative 2

### **Preferred Alternative**

The preferred alternative would prohibit import or export of listed corals. Reports on the coral trade provide no evidence of current imports and exports of these two species of corals. Consequently, the ESA section 9 import and export prohibition is expected to have a negligible impact on existing international trade activities for elkhorn and staghorn corals.

The preferred alternative also would prohibit take of listed corals. Currently, federal agencies funding, authorizing, or carrying out actions that may affect listed coral species must consult with NMFS pursuant to ESA section 7. The extension of the ESA section 9 take prohibitions to elkhorn and staghorn corals means that federal action agencies would be required to comply with RPMs, and the terms and conditions of implementing those RPMs, to minimize the impact of take of listed corals that would result from an agency action. The RPMs, which are described by NMFS in an ITS following the completion of formal ESA section 7 consultation with the action agency, cannot alter the basic design, location, scope, duration, or timing of the proposed action and may involve only minor changes (50 CFR 402(i)(2)).

Costs of this rule, therefore, stem from project modifications (i.e., RPMs) resulting from the ESA section 7 consultation process. NMFS may issue RPMs for agency actions such as in-water construction projects (e.g., piers, docks, and marinas); dredging; live rock aquaculture; and beach nourishment projects. Examples of RPMs that NMFS may issue for these actions include: relocation of listed corals away from the project area, and the subsequent monitoring of the relocated corals; pre- and post-construction monitoring of corals near the project area; the use of turbidity control devices; anchoring of cables during storm events; and prior to harvest and sale of live rock – transplanting listed corals that may have recruited on live rock. Information obtained from USACE indicates that the RPMs identified above are already included as standard terms and conditions of USACE permits when any species of coral may be affected.

While the costs associated with project modifications can be characterized, no total cost of this rule can be identified. Although we made an assumption about the number of future ESA section 7 consultations (albeit an overestimation) likely to occur in the future, the lack of information on the specifics of project design limits our ability to forecast the type and amount of modification required. For example, NMFS may require the relocation and monitoring of all elkhorn and staghorn colonies within the direct footprint of all future projects. We do not know if either species will be present in proposed future action areas because we do not know the location of future action areas and whether coral will be present in the action area. Without this information it is impossible to estimate the number of days necessary to relocate and monitor an unknown number of corals. Additionally, as stated in the description of each project

modification and in Table 2-20 (see [Section 2.5.1](#) of Appendix A), many project modifications are currently required by other regulatory agencies to protect corals in general.

A number of existing federal, state, or local laws prohibit take, possession, or sale of, and/or damage to, corals. Puerto Rico and U.S.V.I. law prohibit the take and sale of elkhorn and staghorn corals. Florida law prohibits take of these corals, with an exception provided for corals that attach to rock placed by aquaculture operations that have the appropriate permits from the state, NMFS, and USACE. Florida law allows sales of elkhorn or staghorn corals skeletons with proof that the specimens were not taken illegally and sales of live rock that may contain elkhorn or staghorn coral that settled on and attached to that rock. No historical formal ESA section 7 consultations have involved live rock operations. However, reasonable and prudent measures may be necessary or appropriate to minimize the impact of incidental take of activities on the two listed corals.

The socioeconomic benefits of this alternative include the likely increase in annual income to regional economies generated directly and indirectly from person-days of snorkeling, SCUBA diving, fishing and viewing coral reefs, plus other benefits, such as shoreline protection. Small businesses in the tourist industry would likely benefit from the rule with increased direct and indirect use of coral reefs.

### **Alternative 3**

#### ***4(d) Rule Extending All Section 9 Prohibitions, With Import, Export, and/or Take Exceptions For Specific Activities, Including Those Conducted Under Approved Resource Management Plans (RMPs)***

Alternative 3 would have socioeconomic impacts similar to those described in [Alternative 2](#) above, including minor costs associated with the issuance of RMPs by NMFS under ESA section 7. However, the costs would be lower than Alternative 2 because agencies with an approved RMP would not be required to implement RMPs under ESA section 7. This alternative includes the exceptions proposed in the preferred alternative. Permittees are not required to obtain ESA section 10(a)(1)(A) direct take permits under the exceptions for scientific research and enhancement and restoration activities directed at either listed coral and conducted under NMFS-approved permit programs.

Additionally, this alternative includes incidental take exceptions for activities conducted in accordance with a NMFS-approved resource management plan (RMP). Entities engaged in activities that may result in incidental take of listed corals and that are managed by approved RMPs from would not be required to (a) obtain an ESA section 10(a)(1)(B) incidental take permit; (b) monitor incidental take of listed corals; and (c) report incidental take of listed corals. As a result of this exception, NMFS's ability to monitor and minimize incidental take of these corals species would be reduced, potentially resulting in greater take of listed corals. In turn, this could reduce the quality and quantity of goods and services that derive from elkhorn and staghorn coral reefs; and the income generated from the direct and indirect use of listed corals would be less than that generated by the Preferred Alternative. The income generated by this alternative would likely be greater than either Alternative 1 or Alternative 4.

### **Alternative 4**

#### ***4(d) Rule Extending All ESA Section 9 Prohibitions, Without Exceptions***

Alternative 4 would have socioeconomic impacts similar to those described in [Alternative 2](#) above, including costs associated with the issuance of RMPs by NMFS under ESA section 7; however, this alternative includes no exceptions to the ESA section 9 prohibitions. Therefore, any person conducting restoration or scientific research or enhancement activities directed at elkhorn or staghorn corals would be required to obtain an ESA section 10(a)(1)(A) permit. This process may be detrimental to listed corals in the event that either coral requires emergency (quick response) actions as a result of natural and technological disasters or other events that may injure listed corals, or if scientific research that would

increase our understanding of the listed corals were deterred or delayed. It is possible that the time lag would result in the mortality of listed corals, which would likely affect residents and visitors who make direct use of these reefs, and others who benefit indirectly from these reefs. The income generated by this alternative, however, would likely be greater than that generated by the no action alternative.

## Cumulative Impacts

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Cumulative impacts are those combined effects on the quality of the human environment that result from the incremental impact of the preferred alternative and other alternatives when added to other past, present, and reasonably foreseeable future actions, regardless of what federal or non-federal agency or person undertakes such actions. The purpose of the cumulative impacts analysis is to ensure that federal decisions consider the full range of an action's consequences, incorporating this information into the planning process.

None of the presented alternatives, when considered cumulatively with other federal, state, and territorial restrictions on take, import, export, and commercial trade of elkhorn and staghorn corals, are expected to place an undue burden on private actors. Many of the ESA section 9(a)(1) prohibitions extended to listed corals are for activities already prohibited by federal, state, or territorial law (e.g., collection or destruction of stony corals). Thus, the alternatives are expected to reinforce existing regulations, to discourage the development of a black market for the trade of elkhorn or staghorn corals, and to decrease synergistic, negative effects from other stressors.

The current environmental conditions for threatened corals discussed in the [Biological Environment](#) section of this document states NMFS' determination that, when considering the combined effects of past and ongoing federal, state/territorial, and local activities, most elkhorn and staghorn coral populations are declining and these corals are likely to become endangered within the foreseeable future. Therefore, the implementation of alternatives two, three or four, on top of the current baseline, would be expected to have a beneficial impact on threatened coral populations because these alternatives are expected to reduce the synergistic stress effects of activities adversely affecting the status of these corals. All of the alternatives except the [No Action](#) alternative will affirmatively contribute to the conservation of threatened corals. Additionally, all other affected species, including other coral species, are expected to benefit from the increased regulation of actions that may affect listed corals.

## Comparison of Alternatives

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This section provides a summary of the impacts of implementing each alternative. Information in the table is focused on activities and impacts where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.



**Table 1. Summary of the four alternative actions respecting ESA section 9(a)(1) prohibitions to provide for the conservation of elkhorn and staghorn corals.**

	<b>Physical Environment</b>	<b>Biological Environment</b>	<b>Socioeconomic Environment</b>
<b>Alternative 1 No Action</b>	No additional degradation.	Continued declines in listed species' and other corals' abundances in the Caribbean coral reef complex.  Decreased habitat for ecologically and economically important reef fishes.	Expected loss of future income because of loss of corals.
<b>Alternative 2 Preferred Alternative - Limited Exceptions to the ESA Section 9(a)(1) Prohibitions</b>	No additional degradation.  Positive impacts on the physical environment (i.e., improved water quality conditions) for listed corals, all other affected species, including other coral species because of the issuance of RPMs by NMFS under ESA section 7.	Beneficial effects on elkhorn and staghorn corals and on all other affected species from: <ul style="list-style-type: none"> <li>· Limiting effects of federal actions on listed corals;</li> <li>· Net reduction in intensity of stressors and threats that contribute to declines in listed corals' abundances, and that affect the longevity of other coral species in the Caribbean coral reef complex.</li> <li>· Fewer limits on research and restoration activities, which is expected to promote data collection to reduce impacts of stressors.</li> </ul>	Federal action agencies completing formal ESA section 7 consultations with NMFS must comply with RPMs.  Costs associated with ESA section 10(a)(1)(B) ITP process.  No increase in costs associated with ESA section 10(a)(1)(A) scientific research and enhancement permit process.  Expected increase in annual income to regional economies generated directly and indirectly from person-days of snorkeling, SCUBA diving, fishing, and viewing elkhorn and staghorn reefs plus other benefits that derive from corals reefs (i.e., shoreline protection).

<b>Alternative 3</b>	Same as Preferred Alternative.	Expected greater amounts of undocumented incidental take of listed corals than the Preferred Alternative; however, RMP must provide a net conservation benefit for listed corals.	Federal action agencies completing formal ESA section 7 consultations with NMFS must comply with RPMs, however RPMs not required for agencies with approved federal RMP, thus resulting in lower costs.
<b>Alternative 2 With Additional Exceptions</b>			Lesser costs associated with the ESA section 10 incidental permitting process expected than Preferred Alternative.
			No increase in costs associated with ESA section 10(a)(1)(A) scientific research and enhancement permit process.
			Smaller increase of annual income than the Preferred Alternative expected because of increased incidental take of listed corals (annual income increase expected to be larger than those expected for either Alternative 1 or 4).

<b>Alternative 4</b>	Same as Preferred Alternative.	Beneficial effects on elkhorn and staghorn corals and on all other affected species from:	Federal action agencies completing formal ESA section 7 consultations with NMFS must comply with RPMs.
<b>No Exceptions to the ESA Section 9(a)(1) Prohibitions</b>		<ul style="list-style-type: none"> <li>• Limiting effects of federal actions on listed corals;</li> <li>• Net reduction in intensity of stressors and threats that contribute to declines in listed corals' abundances, and that affect the longevity of other coral species in the Caribbean coral reef complex.</li> </ul>	Additional costs associated with ESA section 10 permitting process expected for scientific research and enhancement and restoration activities excepted under Alternatives 2 and 3.
		Required ESA section 10(a)(1)(A) permits may deter or delay some scientific research on listed corals or emergency response actions for injured specimens of listed corals.	Smaller incomes and other benefits than those of the Preferred Alternative because of limited ability for quick response actions to reduce listed coral mortality after an emergency.

We selected the preferred alternative because we deemed the prohibitions included in this alternative necessary and advisable to provide for the conservation of threatened corals. In addition, the exceptions included in this alternative contribute to the conservation of listed corals because these are activities that are beneficial to these species, and we believe these activities would be hindered or less effective in the absence of the exceptions. Scientific research and enhancement activities improve our understanding of the status of and risks facing these threatened corals, and provide critical information for assessing the effectiveness of current and future management practices. Restoration activities increase the survivorship of injured fragments and prevent the further decline in abundance of each species. We determined that the six federal, state, and territorial natural resource management programs that permit scientific research and enhancement activities directed at elkhorn or staghorn corals are restrictive enough to provide for the conservation of these coral species without the additional requirements of ESA section 10(a)(1)(A) permits. Additionally, the costs of implementing this alternative are expected to be minor (i.e., Federal action agency and permittee costs associated with implementing imposed RPMs), whereas the benefits to the socioeconomic environment are expected to be greater than those of the other alternatives (see [section 2.5.2](#) of [Appendix A](#)).

We did not select Alternative 3 as the preferred alternative because this alternative would be expected to result in greater amounts of undocumented incidental take of listed corals from activities managed or authorized by RPMs. Even though an RMP must be approved by NMFS and provide a net benefit to the corals to qualify for the exemption, we believe that the corresponding reduction in NMFS' ability to monitor and minimize the take of listed corals through RPMs may be detrimental to the listed corals. Given the extremely low abundances of threatened elkhorn and staghorn corals and the myriad threats and stressors affecting them, we believe that the preferred alternative better provides for the conservation of listed corals than Alternative 3. Additionally, we did not select Alternative 4 because this alternative

would be expected to have potential negative impacts on listed corals. Alternative 4 does not include exceptions from the prohibitions for scientific research and enhancement activities or for certain restoration activities. Not including exceptions for these activities may deter or delay restoration of injured listed corals, or deter or delay research that would improve our understanding of the status and risks facing these threatened corals and provide critical information for assessing the effectiveness of current and future management practices.

## OTHER APPLICABLE LAW

### Marine Mammal Protection Act (MMPA) \_\_\_\_\_

This action would promulgate regulations specific to impacts on threatened corals and will not affect marine mammals.

### Regulatory Flexibility Act (RFA), Executive Order (E. O.) 12866, and Congressional Review Act \_\_\_\_\_

Congress passed the Regulatory Flexibility Act (RFA) to ensure federal agencies consider the impacts of regulations, taking into account the special needs and concerns of small businesses through an initial regulatory flexibility analysis. The IRFA analysis for this action demonstrates that none of the alternatives considered will have a significant economic impact on a substantial number of small entities. (see [Appendix A](#))

E.O. 12866 requires that the Office of Management and Budget (OMB) review proposed regulatory programs that are likely to be “significant.” NMFS complies with the E.O. through the preparation of a RIR for proposed rules. Based on this analysis (see [Appendix A](#)) in the draft EA prepared for this action, none of the alternatives considered have been determined to be significant for the purposes of the E.O.

The Small Business Regulatory Enforcement Fairness Act of 1996 added Chapter 8 to Title 5, United States Code, to provide for congressional review, and potential disapproval, of agency rulemaking. Agencies are required to certify to OMB whether actions are “major” for purposes of these provisions, which may delay publication of rules. This action was determined as “not major” for purposes of 5 U.S.C. 801 *et seq.*

### National Environmental Policy Act (NEPA) \_\_\_\_\_

NEPA requires federal agencies to assess the effects of major federal actions for significant impacts on the quality of the human environment through an environmental impact statement or EA. NMFS prepared this draft EA for the proposed action, which resulted in a finding of no significant impact in accordance with NEPA ([Appendix B](#)).

### Endangered Species Act (ESA) \_\_\_\_\_

The ESA imposes on all federal agencies a duty to ensure their actions do not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of the critical habitat of such species. To effectuate the ESA’s requirement to avoid jeopardy and adverse modification, the ESA requires the “action” agency to consult with an “expert” agency to evaluate the effects a proposed agency action may have on a listed species. If the action agency determines through preparation of a biological assessment or informal consultation the preferred alternative is “not likely to

adversely affect” listed species or critical habitat, formal consultation is not required so long as the expert agency concurs.

A formal consultation was conducted to evaluate the potential effects of this action on ESA-listed species, as required under section 7 of the ESA. In the biological opinion NMFS determined that the proposed action is not likely to adversely affect sea turtles and smalltooth sawfish, and will not jeopardize the continued existence of elkhorn and staghorn corals.

## **Coastal Zone Management Act (CZMA)** \_\_\_\_\_

NMFS determined the proposed regulations are consistent, to the maximum extent practicable, with the enforceable policies of the approved coastal zone management plans of coastal states and territories affected by the proposed rule (Florida, Puerto Rico, and U.S.V.I.). When this proposed rule is published, NMFS will send the proposed rule and consistency determination to each coastal state affected by the proposed action.

## **Paperwork Reduction Act (PRA)** \_\_\_\_\_

The purpose of the PRA is to minimize the paperwork burden for individuals, small businesses, educational and nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The preferred alternative does not contain a collection-of-information requirement for the purposes of the Paperwork Reduction Act.

## **Information Quality Act** \_\_\_\_\_

The rule making package has undergone a pre-dissemination review by the Protected Resources Division of the Southeast Regional Office, completed on July 20, 2007, which determined this information product complies with applicable information quality guidelines implementing the Information Quality Act (Section 515 of Public Law 106-554).

## **Essential Fish Habitat (EFH)** \_\_\_\_\_

Pursuant to the Magnuson-Stevens Act, federal agencies must undergo a consultation process regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH. The area affected by the preferred alternative was identified as EFH through several FMPs. However, the purpose of the preferred alternative is to protect elkhorn and staghorn corals. Protecting these species will add to protections already in place to protect coral reef habitats. Therefore, the proposed rule will have a net benefit on EFH.

## **E. O. 13132 (Federalism)** \_\_\_\_\_

Pursuant to the Executive Order on Federalism, E.O. 13132, the Assistant Secretary for Legislative and Intergovernmental Affairs will provide notice of the proposed action and request comments from the appropriate official(s) of the states and territories in which the two species occur.

## **Environmental Justice** \_\_\_\_\_

Executive Order 12898 requires that federal actions address environmental justice in decision-making process. In particular, the environmental effects of the actions should not have a disproportionate effect on minority and low-income communities. The preferred alternative is not expected to have a disproportionate effect on minority or low-income communities.

## CONSULTATION AND COORDINATION

NMFS consulted the following individuals, Federal, State, and local agencies, and non-NMFS persons during the development of this environmental assessment:

### **TEAM MEMBERS:**

David Bernhart	NOAA-NMFS Southeast Regional Office
Robert Hoffman	NOAA-NMFS Southeast Regional Office
Jennifer Moore	NOAA-NMFS Southeast Regional Office
Denise Johnson	NOAA-NMFS Southeast Regional Office
Sarah Heberling	NOAA-NMFS Southeast Regional Office

### **FEDERAL, STATE, AND LOCAL AGENCIES:**

Patrick Opay	NOAA-NMFS Office of Protected Resources, Permits, Conservation and Education Division
David Keys	NOAA-NMFS Southeast Regional Office
Joe Kimmel	NOAA-NMFS Southeast Regional Office Sustainable Fisheries Division
Joanne Delaney	Florida Keys National Marine Sanctuary, NOAA National Marine Sanctuaries
Lisa Lierheimer	International Affairs, U. S. Fish & Wildlife Service
Joseph Schwagerl	Navassa Wildlife Refuge, U. S. Fish & Wildlife Service
Lisa Gregg	Florida Fish & Wildlife Conservation Commission
Craig Lilystrom	Puerto Rico Department of Natural & Environmental Resources
William Coles	Division of Fish & Wildlife, Department of Planning & Natural Resources

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