also reduce, eliminate, or prevent unnecessary differences in regulatory requirements.

Similarly, the Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. For purposes of these requirements, Federal agencies may participate in the establishment of international standards, so long as the standards have a legitimate domestic objective, such as providing for safety, and do not operate to exclude imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

PHMSA participates in the establishment of international standards in order to protect the safety of the American public, and we have assessed the effects of the interim final rule to ensure that it does not cause unnecessary obstacles to foreign trade. Accordingly, this rulemaking is consistent with Executive Order 13609 and PHMSA's obligations.

List of Subjects

49 CFR Part 107

Administrative practices and procedure, Hazardous materials transportation, Packaging and containers, Penalties, Reporting and recordkeeping requirements.

49 CFR Part 171

General information, Regulations, and Definitions.

In consideration of the foregoing, 49 CFR Chapter I is amended as follows:

PART 107—HAZARDOUS MATERIALS PROGRAM PROCEDURES

■ 1. The authority citation for part 107 is revised to read as follows:

Authority: 49 U.S.C. 5101–5128, 44701; Pub. L. 101–410 section 4; Pub. L. 104–121, sections 212–213; Pub. L. 104–134, section 31001; Pub. L. 114–74 section 4 (28 U.S.C. 2461 note); 49 CFR 1.81 and 1.97.

■ 2. Revise § 107.329 to read as follows:

§ 107.329 Maximum penalties.

(a) A person who knowingly violates a requirement of the Federal hazardous material transportation law, an order issued thereunder, this subchapter, subchapter C of the chapter, or a special permit or approval issued under this subchapter applicable to the transportation of hazardous materials or the causing of them to be transported or shipped is liable for a civil penalty of not more than $77,114 for each violation, except the maximum civil penalty is $179,933 if the violation results in death, serious illness or severe injury to any person or substantial destruction of property. There is no minimum civil penalty, except for a minimum civil penalty of $463 for violations relating to training. When the violation is a continuing one, each day of the violation constitutes a separate offense.

(b) A person who knowingly violates a requirement of the Federal hazardous material transportation law, an order issued thereunder, this subchapter, subchapter C of the chapter, or a special permit or approval issued under this subchapter applicable to the design, manufacture, fabrication, inspection, marking, maintenance, reconditioning, repair or testing of a package, container, or packaging component which is represented, marked, certified, or sold by that person as qualified for use in the transportation of hazardous materials in commerce is liable for a civil penalty of not more than $77,114 for each violation, except the maximum civil penalty is $179,933 if the violation results in death, serious illness or severe injury to any person or substantial destruction of property. There is no minimum civil penalty, except for a minimum civil penalty of $463 for violations relating to training.

■ 3. In Appendix A to subpart D of part 107, Section II.B. (''Penalty Increases for Multiple Counts''), the first sentence of the second paragraph is revised to read as follows:

Appendix A to Subpart D of Part 107—Guidelines for Civil Penalties

* * * * *

Under the Federal hazmat law, 49 U.S.C. 5123(a), each violation of the HMR and each day of a continuing violation (except for violations relating to packaging manufacture or qualification) is subject to a civil penalty of up to $77,114 or $179,933 for a violation occurring on or after August 1, 2016.

* * * * *

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

■ 4. The authority citation for part 171 is revised to read as follows:

Authority: 49 U.S.C. 5101–5128, 44701; Pub. L. 101–410 section 4; Pub. L. 104–134, section 31001; Pub. L. 114–74 section 4 (28 U.S.C. 2461 note); 49 CFR 1.81 and 1.97.

■ 5. In § 171.1, paragraph (g) is revised to read as follows:

§ 171.1 Applicability of Hazardous Materials Regulations (HMR) to persons and functions.

* * * * *

(g) *Penalties for noncompliance.* Each person who knowingly violates a requirement of the Federal hazardous material transportation law, an order issued under Federal hazardous material transportation law, subchapter A of this chapter, or a special permit or approval issued under subchapter A or C of this chapter is liable for a civil penalty of not more than $77,114 for each violation, except the maximum civil penalty is $179,933 if the violation results in death, serious illness or severe injury to any person or substantial destruction of property. There is no minimum civil penalty, except for a minimum civil penalty of $463 for a violation relating to training.

Issued in Washington, DC, on June 14, 2016 under authority delegated in 49 CFR part 1.97.

Marie Therese Dominguez,

Administrator, Pipeline and Hazardous Materials Safety Administration.

[FR Doc. 2016–15404 Filed 6–28–16; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 223

[Docket No. 1206013326–6497–03]

RIN 0648–XA984

Endangered and Threatened Wildlife and Plants: Final Listing Determination on the Proposal To List the Nassau Grouper as Threatened Under the Endangered Species Act

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

ACTION: Final rule; request for information.

SUMMARY: We, NMFS, are publishing this final rule to implement our determination to list the Nassau grouper (*Epinephelus striatus*) as threatened under the Endangered Species Act of 1973, as amended (ESA). We have completed a status review of the Nassau grouper in response to a petition submitted by WildEarth Guardians. After reviewing the best scientific and commercial data available, including the status review and comments received on the proposed rule, we have determined that the Nassau grouper

meets the definition of a threatened species. While the species still occupies its historical range, overutilization through historical harvest has reduced the number of individuals which in turn has reduced the number and size of spawning aggregations. Although harvest of Nassau grouper has diminished due to management measures, the reduced number and size of spawning aggregations and the inadequacy of law enforcement continue to present extinction risk to Nassau grouper. Based on these considerations, described in more detail within this action, we conclude that the Nassau grouper is not currently in danger of extinction throughout all or a significant portion of its range, but is likely to become so within the foreseeable future. We also solicit information that may be relevant to the designation of critical habitat for Nassau grouper, including information on physical or biological features essential to the species' conservation, areas containing these features, and potential impacts of a designation.

DATES: The effective date of this final rule is July 29, 2016. Information on features, areas, and potential impacts, that may support designation of critical habitat for Nassau grouper must be received by August 29, 2016.

ADDRESSES: Information regarding this final rule may be obtained by contacting NMFS, Southeast Regional Office, 263 13th Avenue South, Saint Petersburg, FL 33701. Supporting information, including the Biological Report, is available electronically on the NMFS Web site at: *http://sero.nmfs.noaa.gov/protected_resources/listing_petitions/species_esa_consideration/index.html.*

You may submit information regarding potential critical habitat designation to the Protected Resources Division by either of the following methods:

- *Electronic Submissions:* Submit all electronic comments via the Federal eRulemaking Portal. Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2015-0130,* click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments.
- *Mail:* Submit written information to the Protected Resources Division, NMFS Southeast Regional Office, 263 13th Avenue South, Saint Petersburg, FL 33701.

FOR FURTHER INFORMATION CONTACT: Adam Brame, NMFS, Southeast Regional Office (727) 209–5958; or Lisa Manning, NMFS, Office of Protected Resources (301) 427–8466.

SUPPLEMENTARY INFORMATION:

Background

On September 3, 2010, we received a petition from the WildEarth Guardians to list speckled hind (*Epinephelus drummondhayi*), goliath grouper (*E. itajara*), and Nassau grouper (*E. striatus*) as threatened or endangered under the ESA. The petition asserted that (1) the present or threatened destruction, modification, or curtailment of habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) inadequacy of existing regulatory mechanisms; and (4) other natural or manmade factors are affecting the continued existence of and contributing to the imperiled statuses of these species. The petitioner also requested that critical habitat be designated for these species concurrent with listing under the ESA. Due to the scope of the WildEarth Guardians' petition, as well as the breadth and extent of the required evaluation and response, we provided species-specific 90-day findings (76 FR 31592, June 1, 2011; 77 FR 25687, May 1, 2012; 77 FR 61559, October 10, 2012).

On October 10, 2012, we published a 90-day finding for Nassau grouper with our determination that the petition presented substantial scientific and commercial information indicating that the petitioned action may be warranted (77 FR 61559). At that time, we announced the initiation of a formal status review and requested scientific and commercial information from the public on: (1) The status of historical and current spawning aggregation sites; (2) historical and current distribution, abundance, and population trends; (3) biological information (life history, genetics, population connectivity, etc.); (4) management measures, regulatory mechanisms designed to protect spawning aggregations, and enforcement information; (5) any current or planned activities that may adversely impact the species; and (6) ongoing or planned efforts to protect and restore the species and its habitat.

As part of the status review process to determine whether the Nassau grouper warrants listing under the ESA, we completed a Biological Report and an extinction risk analysis (ERA). The Biological Report summarizes the taxonomy, distribution, abundance, life history, and biology of the species. The Biological Report also identifies threats or stressors affecting the status of the species as well as a description of the fisheries, fisheries management, and conservation efforts. The Biological Report incorporates information received in response to our request for information (77 FR 61559, October 10, 2012) and comments from three independent peer reviewers. We used the Biological Report to complete a threats evaluation and an ERA to determine the status of the species.

After completing the Biological Report and considering the information received on the 90-day finding, we published a proposed rule to list Nassau grouper as a threatened species on September 2, 2014 (79 FR 51929). During a 90-day comment period, we solicited comments on our proposal from the public and any other interested parties.

Listing Determinations Under the ESA

We are responsible for determining whether the Nassau grouper is threatened or endangered under the ESA (16 U.S.C. 1531 *et seq.*). Section 4(b)(1)(A) of the ESA requires us to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and after taking into account efforts being made by any state or foreign nation to protect the species. To be considered for listing under the ESA, a group of organisms must constitute a ''species,'' which is defined in section 3 of the ESA to include taxonomic species and ''any subspecies of fish, or wildlife, or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.''

Section 3 of the ESA defines an endangered species as ''any species which is in danger of extinction throughout all or a significant portion of its range'' and a threatened species as one ''which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' Thus, we interpret an ''endangered species'' to be one that is presently in danger of extinction. A ''threatened species,'' on the other hand, is not currently in danger of extinction but is likely to become so in the foreseeable future. In other words, a key statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or in the foreseeable future (threatened).

Under section 4(a) of the ESA, we must determine whether any species is endangered or threatened due to any of the following five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of

existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence (sections 4(a)(1)(A) through (E)). We are required to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and after taking into account efforts being made by any state or foreign nation to protect the species.

In determining whether the Nassau grouper meets the standard of endangered or threatened, we followed a stepwise approach. First we considered the specific life history, ecology, and status of the species as documented in the Biological Report. We then considered information on factors adversely affecting and posing extinction risk to the species in a threats evaluation. In this evaluation we assessed the threats affecting the status of the species using the factors identified in ESA section 4(a)(1). We considered the nature of the threats and the species response to those threats. We also considered each threat identified, both individually and cumulatively. Once we evaluated the threats, we assessed the efforts being made to protect the species to determine if these conservation efforts were adequate to mitigate the existing threats and alter extinction risk. Finally, we considered the public comments received in response to the proposed rule. In making this finding, we have relied on the best available scientific and commercial data.

Summary of Comments Received

Below we address the comments received on the proposed listing for Nassau grouper. In response to our request for public comments, we received 17 written responses. The overall feedback was supportive of the rule with the exception of three commenters, who believe current regulations within the United States are sufficient in protecting this species. No comments addressed threats to Nassau grouper throughout the rest of their range. We did not receive any information on additional conservation efforts being taken.

Comment 1: Multiple commenters supported the proposed rule to list Nassau grouper as a threatened species and further encouraged regional collaboration to develop adequate management measures.

Response: We agree that regional collaboration will strengthen efforts to consistently manage and conserve the species, and we hope this listing will encourage collaborative efforts. In some cases, adding a species to the endangered species list leads to increased funding opportunities and potential for collaboration between state and federal partners, as well as stakeholders. We will seek regional collaborative conservation efforts within the Caribbean region to further the conservation of the species.

Comment 2: We received comments that the existing management measures implemented by Fishery Management Councils are already effective at protecting Nassau grouper within U.S. waters, (including U.S. territorial waters of Puerto Rico and the U.S. Virgin Islands) and that the listing may add unnecessary burdens on our domestic fisheries.

Response: We agree that the South Atlantic Fishery Management Council and the Caribbean Fishery Management Council have taken significant steps to protect and rebuild the Nassau grouper population in U.S. waters. Unfortunately, a large part of the species' range and population is outside of U.S. jurisdiction and is therefore not directly aided by Council protections. We must make our determination based on the best scientific and commercial data available, independent of the potential burdens to our other domestic fisheries. This standard has been applied when making the Nassau grouper final listing determination.

Comment 3: Some comments expressed concern over the economic consequences of listing Nassau grouper, including possible effects on commercial fishermen.

Response: We are unable to consider economic impacts in a listing determination. The ESA requires us to make listing determinations by evaluating the standards and factors in section 4 of the ESA, and based solely on the best scientific and commercial data available. Listing Nassau grouper as a threatened species would not create any immediate additional regulatory requirements directly affecting commercial fishermen. Potential future regulations affecting conservation of Nassau grouper, including take and import regulations may be proposed via a separate rulemaking process which would include consideration of certain economic impacts (*e.g.,* impacts on small businesses) and opportunities for public input. Individuals that require federal permits or funding for actions that might affect Nassau grouper might need to make adjustments to their activities to avoid jeopardizing Nassau grouper, and to avoid or minimize take of the species, but that would be a determination for a specific section 7 consultation in the future.

Comment 4: Several comments indicated that spawning aggregation sites need to be protected and that proper enforcement of both existing and future rules is paramount in protecting the species.

Response: We agree that the lack of adequate protections for Nassau grouper spawning aggregations and the inadequacy of law enforcement are major contributors to the species' decline throughout its range. These threats were rated 'high' during the ERA as explained in the proposed rule and, as such, were taken into consideration when making our final listing determination.

Comment 5: One commenter supported the rule stating, ''We agree that the best available science demonstrates that Nassau grouper is likely to be at risk of extinction in the foreseeable future, and may in fact be in danger of extinction now.'' They further encouraged swift designation of critical habitat to protect spawning aggregation sites, nursery and juvenile habitat, and feeding habitat.

Response: We acknowledge the concern raised by the commenter that the species may be in danger of extinction now and provide further detail below as to how we reached our listing determination in this final rule. With regard to critical habitat, section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, if prudent and determinable, critical habitat be designated concurrently with the listing of a species. We do not currently have sufficient information to determine what physical and biological features within Nassau grouper habitats facilitate the species' life history strategy and thus are essential to the species' conservation. Therefore, we cannot yet determine what areas meet the definition of critical habitat under the ESA. Because critical habitat is not currently determinable, we will not designate critical habitat concurrently with this final rule. Designation of critical habitat may occur via a subsequent rule-making process if we can identify critical habitat and designation is prudent. We are soliciting information on features, areas, and impacts of designation, that may support designation of critical habitat for Nassau grouper.

Comment 6: One commenter suggested the use of size restrictions, monitoring, closed fishing seasons for the protection of spawning aggregations, and the use of marine protected areas as measures to protect the species.

Response: We summarize in this rule the existing regulations currently in place throughout the Caribbean Sea that

include many of these suggested practices. Within U.S. waters, measures to protect Nassau grouper are already in place under the Magnuson-Stevens Act and State and Territorial fishery management authorities. As a species listed as threatened under the ESA, any federal action implemented, authorized or funded that ''may affect'' Nassau grouper will require consultation to ensure the action is not likely to jeopardize the species' continued existence. We may also implement additional protective regulations for Nassau grouper under section 4(d) of the ESA if we determine such regulations are necessary and advisable for the conservation of this threatened species. Issuance of a 4(d) rule would be a separate rule-making process that would include specific opportunities for public input.

Comment 7: The U.S. Navy identified three Navy installations or properties that are within the geographic range of Nassau grouper. They expressed concern over their ability to utilize and maintain those areas with a listing and designation of critical habitat. In particular, the Navy expressed concern over their ability to conduct maintenance dredging and requested we consult with them prior to proposing critical habitat.

Response: A rule to list Nassau grouper will require federal agencies to assess whether any actions implemented, authorized, or funded within the range of the species ''may affect'' Nassau grouper, and consult with NMFS to ensure their actions are not likely to jeopardize the species' continued existence. The rule-making process for identifying critical habitat is separate from this final listing rule and would include opportunities for public participation and input, as well as coordination with all military branches. Unlike ESA listing decisions, the designation of critical habitat requires us to consider economic, national security, and other impacts of the designation.

Comment 8: One commenter opposed the proposed rule to list Nassau grouper as a threatened species stating this is ''merely a precursor to an attempt to form a basis for a push for Marine Protection Areas.''

Response: The proposed rule to list Nassau grouper was the result of the petition we received from WildEarth Guardians, our 90-day finding that the petition presented substantial information that listing may be warranted, and our 12-month finding that listing as a threatened species was warranted. Section 4(b)(1)(A) of the ESA requires us to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and after taking into account efforts being made by any state or foreign nation to protect the species. We have not proposed any additional regulations affecting management of Nassau grouper as a result of the proposed listing rule. However, we will need to determine whether we can identify critical habitat for this species, and if so, make an appropriate designation of critical habitat. A critical habitat designation could have implications for fishing activities. Any designation of critical habitat would include opportunities for public input. As previously mentioned, we could also implement additional protective regulations for Nassau grouper under section 4(d) of the ESA, if we determine they are necessary and advisable for the conservation of this threatened species. Issuance of a 4(d) rule would be a separate rule-making process that would include specific opportunities for public input.

Changes From the Proposed Rule

In addition to responding to the comments, we made a number of changes in this final rule. These included making revisions to the Biological Review section (most notably in the Population Structure and Genetics, and the Fishing Impacts on Spawning Aggregations subsections), including a more detailed description of our role in the Threats Evaluation, providing more detail in the Extinction Risk Analysis section, and clarifying the role of foreign conservation measures as they relate to making our final listing determination. We made several of these changes to provide clarity on how we reached our listing determination in response to the comment that, ''. . . Nassau grouper is likely to be at risk of extinction in the foreseeable future, and may in fact be in danger of extinction now.''

Biological Review

This section provides a summary of key biological information presented in the Biological Report (Hill and Sadovy de Mitcheson 2013), which provides the baseline context and foundation for our listing determination.

Species Description

The Nassau grouper, *E. striatus* (Bloch 1792), is a long-lived, moderate sized serranid fish with large eyes and a robust body. Coloration is variable, but adult fish are generally buff, with five dark brown vertical bars, a large black saddle blotch on top of the base of the tail, and a row of black spots below and behind each eye. Color pattern can also change within minutes from almost white to bicolored to uniformly dark brown, according to the behavioral state of the fish (Longley 1917, Colin 1992, Heemstra and Randall 1993, Carter *et al.* 1994). A distinctive bicolor pattern is seen when two adults or an adult and large juvenile meet and is frequently observed at spawning aggregations (Heemstra and Randall 1993). There is also a distinctive dark tuning-fork mark that begins at the front of the upper jaw, extends back between the eyes, and then divides into two branches on top of the head behind the eyes. Another dark band runs from the tip of the snout through the eye and then curves upward to meet its corresponding band from the opposite side just in front of the dorsal fin. Juveniles exhibit a color pattern similar to adults (*e.g.,* Silva Lee 1977).

Maximum age has been estimated as 29 years, based on an ageing study using sagittal otoliths (Bush *et al.* 2006). Most studies indicate a rapid growth rate for juveniles, which has been estimated to be about 10 mm/month total length (TL) for small juveniles, and 8.4 to 11.7 mm/month TL for larger juveniles (Beets and Hixon 1994, Eggleston 1995). Maximum size is about 122 cm TL and maximum weight is about 25 kg (Heemstra and Randall 1993, Humann and Deloach 2002, Froese and Pauly 2010). Generation time (the interval between the birth of an individual and the subsequent birth of its first offspring) is estimated as 9–10 years (Sadovy and Eklund 1999).

Distribution

The Nassau grouper's confirmed distribution currently includes ''Bermuda and Florida (USA), throughout the Bahamas and Caribbean Sea'' (*e.g.,* Heemstra and Randall 1993). The occurrence of Nassau grouper from the Brazilian coast south of the equator as reported in Heemstra and Randall (1993) is ''unsubstantiated'' (Craig *et al.* 2011). The Nassau grouper has been documented in the Gulf of Mexico, at Arrecife Alacranes (north of Progreso) to the west off the Yucatan Peninsula, Mexico, (Hildebrand *et al.* 1964). Nassau grouper is generally replaced ecologically in the eastern Gulf by red grouper (*E. morio*) in areas north of Key West or the Tortugas (Smith 1971). They are considered a rare or transient species off Texas in the northwestern Gulf of Mexico (Gunter and Knapp 1951 in Hoese and Moore 1998). The first confirmed sighting of Nassau grouper in the Flower Garden Banks National Marine Sanctuary, which is located in the northwest Gulf of Mexico

approximately 180 km southeast of Galveston, Texas, was reported by Foley *et al.* (2007). Many earlier reports of Nassau grouper up the Atlantic coast to North Carolina have not been confirmed. The Biological Report (Hill and Sadovy de Mitcheson, 2013) provides a detailed description of their distribution.

Habitat and Depth

The Nassau grouper is primarily a shallow-water, insular fish species that has long been valued as a major fishery resource throughout the wider Caribbean, South Florida, Bermuda, and the Bahamas (Carter *et al.* 1994). The Nassau grouper is considered a reef fish, but it transitions through a series of developmental shifts in habitat. As larvae, they are planktonic. After an average of 35–40 days and at an average size of 32 mm TL, larvae recruit from an oceanic environment into demersal habitats (Colin 1992, Eggleston 1995). Following settlement, juvenile Nassau grouper inhabit macroalgae (primarily *Laurencia* spp.), coral clumps (*Porites* spp.), and seagrass beds (Eggleston 1995, Dahlgren 1998). Recently-settled Nassau grouper have also been collected from rubble mounds, some from tilefish (*Malacanthus plumieri*), at 18 m depth (Colin *et al.* 1997). Post-settlement, small Nassau grouper have been reported with discarded queen conch shells (*Strombus gigas*) and other debris around *Thalassia* beds (Randall 1983, Eggleston 1995).

Juvenile Nassau grouper (12–15 cm TL) are relatively solitary and remain in specific areas for months (Bardach 1958). Juveniles of this size class are associated with macroalgae, and both natural and artificial reef structure. As juveniles grow, they move progressively to deeper areas and offshore reefs (Tucker *et al.* 1993, Colin *et al.* 1997). Schools of 30–40 juveniles (25–35 cm TL) were observed at 8–10 m depths in the Cayman Islands (Tucker *et al.* 1993). No clear distinction can be made between types of adult and juvenile habitats, although a general size segregation with depth occurs—with smaller Nassau grouper in shallower inshore waters (3.7–16.5 m) and larger individuals more common on deeper (18.3–54.9 m) offshore banks (Bardach *et al.* 1958, Cervigón 1966, Silva Lee 1974, Radakov *et al.* 1975, Thompson and Munro 1978).

Recent work by Nemeth and coworkers in the U. S. Virgin Islands (U.S.V.I.; manuscript, in prep) found more overlap in home ranges of smaller juveniles compared to larger juveniles and adults have larger home ranges with less overlap. Mean home range of adult Nassau grouper in the Bahamas was 18,305 $m^2 \pm 5{,}806$ (SD) with larger ranges at less structurally-complex reefs (Bolden 2001). The availability of habitat and prey was found to significantly influence home range of adults (Bolden 2001).

Adult Nassau grouper tend to be relatively sedentary and are generally associated with high-relief coral reefs or rocky substrate in clear waters to depths of 130 m. Generally, adults are most common at depths less than 100 m (Hill and Sadovy de Mitcheson, 2013) except when at spawning aggregations where they are known to descend to depths of 255 m (Starr *et al.* 2007).

Diet and Feeding

Adult Nassau grouper are unspecialized, bottom-dwelling, ambush-suction predators (Randall 1965, Thompson and Munro 1978). Numerous studies describe adult Nassau grouper as piscivorous (Randall and Brock 1960, Randall 1965, Randall 1967, Carter *et al.* 1994, Eggleston *et al.* 1998). Feeding can take place around the clock although most fresh food is found in stomachs collected in the early morning and at dusk (Randall 1967). Young Nassau grouper (20.2–27.2 mm standard length; SL) feed on a variety of plankton, including pteropods, amphipods, and copepods (Greenwood 1991, Grover *et al.* 1998).

Population Structure and Genetics

Early genetic analyses indicated high gene flow throughout the geographic range of Nassau grouper but were unable to determine the relative contributions of populations (Hinegardner and Rosen 1972, Hateley 2005). A study of Nassau grouper genetic population structure, using mitochondrial DNA (mtDNA) and nuclear microsatellite DNA, revealed no clearly defined population substructuring based on samples from Belize, Cuba, Bahamas, and Florida. These data indicated that spawning aggregations are not exclusively self-recruiting and that larvae can disperse over great distances, but the relative importance of self-recruitment and larval immigration to local populations was unclear (Sedberry *et al.* 1996). Similarly, a study by Hateley (2005) that analyzed samples from Belize, Bahamas, Turks and Caicos, and Cayman Islands using enzyme electrophoresis indicated low to intermediate levels of genetic variability. Results from this study provided no evidence for population substructuring by sex or small-scale spatial distribution, or for macrogeographic stock separation. These results are consistent with a single panmictic population within the northern Caribbean basin with high gene flow through the region.

A recent study, published subsequent to the Biological Report, analyzed genetic variation in mtDNA, microsatellites, and single nucleotide polymorphisms for Nassau grouper (Jackson *et al.* 2014). The study identified three potential ''permeable'' barriers to dispersal and concluded that large-scale oceanographic patterns likely influence larval dispersal and population structuring (regional genetic differentiation). However, the evidence of population structuring was limited. In pairwise analyses of genetic distance between the sample populations (using Fst for microsatellites and Φst for mtDNA), zero (of 171) comparisons based on microsatellite DNA were statistically signficant, only 47 (of 153) comparisons based on mtDNA were statistically significant ($p < 0.00029$), and there was no indication of isolation by distance in any of the genetic datasets. Overall, while this study indicated some instances of genetic differentiation, the results do not indicate a high degree of population structuring across the range. When the Jackson *et al.* study is considered in the context of the larger body of literature, there remains some uncertainty as to population substructuring for Nassau grouper.

Reproductive Biology

The Nassau grouper was originally considered to be a monandric protogynous hermaphrodite, meaning males derive from adult females that undergo a change in sex (Smith 1971, Claro *et al.* 1990, Carter *et al.* 1994). While it is taxonomically similar to other hermaphroditic groupers, the Nassau grouper is now primarily considered a gonochore with separate sexes (Sadovy and Colin 1995). Juveniles were found to possess both male and female tissue, indicating they can mature directly into either sex (Sadovy and Colin 1995). Other characteristics such as the strong size overlap between males and females, the presence of males that develop directly from the juvenile phase, the reproductive behavior of forming spawning aggregations, and the mating system were found to be inconsistent with the protogynous reproductive strategy (Colin 1992, Sadovy and Colin 1995).

Both male and female Nassau grouper typically mature at 4–5 years of age and at lengths between 40 and 45 cm SL (44 and 50 cm TL). Size, rather than age, may be the major determinant of sexual maturation (Sadovy and Eklund 1999).

Nassau grouper raised from eggs in captivity matured at 40–45 cm SL (44–50 cm TL) in just over 2 years (Tucker and Woodward 1994). Yet, the minimum age at sexual maturity based on otoliths is between 4 and 8 years (Bush *et al.* 1996, 2006). Most fish have spawned by age 7+ years (Bush *et al.* 2006).

Fecundity estimates vary by location throughout the Caribbean. Mean fecundity estimates are generally between 3 and 5 eggs/mg of ripe ovary. For example, Carter *et al.* (1994) found female Nassau grouper between 30–70 cm SL from Belize yielded a mean relative fecundity of 4.1 eggs/mg ovary weight and a mean total number of 4,200,000 oocytes (range = 350,000 − 6,500,000). Estimated number of eggs in the ripe ovary (90.7 g) of a 44.5 cm SL Nassau grouper from Bermuda was 785,101 (Bardach *et al.* 1958). In the U.S.V.I., mean fecundity was 4.97 eggs/mg of ovary (s.d. = 2.32) with mean egg production of 4,800,000 eggs (Olsen and LaPlace 1979); however, this may be an overestimate as it included premature eggs that may not develop. Fecundity estimates based only on vitellogenic oocytes, from fish captured in the Bahamas indicated a mean relative fecundity of 2.9 eggs/mg ripe ovary (s.d. = 1.09; n = 64) and a mean egg production of 716,664 (range = 11,724 − 4,327,440 for females between 47.5–68.6 cm SL). Estimates of oocyte production from Nassau grouper induced to spawn in captivity are closer to the lower estimates based solely on vitellogenic oocyte counts.

Spawning Behavior and Habitat

Nassau grouper form spawning aggregations at predictable locations around the winter full moons, or between full and new moons (Smith 1971, Colin 1992, Tucker *et al.* 1993, Aguilar-Perera 1994, Carter *et al.* 1994, Tucker and Woodward 1994). Aggregations consist of hundreds, thousands, or, historically, tens of thousands of individuals. Some aggregations have persisted at known locations for periods of 90 years or more (see references in Hill and Sadovy de Mitcheson 2013). Pair spawning has not been observed.

About 50 individual spawning aggregation sites have been recorded, mostly from insular areas in the Bahamas, Belize, Bermuda, British Virgin Islands, Cayman Islands, Cuba, Honduras, Jamaica, Mexico, Puerto Rico, Turks and Caicos, and the U.S.V.I.; however, many of these may no longer form (Figure 10 in Hill and Sadovy de Mitcheson 2013). Recent evidence suggests that spawning is occurring at what may be reconstituted or novel spawning sites in both Puerto Rico and the U.S.V.I. (Hill and Sadovy de Mitcheson 2013). Suspected or anecdotal evidence also identifies spawning aggregations in Los Roques, Venezuela (Boomhower *et al.* 2010) and Old Providence in Colombia's San Andrés Archipelago (Prada *et al.* 2004). Neither aggregation nor spawning has been reported from South America, despite the fact ripe Nassau grouper are frequently caught in certain areas (F. Cervigón, Fundacion Cientifica Los Roques-Venezuela, pers. comm. to Y. Sadovy, NMFS, 1991). Spawning aggregation sites have not been reported in the Lesser Antilles, Central America south of Honduras, or Florida.

''Spawning runs,'' or movements of adult Nassau grouper from coral reefs to spawning aggregation sites, were first described in Cuba in 1884 by Vilaro Diaz, and later by Guitart-Manday and Juarez-Fernandez (1966). Nassau grouper migrate to aggregation sites in groups numbering between 25 and 500, moving parallel to the coast or along shelf edges or even inshore reefs (Colin 1992, Carter *et al.* 1994, Aguilar-Perera and Aguilar-Davila 1996, Nemeth *et al.* 2009). Distance traveled by Nassau grouper to aggregation sites is highly variable; some fish move only a few kilometers (km), while others move up to several hundred km (Colin 1992, Carter *et al.* 1994, Bolden 2000). Ongoing research in the Exuma Sound, Bahamas has tracked migrating Nassau grouper up to 200 km, with likely estimates of up to 330 km, as they move to aggregation sites (Hill and Sadovy de Mitcheson 2013).

Observations suggest that individuals can return to their original home reef following spawning. Bolden (2001) reported 2 out of 22 tagged fish returning to home reefs in the Bahamas one year after spawning. Sonic tracking studies around Little Cayman Island have demonstrated that spawners may return to the aggregation site in successive months with returns to their residential reefs in between (Semmens *et al.* 2007). Sixty percent of fish tagged at the west end spawning aggregation site in Little Cayman in January 2005 returned to the same aggregation site in February 2005 (Semmens *et al.* 2007). Larger fish are more likely to return to aggregation sites and spawn in successive months than smaller fish (Semmens *et al.* 2007).

It is not known how Nassau grouper select and locate aggregation sites or why they aggregate to spawn. Spawning aggregation sites are typically located near significant geomorphological features, such as projections (promontories) of the reef as little as 50 m from the shore, and close to a drop-off into deep water over a wide (6–60 m) depth range (Craig 1966, Smith 1972, Burnett-Herkes 1975, Olsen and LaPlace 1979, Colin *et al.* 1987, Carter 1989, Fine 1990, Beets and Friedlander 1998, Colin 1992, Aguilar-Perera 1994). Sites are characteristically small, highly circumscribed areas, measuring several hundred meters in diameter, with soft corals, sponges, stony coral outcrops, and sandy depressions (Craig 1966, Smith 1972, Burnett-Herkes 1975, Olsen and LaPlace 1979, Colin *et al.* 1987, Carter 1989, Fine 1990, Beets and Friedlander 1999, Colin 1992, Aguilar-Perera 1994). Recent work has identified geomorphological similarities in spawning sites that may be useful in applying remote sensing techniques to discover previously unknown spawning sites (Kobara and Heyman 2010).

The link between spawning sites and settlement sites is also not well understood. Researchers speculate the location of spawning sites assists offshore transport of fertilized eggs. However, currents nearby aggregation sites do not necessarily favor offshore egg transport, indicating some locations may be at least partially self-recruiting (*e.g.,* Colin 1992). In a study around a spawning aggregation site at Little Cayman, surface velocity profile drifters released on the night of peak spawning tended to remain near or returned to the spawning reef due to eddy formation, while drifters released on the days preceding the peak spawn tended to move away from the reef in line with the dominant currents (Heppell *et al.* 2011).

Spawning aggregations form around the full moon between December and March (reviewed in Sadovy and Eklund 1999), though this may occur later (May–August) in more northerly latitudes (La Gorce 1939, Bardach *et al.* 1958, Smith 1971, Burnett-Herkes 1975). The formation of spawning aggregations is triggered by a very narrow range of water temperatures between 25°–26 °C. While day length has also been considered as a trigger for aggregation formation (Colin 1992, Tucker *et al.* 1993, Carter *et al.* 1994), temperature is evidently a more important stimulus (Hill and Sadovy de Mitcheson 2013). The narrow range of water temperature is likely responsible for the later reproductive season in more northerly latitudes like Bermuda.

Spawning occurs for up to 1.5 hours around sunset for several days (Whaylen *et al.* 2007). At spawning aggregation sites, Nassau grouper tend to mill around for a day or two in a ''staging area'' adjacent to the core area where

spawning activity later occurs (Colin 1992, Kadison *et al.* 2010, Nemeth 2012). Courtship is indicated by two behaviors that occur late in the afternoon: ''following'' and ''circling'' (Colin 1992). The aggregation then moves into deeper water shortly before spawning (Colin 1992, Tucker *et al.* 1993, Carter *et al.* 1994). Progression from courtship to spawning may depend on aggregation size, but generally fish move up into the water column, with an increasing number exhibiting the bicolor phase (Colin 1992, Carter *et al.* 1994).

Spawning involves a rapid horizontal swim or a ''rush'' of bicolor fish following dark fish closely in either a column or cone rising to within 20–25 m of the water surface where group-spawning occurs in sub-groups of 3–25 fish (Olsen and LaPlace 1979, Carter 1986, Aguilar-Perera and Aguilar-Davila 1996). Following the release of sperm and eggs, there is a rapid return of the fragmented sub-group to the bottom. All spawning events have been recorded within 20 minutes of sunset, with most within 10 minutes of sunset (Colin 1992).

Repeated spawning occurs at the same site for up to three consecutive months generally around the full moon or between the full and new moons (Smith 1971, Colin 1992, Tucker *et al.* 1993, Aguilar-Perera 1994, Carter *et al.* 1994, Tucker and Woodward 1994). Participation by individual fish across the months is unknown. Examination of female reproductive tissue suggests multiple spawning events across several days at a single aggregation (Smith 1972, Sadovy, NMFS, pers. obs.). A video recording shows a single female in repeated spawning rushes during a single night, repeatedly releasing eggs (Colin 1992). It is unknown whether a single, mature female will spawn continuously throughout the spawning season or just once per year.

Status Assessments

Few formal stock assessments have been conducted for the Nassau grouper. The most recent published assessment, conducted in the Bahamas, indicates fishing effort, and hence fishing mortality (F), in the Bahamas needs to be reduced from the 1998–2001 levels, otherwise the stocks are likely to be overexploited relative to biological reference points (Cheung *et al.* 2013). The population dynamic modeling by Cheung *et al.* (2013) found: ''assuming that the closure of the spawning aggregation season is perfectly implemented and enforced, the median value of F_{SPR} (the fishing mortality rate that produces a certain spawning potential ratio) = 35 percent on non-spawning fish would be 50 percent of the fishing mortality of the 1998 to 2001 level. The 5 percent and 95 percent confidence limits are estimated to be less than 20 percent and more than 100 percent of the fishing mortality at the 1998 to 2001 level, respectively. In other words, if (1) fishing mortality (F) rates of non-spawning fish are maintained at the 1998 to 2001 level, and (2) fishing on spawning aggregations is negligible, the median spawning potential (spawner biomass relative to the unexploited level) is expected to be around 25 percent (5 and 95 percent confidence interval (CI) of 20 and 30 percent, respectively). This level is significantly below the reference limit of 35 percent of spawning potential, meaning that there is a high chance of recruitment overfishing because of the low spawning stock biomass.''

The Nassau grouper was formerly one of the most common and important commercial groupers in the insular tropical western Atlantic and Caribbean (Smith 1978, Randall 1983, Appeldoorn *et al.* 1987, Sadovy 1997). Declines in landings and catch per unit of effort (CPUE) have been reported throughout its range, and it is now considered to be commercially extinct (*i.e.,* the species is extinct for fishery purposes due to low catch per unit effort) in a number of areas, including Jamaica, Dominican Republic, U.S.V.I., and Puerto Rico (Sadovy and Eklund 1999). Information on past and present abundance and density, at coral reefs and aggregation sites, is based on a combination of anecdotal accounts, visual census surveys, and fisheries data. Because grouper species are reported collectively in landings data, there are limited species-specific data to determine catch of Nassau grouper throughout its range.

While fisheries dependent data are generally limited for the species throughout its range, there are some 1970s and 1980s port-sampling data from the U.S.V.I. and Puerto Rico. In the U.S.V.I., Nassau grouper accounted for 22 percent of total grouper landings, and 85 percent of the Nassau grouper catch came from spawning aggregations (D. Olsen, Chief Scientist—St. Thomas Fishermen's Association, pers. comm. to J. Rueter, NMFS, October 2013). The first U.S. survey of the fishery resources of Puerto Rico noted the Nassau grouper was common and a very important food fish, reaching a weight of 22.7 kg or more (Evermann 1900). The Nassau grouper was still the fourth-most common shallow-water species landed in Puerto Rico in the 1970s (Thompson 1978), and it was common in the reef fish fishery of the U.S.V.I. (Olsen and LaPlace 1979). By 1981, ''the Nassau grouper ha[d] practically disappeared from the local catches and the ones that d[id] appear [were] small compared with previous years'' (CFMC 1985). By 1986, the Nassau grouper was considered commercially extinct in the U.S. Caribbean (Bohnsack *et al.* 1986). About 1,000 kg of Nassau grouper landings were reported in the Puerto Rico Reef Fish Fishery during the latter half of the 1980s, and most of them were less than 50 cm indicating they were likely sexually immature (Sadovy 1997).

A number of organizations and agencies have conducted surveys to examine the status of coral reefs and reef-fish populations throughout the western Atlantic. Results from these monitoring studies offer some indication of relative abundance of Nassau grouper in various locations, although different methods are often employed and thus results of different studies cannot be directly compared (Kellison *et al.* 2009). The Atlantic and Gulf Rapid Reef Assessment Program (AGRRA), which samples a broad spectrum of western Atlantic reefs, includes few reports of Nassau grouper, as sighting frequency (proportion of all surveys with at least one Nassau grouper present) ranged from less than 1 percent to less than 10 percent per survey from 1997–2000. Density of Nassau grouper ranged from 1 to 15 fish/hectare with a mean of 5.6 fish/hectare across all areas surveyed (AGRRA). NOAA's Coral Reef Ecosystem Monitoring Program (CREMP) has conducted studies on coral reefs in Puerto Rico and the U.S.V.I. since 2000, and sighting frequency of Nassau grouper has ranged from 0 to 0.5 percent with density between 0 to 0.5 fish/hectare. Data from SCUBA surveys conducted by the University of the Virgin Islands report a density of 4 Nassau grouper/hectare per survey across reef habitat types in the U.S.V.I. SCUBA surveys by NOAA in the Florida Keys across reef habitat types have sighting frequencies of 2–10 percent per survey, with a density of 1 Nassau grouper/hectare (NOAA's NMFS FRVC). In addition to these surveys, Hodgson and Liebeler (2002) noted that Nassau grouper were absent from 82 percent of shallow Caribbean reefs surveyed (3–10 m) during a 5-year period (1997–2001) for the ReefCheck project.

Fishing Impacts on Spawning Aggregations

Because we lack sufficient stock assessments or population estimates, we considered the changes in spawning aggregations as a proxy for the status of the current population. We believe the

status of spawning aggregations is likely to be reflective of the overall population because adults migrate to spawning aggregations for the only known reproductive events. Historically, 50 spawning aggregation sites had been identified throughout the Caribbean (Sadovy de Mitcheson *et al.* 2008). Of these 50, less than 20 probably still remain (Sadovy de Mitcheson *et al.* 2008). Furthermore, while numbers of fish at aggregation sites once numbered in the tens of thousands (30,000–100,000 fish; Smith 1972), they have now been reduced to less than 3,000 at those sites where counts have been made (Sadovy de Mitcheson *et al.* 2008). Based on the size and number of current spawning aggregations the Nassau grouper population appears to be just a fraction of its historical size.

In general, slow-growing, long-lived species (such as snappers and groupers) with limited spawning periods, and possibly with narrow recruitment windows, are susceptible to overexploitation (Bannerot *et al.* 1987, Polovina and Ralston 1987). The strong appeal of spawning aggregations as targets for fishing, their importance in many seasonal fisheries, and the apparent abundance of fish at aggregations make spawning aggregations particularly susceptible to over-exploitation. There are repeated reports from across the Caribbean where Nassau grouper spawning aggregations have been discovered and fished to the point that the aggregation ceased to form, or formed at such low densities that spawning was no longer viable. For example, the commercial fishing of Nassau grouper aggregations in Bermuda resulted in decreased landings from 75,000 tons in 1975 to 10,000 tons by 1981 (Luckhurst 1996, Sadovy de Mitcheson and Erisman 2012). The four known spawning aggregation sites in Bermuda ceased to form shortly thereafter and have yet to recover (Sadovy de Mitcheson and Erisman 2012). However, Nassau grouper are still present in Bermuda and reported observations have slightly increased over the last 10–15 years (B. Luckhurst, Bermuda Department of Agriculture, Fisheries, and Parks, Division of Fisheries, pers. comm. to Y. Sadovy, University of Hong Kong, 2012). In Puerto Rico, historical spawning aggregations no longer form, though a small aggregation has recently been found, and may be a reconstitution of one of the former aggregations (Schärer et al. 2012). In Mahahual, Quintana Roo, Mexico, aggregations of up to 15,000 fish formed each year, but due to increased fishing pressure in the 1990's, aggregations have not formed in Mahahual since 1996 (Aguilar-Perera 2006). Inadequate enforcement of management measures designed to protect spawning aggregations in Mexico has further affected aggregations (Aguilar-Perera 2006), though at least three aggregation sites remain viable. In Cuba, Nassau grouper were almost exclusively targeted during aggregation formation; because of this, there have been severe declines in the number of Nassau grouper at 8 of the 10 aggregations and moderate declines in the other 2 (Claro *et al.* 2009). Similar situations are known to have occurred in the Bahamas, U.S.V.I., Puerto Rico, and Honduras (Sadovy de Mitcheson and Erisman 2012, see also Hill and Sadovy de Mitcheson 2013).

Overexploitation has also occurred in Belize. Between 1975 and 2001 there was an 80 percent decline in the number of Nassau grouper (15,000 fish to 3,000) at the Glover's Reef aggregation (Sala *et al.* 2001). Additionally, a 2001 assessment concluded that only 2 of the 9 aggregation sites identified in 1994 remained viable, and those had been reduced from 30,000 fish to 3,000–5,000 fish (Heyman 2002). More recent monitoring (2003–2012) at the two sites at Glover's Reef indicates further declines in the sizes of these aggregations. A maximum of 800–3,000 Nassau grouper were counted per year at these sites over the ten years of monitoring (Belize SPAG Working Group 2012).

Further indicators of population decline through over-exploitation include reduced size and/or age of fish harvested compared to maximum sizes and ages. Nassau grouper can attain sizes of greater than 120 cm (Heemstra and Randall 1993, Humann and Deloach 2002, Froese and Pauly 2010) and live as long as 29 years (Bush *et al.* 2006). However, it is unusual to obtain individuals of more than 12 years of age in exploited fisheries, and more heavily fished areas yield much younger fish on average. The maximum age estimates in heavily exploited areas are depressed—9 years in the U.S.V.I. (Olsen and LaPlace 1979), 12 years in northern Cuba, 17 years in southern Cuba (Claro *et al.* 1990), and 21 years in the Bahamas (Sadovy and Colin 1995). Similarly, there is some indication that size at capture of both sexes declined in areas of higher exploitation versus unexploited populations within a specific region (Carter et al 1994). When exploitation is high, catches are largely comprised of juveniles. For example, most catches of Nassau grouper in heavily exploited areas of Puerto Rico, Florida (Sadovy and Eklund 1999), and Cuba (Espinosa 1980) consisted of juveniles. In exploited U.S.V.I. aggregations, harvest of Nassau grouper larger than 70 cm TL was uncommon (Olsen and LaPlace 1979).

While direct fishing of spawning aggregations was a primary driver of Nassau grouper population declines as indicated by the observed declines in spawning aggregations (Sadovy de Mitcheson and Erisman 2012), other factors also affect abundance. For example, removal of adults from spawning runs and intensive capture of juveniles, either through direct targeting (*e.g.,* spearfishing) or using small mesh traps or nets, also occur (Hill and Sadovy de Mitcheson 2013). In addition to the high fishing pressure in some areas, poaching also appears to be affecting some populations (*e.g.,* in the Cayman Islands; Semmens *et al.* 2012).

NMFS's Conclusions From the Biological Report

The species is made up of a single population over its entire geographic range. As summarized above, multiple genetic analyses indicate that there is high gene flow throughout the geographic range of the Nassau grouper, and no clearly defined population substructuring has been identified (Hinegardner and Rosen 1972, Sedberry *et al.* 1996, Hateley 2005). Although a recent study (Jackson *et al.* 2014) reported genetic differentiation, it does not provide evidence to support biological differences between populations. We believe further studies are needed to verify and expand upon the work presented by Jackson *et al* (2014). Based on the best available information, we conclude there is a single population of Nassau grouper throughout the Caribbean.

The species has patchy abundance, with declines identified in many areas. The Biological Report describes the reduction in both size and number of spawning aggregations throughout the range. Patchy abundance throughout the range of a species is common due to differences in habitat quality/quantity or exploitation levels at different locations. However, dramatic, consistent declines of Nassau grouper have been noted throughout its range. In many areas throughout the Caribbean, the species is now considered commercially extinct and numerous spawning aggregations have been extirpated with no signs of recovery.

The species possesses life history characteristics that increase vulnerability to harvest, including slow growth to a large size, late maturation, formation of large spawning aggregations, and occurrence in shallow

habitat. This conclusion is based on the Description of the Species in the Biological Report (Hill and Sadovy de Mitcheson 2013). Slow growth and late maturation expose sub-adults to harvest prior to reproduction. Sub-adult and adult Nassau grouper form large conspicuous spawning aggregations. These aggregations are often in shallow habitat areas that are easily accessible to fishermen and thus heavily exploited. Despite these life-history vulnerabilities, there are remaining spawning aggregations that, while reduced in size and number, still function and provide recruits into the population.

The species is broadly distributed, and its current range is similar to its historical range. The Range-wide Distribution section of the Biological Report (Hill and Sadovy de Mitcheson 2013) concluded that the current range is equivalent to the historical range, though abundance has been severely depleted.

Threats Evaluation

The threats evaluation was the second step in the process of making an ESA listing determination for Nassau grouper as described above in ''Listing Determinations under the ESA''. The Extinction Risk Analysis Group (ERAG), which consisted of 12 NOAA Fisheries Science Center and Regional Office personnel, was asked to independently review the Biological Report and assess 4 demographic factors (abundance, growth rate/productivity, spatial structure/connectivity, and diversity) and 13 specific threats (see ERA Threat Table under supporting documents). The group members were asked to provide qualitative scores based on their perceived severity of each factor and threat.

Members of the ERAG were asked to independently evaluate the severity, scope, and certainty for these threats currently and in the foreseeable future (30 years from now). The foreseeable future was based on the upper estimate of generation time for Nassau grouper (9–10 years) as described by Sadovy and Eklund (1999) and an age at maturity of 8 years (Bush *et al.* 1996, 2006). We chose 30 years, which would potentially allow recruitment of 2–3 generations of mature individuals to appear in spawning aggregations as a result of fishery management actions. Given the limited information we have to predict the impacts of threats, we felt the 30 year timeframe was the most appropriate to assess threats in the foreseeable future.

Members of the ERAG were asked to rank each of four demographic factors and 13 identified threats as ''very low risk,'' ''low risk,'' ''moderate risk,'' ''increasing risk,'' ''high risk,'' or ''unknown.'' ''Very low risk'' meant that it is unlikely that the demographic factor or threat affects the species' overall status. ''Low risk'' meant that the demographic factor may affect species' status, but only to a degree that it is unlikely that this factor significantly elevates risk of extinction now or in the future. ''Moderate risk'' meant that the demographic factor or threat contributes significantly to long term risk of extinction, but does not constitute a danger of extinction in the near future. ''Increasing risk'' meant that the present demographic risk or threat is low or moderate, but is likely to increase to high risk in the foreseeable future if present conditions continue. Finally, ''high risk'' meant that the demographic factor or threat indicates danger of extinction in the near future. Each member of the ERAG evaluated risk on this scale, and we then interpreted these rankings against the statutory language for threatened or endangered to determine the status of Nassau grouper. We did not directly relate the risk levels with particular listing outcomes, because the risk levels alone are not very informative. Acknowledging the differences in terminology between the ERAG risk scale and the ESA statutory definitions of threatened and endangered, we relied upon our own judgment and expertise in reviewing the ERA to determine the status of Nassau grouper and form our final listing determination.

ERAG members were also asked to consider the potential interactions between demographic factors and threats. If the demographic factor or threat was ranked higher due to interactions with other demographic factors or threats, each member was asked to then identify those factors or threats that caused them to score the risk higher or lower than it would have been if it were considered independently. We then examined the independent responses from each ERAG member for each demographic factor and threat and used the modal response to determine the level of threat to Nassau grouper.

Climate change and international trade regulations (*e.g.,* the Convention on International Trade in Endangered Species (CITES), as described in the Biological Report) were categorized by the ERAG as ''unknown.'' Habitat alteration, U.S. federal regulations, disease/parasites/abnormalities, and aquaculture were ranked as ''very low risk'' to ''low risk.'' State/territorial regulations, growth rate/productivity, abundance, spatial structure/connectivity, commercial harvest, foreign regulations, artificial selection, and diversity were ranked as ''moderate risk'' to ''increasing risk.'' Historical harvest (the effect of prior harvest on current population status), fishing at spawning aggregations, and inadequate law enforcement were classified as ''high risk.'' The demographic factors and threats are described below by the five ESA factors with the corresponding ERAG ranking and our analysis.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Spatial structure/connectivity and habitat alteration were considered under ESA Factor A; this included habitat loss or degradation, and the loss of habitat patches, critical source populations, subpopulations, or dispersal among populations.

Nassau grouper use many different habitat types within the coral reef ecosystem. The increase in urban, industrial, and tourist developments throughout the species range impacts coastal mangroves, seagrass beds, estuaries, and live coral (Mahon 1990). Loss of juvenile habitat, such as macroalgae, seagrass beds, and mangrove channels is likely to negatively affect recruitment rates. Habitat alteration was ranked by the ERAG as a ''low risk'' threat to Nassau grouper. We agree with the ERAG that habitat alteration presents a low risk to the species and is unlikely to contribute to the threat of extinction presently or over the foreseeable future. The use of many different habitat types by Nassau grouper may spread the risk of impacts associated with habitat loss to a point that reduces overall extinction risk to the species.

The range of Nassau grouper is influenced by spatial structure and connectivity of the population. As described in Hill and Sadovy de Mitcheson (2013), a study of genetic population structure in Nassau grouper revealed no clearly defined population substructuring at the geographic locations sampled, *i.e.,* Belize, Cuba, Bahamas, and Florida (Sedberry *et al.* 1996). Based on ERAG scores, spatial structure/connectivity was characterized as an ''increasing'' risk for Nassau grouper. We agree with the ERAG ranking and believe this increasing risk is due, in part, to the declining number and size of spawning aggregations, which affects population structure. Given the increasing risk associated with this demographic factor we believe it could lead the species to become endangered over the foreseeable future.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Based on ERAG rankings, historical harvest and fishing at spawning aggregations are two of the three most severe threats (the third being inadequate law enforcement) to Nassau grouper. Historical harvest and fishing at spawning aggregations were both classified as ''high'' risk threats to Nassau grouper. Curiously, the ERAG rankings for commercial harvest, which often includes the fishing on spawning aggregations, were lower and indicated current commercial harvest was a ''moderate'' threat for Nassau grouper. We believe this lower ranking may be related to the fact that the species has declined to the point that commercial harvest is not as large a threat as in decades past. This is also related to abundance which was similarly classified as a ''moderate'' risk for Nassau grouper.

Two different aspects of fishing affect Nassau grouper abundance: Fishing effort throughout the non-spawning months and directed fishing at spawning aggregations or on migrating adults. In some countries Nassau grouper are fished commercially and recreationally throughout the year by handline, longline, fish traps, spear guns, and gillnets (NMFS General Canvas Landing System). Fishing at spawning aggregations is mainly conducted by handlines or by fish traps, although gillnets were being used in Mexico in the early to mid-1990s (Aguilar-Perera 2004). Declines in landings, catch per unit effort (CPUE) and, by implication, abundance in the late 1980s and early 1990s occurred throughout its range, which has led Nassau grouper to now be considered commercially extinct in a number of areas (Sadovy and Eklund 1999). Population declines and loss of spawning aggregations continue throughout the Nassau grouper's range (Sadovy de Mitcheson 2012).

We agree with the ERAG's assessment for the threat of abundance. It is clear that the abundance of Nassau grouper has diminished dramatically over the past several decades. This decline is a direct impact of historical harvest and the overfishing of spawning aggregations. The current abundance of Nassau grouper is not causing or contributing to the species currently being in danger of extinction but does raise concern for the status of the species over the foreseeable future if abundance continues to decline.

We disagree with the ERAG's ''high risk'' rating for historical harvest. We believe that while historical harvest has reduced the population size of Nassau grouper, which has in turn affected the ability of the population to recover, we don't agree that this threat continues to be a ''high risk''. It seems more appropriate to consider the ERAG's risk assessment for the abundance of the current population in making our listing determination.

Predictable spawning aggregations make Nassau grouper a vulnerable fishing target. In many places, annual landings for Nassau grouper were mostly from aggregation-fishing (*e.g.,* Claro *et al.* 1990, Bush *et al.* 2006). Because Nassau grouper are only known to reproduce in spawning aggregations, removing ripe individuals from the spawning aggregations greatly influences population dynamics and future fishery yields (Shapiro 1987). Harvesting a species during its reproductive period increases adult mortality and diminishes juvenile recruitment rates. The loss of adults and the lack of recruitment greatly increase a species' extinction risk. The collapse of aggregations in many countries (Sadovy de Mitcheson 2012) was likely a result of overharvesting fish from spawning aggregations (Olsen and LaPlace 1979, Aguilar-Perera 1994, Sadovy and Eklund 1999). As Semmens *et al.* (2012) noted from the results of a mark-recapture study on Cayman Brac, Cayman Island fishermen appear to catch sufficient adult grouper outside the spawning season to seriously impact population size. It appears that fishing at spawning aggregations has depressed population size such that fishing operations away from the aggregations are also impacting population status.

We agree that fishing at spawning aggregations has reduced the population of Nassau grouper and has affected its current status. While the ERAG determined this is a ''high risk'' threat, we are less certain about our determination. We believe that this threat is in large part exacerbated by the inadequacy of regulatory mechanisms as discussed further below under Factor D. If existing regulatory mechanisms and corresponding law enforcement were adequate, this threat would be less of a concern. In the absence of adequate law enforcement, we believe that fishing at spawning aggregations is increasing the extinction risk of Nassau grouper.

The final threat analyzed for Factor B was artificial selection. The ERAG scores indicated artificial selection was a ''moderate'' threat; however, ranking of this threat was widely distributed amongst ERAG members, indicating a high level of uncertainty about the effects of artificial selection on Nassau grouper. We recognize the uncertainty associated with this threat and believe more information is needed. That said, we do not believe available information indicates artificial selection is currently impacting the species' risk of extinction.

C. Disease

There is very little information on the impacts of disease, parasites, and abnormalities on Nassau grouper, yet the species is not known to be affected by any specific disease or parasite. Given this, NMFS agrees with the ERAG ranking indicating a ''very low risk'' threat from disease, parasites, and abnormalities. We do not believe any of these threats will rise to the level of impacting the species' status over the foreseeable future.

D. Inadequacy of Existing Regulatory Mechanisms

Consideration of the inadequacy of existing regulatory mechanisms, includes whether enforcement of those mechanisms is adequate. The relevance of existing regulatory mechanisms to extinction risk for an individual species depends on the vulnerability of that species to each of the threats identified under the other factors of ESA section 4, and the extent to which regulatory mechanisms could or do control the threats that are contributing to the species' extinction risk. If a species is not currently, and not expected within the foreseeable future to become, vulnerable to a particular threat, it is not necessary to evaluate the adequacy of existing regulatory mechanisms for addressing that threat. Conversely, if a species is vulnerable to a particular threat (now or in the foreseeable future), we do evaluate the adequacy of existing measures, if any, in controlling or mitigating that threat. In the following paragraphs, we will discuss existing regulatory mechanisms for addressing the threats to Nassau grouper generally, and assess their adequacy for controlling those threats. In the Extinction Risk Analysis section, we determine if the inadequacy of regulatory mechanisms is a contributing factor to the species' status as threatened or endangered because the existing regulatory mechanisms fail to adequately control or mitigate the underlying threats.

Summary of Existing Regulatory Mechanisms

As discussed in detail in the Biological Report (Hill and Sadovy de Mitcheson 2013), a wide array of regulatory mechanisms exists throughout the range of Nassau grouper that are intended to limit harvest and

thus maintain abundance. Existing regulatory mechanisms include minimum size restrictions, seasonal closures, spatial closures, and gear and access restrictions. We summarize some of these regulatory mechanisms below by country.

The Bahamas has implemented a number of regulatory mechanisms to limit harvest. In the 1980s, the Bahamas introduced a minimum size of 3 lbs. (1.36 kg) for Nassau grouper. This was followed in 1998 with a 10-day seasonal closure at several spawning aggregations. An annual ''two-month'' fishery closure was added in December 2003 to coincide with the spawning period and was extended to three months in 2005 to encompass the December through February spawning period. Up until 2015, the implementation of the 3-month closure was determined annually and could be shortened or otherwise influenced by such factors as the economy (Sadovy and Eklund 1999). In 2015, the annual assessment of the closure was removed ensuring a fixed 3-month closure each year moving forward (Fisheries Resources [Jurisdiction and Conservation] [Amendment] Regulations 2015). During the 3-month closure there is a national ban on Nassau grouper catches; however, the Bahamas Reef Educational Foundation (BREEF; unpub. data), has reported large numbers of fish being taken according to fisher accounts with photo-documentation and confirming reports of poaching of the species during the aggregation season.

The Bahamas has implemented several other actions that aid the conservation of Nassau grouper. There are marine parks in the Bahamas that are closed to fishing year round and therefore protect Nassau grouper. The Exuma Cays Land and Sea Park, first established in 1959, has been closed to fishing since 1986, thus protecting both nursery and adult habitat for Nassau grouper and other depleted marine species. Other sites, including the South Berry Islands Marine Reserve (established on December 29, 2008), Southwest New Providence National Park, and North Exumas Study Site have also been established and closed to fishing. Several gear restrictions in the Bahamas are also protective of Nassau grouper. Fishing with SCUBA and the use of explosives, poisons, and spearguns is prohibited in the Bahamas, although snorkeling with sling spears is allowed. The use of bleach or other noxious or poisonous substances for fishing, or possession of such substances on board a fishing vessel, without written approval of the Minister, is prohibited. Commercial fishing in the Bahamas is restricted to only the native population and, as a consequence, all vessels fishing within the Bahamas Exclusive Fishery Zone must be fully owned by a Bahamian citizen residing in the Bahamas.

In Belize, the first measure to protect Nassau grouper was a seasonal closure within the Glover's Reef Marine Reserve in 1993; the area was closed from December 1 to March 1 to protect spawning aggregations. A seasonal closure zone to protect Nassau grouper spawning aggregations was included when the Bacalar Chico marine reserve was established in 1996 (Paz and Truly 2007). Minimum and maximum capture sizes were later introduced (Hill and Sadovy de Mitcheson 2013 and citations therein).

In 2001 the Belize National Spawning Aggregation Working Group established protective legislation for 11 of the known Nassau grouper spawning sites within Belize. Seven of those 11 sites are monitored as regularly as possible. The Working Group meets regularly to share data and develop management strategies (*www.spagbelize.org;* retrieved on 15 April 2012). In 2003, Belize introduced a four-month closed season to protect spawning fish (O'Connor 2002, Gibson 2008). However, the 2003 legislation also allowed for exemptions to the closures by special license granted by the Fisheries Administrator, provided data be taken on any Nassau grouper removed. These special licenses made it difficult to enforce the national prohibition and in 2010 Belize stopped issuing permits to fish for Nassau grouper during the 4-month spawning period, except at Maugre Caye and Northern Two Caye.

In 2009, Belize issued additional protective measures to help manage and protect the Nassau grouper. These include minimum and maximum size limits of 20 inches and 30 inches, respectively. Belize has also introduced a plan to ban spear fishing within all marine reserves (yet to be implemented). Furthermore, as a large proportion of finfish are landed as fillets, the new regulations require that all Nassau grouper be landed whole, and if filleted must have a 1-inch by 2-inch skin patch (The Belize Spawning Aggregation Working Group 2009). Other gear restrictions are in place to generally aid in the management of reef fish, such as no spearfishing on compressed air.

Although Bermuda closed red hind aggregation sites in 1974, Nassau grouper aggregation sites located seaward of these sites were not included and continued to be fished. In 1990, a two-fish bag limit and minimum size restriction (35.6 cm FL) were enacted in Bermuda (Luckhurst 1996). Since 1996, Nassau grouper has been completely protected through a prohibition on take and possession and likely benefits from numerous no-take marine reserves (Hill and Sadovy de Mitcheson 2013).

In the Cayman Islands, the three main (''traditional'') grouper ''holes'' were officially protected in the late 1970's and only residents were allowed to fish by lines during the spawning season (Hill and Sadovy de Mitcheson 2013). In 1986, increasing complaints from fishermen of a decline in both numbers and size of Nassau grouper taken from the fishery prompted the implementation of a monitoring program by the Department of the Environment (Bush *et al.* 2006).

Following the development of the monitoring program, the Cayman Islands implemented a number of management measures. In the early 1990s, legislation prohibited spearfishing at spawning aggregation sites. In 1998, the three main grouper holes at the eastern end of the islands were formally designated as ''Restricted Marine Areas'' where access requires licensing by the Marine Conservation Board (Bush *et al.* 2006). In February 2002, protective legislation defined a spawning season as November 1 to March 31, and an ''Alternate Year Fishing'' rule was passed. This law allowed fishing of the spawning aggregations to occur every other year with the first non-fishing year starting in 2003. A catch limit of 12 Nassau grouper per boat, per day during fishing years was also set. The 2002 law defined a one nautical mile (nm) ''no trapping'' zone around each spawning site, and set a minimum size limit of 12 inches for Nassau grouper in response to juveniles being taken by fish traps inside the sounds (Whaylen *et al.* 2004, Bush *et al.* 2006). In 2003, spearguns were restricted from use within 1 nm of any designated grouper spawning area from November through March. In 2008, it was prohibited to take any Nassau grouper by speargun anywhere in Cayman waters. Effective December 29, 2003, the Marine Conservation Board, closed fishing at all designated Nassau grouper spawning sites for a period of 8 years. The conservation measure was renewed for a further 8 years in 2011.

In Cuba, there is a minimum size limit for Nassau grouper though this regulation is largely unprotective. The minimum size of 32 cm TL (or 570g) for Nassau grouper is less than the reported average size at maturity of 50 cm TL, indicating that Nassau grouper can be harvested before having the opportunity

to reproduce. Of some benefit to Nassau grouper are more general fishing regulations such as bag limits for recreational fishing, regulations to increase selectivity of fishing gears to avoid the catch of juveniles, limits of net use during spawning aggregation time, and controls of speargun use, both commercially and recreationally. Marine protected areas have also been introduced throughout the country. In 2002, the total number of recreational licenses was limited to 3,500 for the whole country hoping to reduce directed fishing pressure nationally.

In Mexico, following scientific documentation of declines of Nassau grouper at Mahahual (Aguilar-Perera 1994), two regulations were enacted: (1) In 1993 spear-fishing was banned at any spawning aggregation site in southern Quintana Roo; and (2) in 1997 the fishing of any grouper species was banned during December and January (Aguilar-Perera 2006). Then, in 2003, a closed season for all grouper was implemented from February 15 to March 15 in all waters of the Mexican Exclusive Economic Zone. Although aimed at protecting red grouper this closure also protects Nassau grouper during a part of its spawning season (Aguilar-Perera *et al.* 2008). A management plan was to have gone into effect in 2012 to protect all commercially exploited groupers in Mexico's southern Gulf of Mexico and Caribbean Sea; yet at this time the plan has not been implemented.

In the Turks and Caicos Islands, the only documented Nassau grouper spawning aggregation site is protected from fishing in Northwest Point Marine National Park, Providenciales (DECR 2004; National Parks Ordinance and Subsidiary Legislation CAP. 80 of 1988). Similar to situations in other countries, protection of Nassau grouper habitat and spawning migration corridors on the narrow ledge of Caicos Bank is problematic as it would impose economic hardship on local fishers who depend on those areas for commercial species (*e.g.,* spiny lobsters) and subsistence fishing (Rudd 2001).

In U.S. federal waters, including those federal waters around Puerto Rico and the U.S.V.I., take and possession of Nassau grouper have been prohibited since 1990. Since 1993, a ban on fishing/possessing Nassau grouper was implemented for the state of Florida and has since been enacted in all U.S. state waters. The species was fully protected in both state and federal waters of Puerto Rico by 2004. The Caribbean Fishery Management Council, with support of local fishermen, established a no-take marine protected area off the southwest coast of St. Thomas, U.S.V.I. in 1990. This area, known as the Hind Bank Marine Conservation District (HBMCD), was intended to protect red hind and their spawning aggregations, as well as a former Nassau grouper spawning site (Brown 2007). The HBMCD was first subject to a seasonal closure beginning in 1990 (Beets and Friedlander 1999, Nemeth 2005, Nemeth *et al.* 2006) to protect spawning aggregations of red hind, and was later closed to fishing year-round in 1998 (DPNR 2005). Additional fishing restrictions in the U.S.V.I. such as gear restrictions, rules on the sale of fish, and protected areas such as the Virgin Islands Coral Reef National Monument and Buck Island Reef National Monument where all take is prohibited, Virgin Islands National Park (commercial fishing prohibited), and several U.S.V.I. marine reserves offer additional protection to Nassau grouper. In 2006, the U.S.V.I. instituted regulations to prohibit harvest and possession of Nassau grouper in territorial waters and filleting at sea was prohibited (García-Moliner and Sadovy 2008).

In Colombia, the San Andrés Archipelago has a number of areas that are designated as no-take fishing zones, and in 2000 the entire archipelago was declared by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as the Seaflower Biosphere Reserve. In 2004, large portions of the archipelago were declared as a system of marine protected areas with varying zones of fisheries management; however, enforcement is largely lacking (M. Prada, Coralina, San Andres, Colombia, pers. comm. R. Hill, NMFS, 2010). Right-to-fish laws in Colombia also require that fishermen be allowed to fish at a subsistence level even within the no-take zones (M. Prada, Coralina, San Andres, Colombia, pers. comm. R. Hill, NMFS, 2010).

There are other Caribbean countries that have either few management measures in place or have yet to implement any conservation measures for Nassau grouper. We are not aware of special conservation or management regulations for Nassau grouper in Anguilla. In Antigua-Barbuda, while Nassau grouper is not specifically managed or protected, closed seasons were considered in 2008 for Nassau grouper and red hind, though the status of these closed seasons is not known. In the British Virgin Islands, there is a closed season for landing Nassau grouper between March 1 and May 31 (Munro and Blok 2005). In the Dominican Republic the catch and sale of ripe female Nassau grouper during the spawning season is not allowed (Bohnsack 1989, Sadovy and Eklund 1999, Box and Bonilla Mejia 2008) and at least one marine park has been established with fishing regulations. In Guadeloupe and Martinique, there are plans to protect the species (F. Gourdin, Regional Activity Center for Specially Protected Areas and Wildlife—UNEP, pers. comm. to Y. Sadovy, University of Hong Kong, 2011) although no details are available at this time. In Honduras, there is no legislation that controls fishing in the snapper/grouper fishery; however, traps and spears are illegal in the Bay Islands. There are no Nassau grouper special regulations in Jamaica; yet, some marine protected areas were designated in 2011.

Analysis of Existing Regulatory Mechanisms

The ERAG considered several threats under Factor D including law enforcement, international trade regulations, foreign regulations in their jurisdictional waters, U.S. federal laws, and U.S. state and territorial laws. The ERAG determined that these threats substantially contribute to the overall risk to the species. Inadequate law enforcement was noted by several ERAG members as influencing their scoring for abundance, fishing of spawning aggregations, commercial harvest, and historical harvest. Inadequate law enforcement led to higher risk scores for each of these threats. The ERAG scored law enforcement as a ''high risk'' threat for Nassau grouper. ERAG rankings for the other threats were widely distributed. The inadequacy of foreign regulations in jurisdictional waters was considered an ''increasing'' risk while the risk of international trade regulations was ''unknown.'' The remaining two categories of regulations (U.S. Federal and State of Florida/U.S. territory regulations) were considered ''low risk'' and ''moderate risk'' respectively. While the ERAG rankings for threats impacting the adequacy of regulatory mechanisms were generally moderate, we believe the concern about fishing at spawning aggregations (''high risk'' according to the ERAG) is due in part to the inadequacy of existing regulatory mechanisms.

Overall, we believe existing regulatory mechanisms throughout the species' range (international trade, foreign, U.S. federal, and U.S. state and territorial regulations) vary in their effectiveness, especially in addressing the most serious threat to Nassau grouper—fishing of spawning aggregations. In some countries, an array of national regulatory mechanisms, increases in marine protected areas, and customary

management may be effective at addressing fishing of spawning aggregations. For example, the Exuma Cays Land and Sea Park (Bahamas), has been closed to fishing for over 25 years and protects both nursery and adult habitat for Nassau grouper and other marine species. In that park, there is a clear difference in the number, biomass, and size of Nassau grouper in comparison to adjacent areas where fishing is permitted (Sluka *et al.* 1997).

We note, however, that many countries have few, if any, specific Nassau grouper regulations. Instead they rely on general fisheries regulations (*e.g.,* Anguilla, Antigua-Barbuda, Colombia, and Cuba all rely only on size limits, while Guadeloupe and Martinique, Honduras, Jamaica, Mexico, St. Lucia, and the Turks and Caicos rely on a variety of general fishing regulations). Additionally, where Nassau grouper-specific regulations do exist, the ERAG scores indicated that law enforcement still presents a high risk threat to the species. We agree with the ERAG's risk assessment and believe that law enforcement in many foreign countries is less than adequate, thus rendering the regulations ineffective.

Some foreign regulations may be ephemeral, unprotective of migrating adults, or inadequate to conserve the viability of a species. In some cases, regulations do not completely protect all known spawning aggregations (*e.g.,* Belize, where 2 spawning aggregations are fished by license). In another instance, we found no protections for Nassau grouper in any foreign country during the period they move to and from spawning aggregation sites. Foreign regulations in some countries specify exemptions for ''historical,'' ''local,'' or artisanal fishermen (*e.g.,* Colombia). Finally, some particular types of regulations are insufficient to protect the species (*e.g.,* minimum size limits in both the Bahamas and Cuba are less than size-at-maturity).

In some places, such as Bermuda, no recovery has been documented after years of regulations (B. Luckhurst, Bermuda Department of Agriculture, Fisheries, and Parks, pers. comm. to Y. Sadovy, University of Hong Kong, September, 2012). In other places (*e.g.,* Cayman Islands) there are indications of potential recovery at spawning aggregation sites, but fishing continues to keep the population depressed (Semmens *et al.* 2012) and inconsistent surveys do not provide data adequate to realize impacts. Additionally, larval recruitment is highly variable due to currents in the Caribbean basin. Some populations may receive larval input from neighboring spawning aggregations, while other local circulation patterns may entrain larvae (Colin *et al.* 1987) making the population entirely self-recruiting.

In conclusion, although many countries have taken regulatory measures to conserve Nassau grouper, the species faces an ongoing threat due to the inadequacy of regulatory mechanisms to prevent or remediate the impacts of other threats that are elevating the species' extinction risk, particularly fishing of spawning aggregations.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

The ERAG considered climate change as a threat to Nassau grouper including global warming, sea level rise, and ocean acidification for Factor E. Although Nassau grouper occur across a range of temperatures, spawning occurs when sea surface temperatures range between 25 °C–26 °C (Colin 1992, Tucker and Woodward 1996). Because Nassau grouper spawn in a narrow window of temperatures, a rise in sea surface temperature outside that range could impact spawning or shift the geographic range of it to overlap with waters within the required temperature parameters. Increased sea surface temperatures have also been linked to coral loss through bleaching and disease. Further, increased global temperatures are also predicted to change parasite-host relationships and may present additional unknown concerns (Harvell *et al.* 2002, Marcogliese 2001). Rising sea surface temperatures are also associated with sea level rise. If sea level changed rapidly, water depth at reef sites may be modified with such rapidity that coral and coral reefs could be affected (Munday *et al.* 2008).

Another potential effect of climate change could be the loss of structural habitat in coral reef ecosystems as ocean acidification is anticipated to affect the integrity of coral reefs (Munday *et al.* 2008). Bioerosion may reduce the 3-dimensional structure of coral reefs (Alvarez-Filip *et al.* 2009), reducing adult habitat for Nassau grouper (Coleman and Koenig 2010, Rogers and Beets 2001). Results of the ERAG scores indicated that climate change was an ''unknown risk'' to Nassau grouper. We agree with the assessment of the ERAG and believe there is not enough information at this time to determine how climate change is affecting the extinction risk of Nassau grouper now or in the foreseeable future.

The ERAG also considered threats from aquaculture to Nassau grouper under Factor E and determined that aquaculture was a ''very low'' risk threat to Nassau grouper. Experiments to determine the success rate of larval Nassau grouper culture (Watanabe *et al.* 1995a, 1995b) and survival of released hatchery-reared juveniles have been conducted and feasibility of restocking reefs has been tested (Roberts *et al.* 1995) in St. Thomas, U.S.V.I. However, the potential of Nassau grouper stock enhancement, as with any other grouper species, has yet to be determined (Roberts *et al.* 1995). Serious concerns about the genetic consequences of introducing Nassau grouper raised in facilities, possible problems of juvenile habitat availability, introduction of maladapted individuals, and the inability of stocked individuals to locate traditional spawning locations, continue to be raised. Given the number of concerns with aquaculture and the fact that some spawning aggregations remain, we believe that it is unlikely that Nassau grouper aquaculture will develop further. Therefore we agree with the ERAG that aquaculture presents a very low extinction risk to Nassau grouper and is not contributing to the species' current status.

Demographic factors of abundance, population growth rate/productivity and diversity were also considered by the ERAG under Factor E. Each ERAG member considered whether the species is likely to be able to maintain a sustainable population size and adequate genetic diversity. They also considered whether the species is at risk due to a loss in the breeding population, which leads to a reduction in survival and production of eggs and offspring. Trends or shifts in demographic or reproductive traits were considered when assessing the ranking of threats by each ERAG member to identify a decline in population growth rate. The ERAG scores indicated that abundance of Nassau grouper was a ''moderate risk,'' growth rate/productivity was an ''increasing risk,'' and that diversity was a ''moderate risk.'' We agree with these rankings and believe they are supported by the declining number and size of spawning aggregations, which affects growth rate/productivity and diversity.

NMFS's Conclusions From Threats Evaluation

The most serious threats to Nassau grouper are fishing at spawning aggregations and inadequate law enforcement. These threats, considered under Factors B and D, were rated by the ERAG as ''high risk'' threats to the species. We agree with the ERAG's assessment that these threats are currently affecting the status of Nassau grouper, putting it at a heightened risk

of extinction. A variety of other threats were identified by the ERAG as also impacting the status of this species. Growth rate/productivity (Factor E), spatial structure/connectivity (Factors A and E), and effectiveness of foreign regulations (Factor D) were identified by the ERAG as ''increasing risks.'' Artificial selection (Factor B), abundance (Factors B and E), diversity (Factor E), commercial harvest (Factors B and D), and effectiveness of state and territory regulations (Factor D) were determined to be ''moderate risks.'' NMFS concurs that these threats have the potential to adversely affect the status of Nassau grouper over the foreseeable future.

Extinction Risk Analysis

We must assess the ERA results and make a determination as to whether the Nassau grouper is currently in danger of extinction, or likely to become so within the foreseeable future. We first evaluated the current status of the Nassau grouper in light of the four demographic factors. Based on our assessment of the ERA in regards to these demographic factors (abundance, growth rate/productivity, spatial structure and connectivity, and diversity) we do not believe the Nassau grouper is currently in danger of extinction. Each of these demographic factors was ranked by the ERAG as a moderate or increasing risk to the species' current status.

We acknowledge that the abundance of Nassau grouper has been dramatically reduced in relation to historical records, but we do not believe abundance is currently so low that the species is at risk of extinction from stochastic events, environmental variation, anthropogenic perturbations, lack of genetic diversity, or depensatory processes. Although the reduced abundance of Nassau grouper has diminished the size and number of spawning aggregations, spawning is still occurring and abundance is increasing in some locations (*e.g.* Cayman Islands and Bermuda) where adequate protections are effectively being implemented. The abundance of Nassau grouper is now patchily distributed throughout the Caribbean with areas of higher abundance correlated with those areas with effective regulations. We believe the abundance of Nassau grouper in these protected areas is large enough to sustain the overall population and limit extinction risk. However, we also believe that further regulations will be necessary in other countries to counteract past population declines and ultimately recover the population of Nassau grouper throughout the Caribbean.

Abundance is closely related with the other three demographic factors. Growth rate/productivity, spatial structure and connectivity, and diversity are all negatively affected by decreased abundance associated with overexploitation. Historical overfishing has led to a decreased average length and earlier age at maturity in exploited populations, which affects the species' ability to maintain the population growth rate above replacement level. Reductions in the number and distribution of spawning aggregations has the potential to affect larval and juvenile dispersal. This can further affect genetic diversity within the population. However, we don't believe that any of these demographic factors have been adversely affected to the point that Nassau grouper is currently in danger of extinction. As described previously, the species continues to occupy its current range, spawning is still occurring in several locations thus continuing to deliver new recruits to the population, and recovery of spawning aggregations has been documented in locations with adequate regulatory mechanisms and enforcement. The size of Nassau grouper is also increasing in areas where protections are in place (*e.g.,* Belize and U.S.V.I.), indicating that current abundance is not adversely affecting growth rate and productivity at these locations.

After considering the current status of Nassau grouper based on the four demographic factors, we next assessed how the identified threats are expected to affect the status of the species, including its demographic factors, over the foreseeable future. The ERAG identified a variety of threats that have the potential to impact Nassau grouper. The ERAG ranked and we agreed that several threats (habitat alteration, disease, aquaculture, and U.S. federal regulations) ranked as ''very low'' or ''low'' risk, will have little to no effect on the extinction risk of Nassau grouper within the foreseeable future. Several other threats (commercial harvest, artificial selection, foreign regulations within jurisdictional waters, and regulations of the U.S. and its territories), were ranked as moderate or increasing risks to the status of Nassau grouper. We agree that collectively these threats could cause Nassau grouper to become in danger of extinction within the foreseeable future.

Finally, the ERAG identified three threats that present a ''high'' risk to the status of Nassau grouper over the foreseeable future. We agree with the ERAG's assessment that fishing of spawning aggregations combined with inadequate law enforcement is currently adversely affecting the status of Nassau grouper as discussed above, but disagree with the ERAG's ranking of historic harvest as a high risk. These high risk threats will continue to elevate the extinction risk of Nassau grouper over the foreseeable future. Both threats directly affect the current abundance of the species, its ability to maintain population growth rate, the population structure of the species, and its diversity in terms of genetics and overall ecology.

As previously described, the ERAG analyzed inadequate law enforcement as a standalone threat under Factor D, inadequacy of existing regulatory mechanisms, and ranked it as a ''high risk'' threat. We agree that existing regulations, and enforcement of existing regulations, are inadequate to control the threat posed by fishing on spawning aggregations, and thus this threat under Factor D is contributing to the extinction risk and status of Nassau grouper.

Based on the information in the Biological Report and the results from the ERA, we conclude that ESA Factors B (overutilization for commercial, recreational, scientific, or educational purposes), D (inadequacy of regulatory mechanisms), and E (other natural or manmade factors) are contributing to a threatened status for Nassau grouper. Overutilization in the form of historical harvest has reduced population size and led to the collapse of spawning aggregations in many locations. While some countries have made efforts to curb harvest, fishing at spawning aggregation sites remains a ''high risk'' threat. Further contributing to the risk of Nassau grouper extinction is the inadequacy of regulatory control and law enforcement, which leads to continued overutilization (low abundance), reduced reproductive output, and reduced recruitment. If growth and sexual recruitment rates cannot balance the loss from these threats, populations will become more vulnerable to extinction over the future (Primack 1993).

Protective Efforts

Section 4(b)(1)(A) of the ESA requires the Secretary, when making a listing determination for a species, to take into consideration those efforts, if any, being made by any State or foreign nation to protect the species. To evaluate the efficacy of domestic efforts that have not yet implemented or that have been implemented, but have not yet demonstrated to be effective, the Services developed a joint ''Policy for Evaluation of Conservation Efforts When Making Listing Decisions'' (''PECE''; 68 FR 15100; March 28, 2003).

The PECE is designed to ensure consistent and adequate evaluation on whether domestic conservation efforts that have been recently adopted or implemented, but not yet proven to be successful, will result in recovering the species to the point at which listing is not warranted or contribute to forming the basis for listing a species as threatened rather than endangered. The PECE is expected to facilitate the development of conservation efforts by states and other entities that sufficiently improve a species' status so as to make listing the species as threatened or endangered unnecessary.

The PECE establishes two overarching criteria to use in evaluating efforts identified in conservations plans, conservation agreements, management plans or similar documents: (1) The certainty that the conservation efforts will be implemented; and (2) the certainty that the efforts will be effective. While section 4(b)(1)(A) requires that we evaluate both domestic and foreign conservation efforts, it does not set out particular criteria for doing so. While the particular framework of the PECE policy only directly applies to consideration of domestic efforts, we have discretion to evaluate foreign efforts using a similar approach and find that it is reasonable to do so here. In our discretion, we evaluated foreign conservation efforts to protect and recover Nassau grouper that are either underway, but not yet fully implemented, or are only planned, using these overarching criteria.

Conservation efforts with the potential to address identified threats to Nassau grouper include, but are not limited to, fisheries management plans, education about overfishing and fishing of spawning aggregations, and projects addressing the health of coral reef ecosystems. These conservation efforts may be conducted by countries, states, local governments, individuals, NGOs, academic institutions, private companies, individuals, or other entities. They also include global conservation organizations that conduct coral reef and/or marine environment conservation projects, global coral reef monitoring networks and research projects, regional or global conventions, and education and outreach projects throughout the range of Nassau grouper.

The Biological Report summarizes known conservation efforts, including those that have yet to be fully implemented or have yet to demonstrate effectiveness. Conservation efforts that we considered that are yet to be fully implemented include Mexico's 2012 proposed management plan, Antigua-Barbuda's 2008 closed season proposal, and Guadeloupe and Martinique's plans to protect the species. Because these proposed plans are several years old with no updates or known implementation, we find that there is not a sufficient basis to conclude that there is a reasonable certainty of implementation or effectiveness. We also considered the marine protected areas implemented by Jamaica in 2011, though based on Jamaica's historic overfishing and difficulty in enforcing existing regulations, we find that there is not a sufficient basis to conclude that these marine protected areas present a reasonable certainty of effectiveness in reducing threats that contribute to Nassau grouper's extinction risk. We carefully considered the other conservation efforts summarized in the Biological Report and acknowledge that time is required to see the benefit of mature adults in the spawning aggregations; however, the continued decline in number and size of Nassau grouper spawning aggregations indicates the effectiveness of those conservation efforts is currently unknown and thus there is insufficient basis to conclude there is a reasonable certainty of effectiveness. While some conservation efforts have been partially successful on localized scales, Nassau grouper appear to still be overutilized and at heightened risk of extinction based on the ERA. After taking into account these conservation efforts, our evaluation of the section 4(a)(1) factors is that the conservation efforts do not reduce the risk of extinction of Nassau grouper to the point at which listing is not warranted.

Significant Portion of Range

There are two situations under which a species is eligible for listing under ESA: A species may be endangered or threatened throughout all of its range or a species may be endangered or threatened throughout only a ''significant portion of its range'' (SPOIR). Although the ESA does not define ''SPOIR,'' NMFS and the U.S. Fish and Wildlife Service (USFWS) published a final policy clarifying their interpretation of this phrase (79 FR 37577; July 7, 2014). Under the policy, if a species is found to be endangered or threatened throughout only a significant portion of its range, the entire species is subject to listing and must be protected everywhere. A portion of a species' range is ''significant'' if ''. . . the species is not currently endangered or threatened throughout its range, but the portion's contribution to the viability of the species is so important that, without the members in that portion, the species would be in danger of extinction, or likely to become so in the foreseeable future, throughout all of its range.'' Thus, if the species is found to be threatened or endangered throughout its range, we do not separately evaluate portions of the species' range.

Although the SPOIR Policy had yet to go into effect during our status review of Nassau grouper, we considered the interpretations and principles contained in the 2014 Draft Policy with regards to the Nassau grouper and completed an assessment of potential ''SPOIR,'' which is documented in the ERA. However, throughout the status review process NMFS determined threats and risks to the status of Nassau grouper are affecting the species over the entirety of its range. Because the threats and risks are widespread throughout the entire range of this species, there is no portion of the range that can be considered ''significant.''

Listing Determination

Based on the Biological Report, the Threats Evaluation, the Extinction Risk Analysis, and Protective Efforts we determined that the Nassau grouper warrants a threatened status under the ESA. We summarize the results of our comprehensive status review as follows: (1) The species is made up of a single population over a broad geographic range, and its current range is indistinguishable from its historical range; (2) the species possesses life history characteristics that increase vulnerability to unregulated harvest; (3) historical harvest greatly diminished the population of Nassau grouper and the species has yet to recover from this overexploitation; (4) spawning aggregations have drastically declined in size and number across the species' range; (5) there are two threats the ERAG rated as ''high risk,'' that we agree are affecting the current status of the species and will continue to do so over the foreseeable future—fishing at spawning aggregations and inadequate law enforcement; and (6) historical harvest has abated, though existing regulatory mechanisms and law enforcement have not been effective in preventing fishing at many spawning aggregation sites. Conservation efforts in some nations (U.S., Puerto Rico, U.S.V.I., and Belize) have almost certainly prevented further declines. Given the life history characteristics of Nassau grouper, more time will be needed to determine if these protective measures are successful in recovering the population. Collectively, the information obtained during the status review indicates the species is not currently in danger of extinction

(though reduced in number, the species maintains its historical range and still forms spawning aggregations at some sites), but it is likely to become endangered within the foreseeable future (based on continued risk of harvest, especially at spawning aggregation sites inadequately controlled by regulations and law enforcement). Accordingly, we have determined that the Nassau grouper warrants listing as a threatened species under the ESA.

Effects of Listing

Conservation measures provided for species listed as endangered or threatened under the ESA include recovery plans (16 U.S.C. 1533(f)), critical habitat designations (16 U.S.C. 1533(a)(3)(A)), Federal agency consultation requirements (16 U.S.C. 1536), and protective regulations (16 U.S.C. 1533(d)). Recognition of the species' status through listing promotes conservation actions by Federal and state agencies, private groups, and individuals, as well as the international community. Both a recovery program and designation of critical habitat could result from this final listing. Given its broad range across the Caribbean Sea, a regional cooperative effort to protect and restore Nassau grouper is necessary. We anticipate that protective regulations for Nassau grouper will also be necessary for the conservation of the species. Federal, state, and the private sectors will need to cooperate to conserve listed Nassau grouper and the ecosystems upon which they depend.

Identifying ESA Section 7 Consultation Requirements

Section 7(a)(2) of the ESA and NMFS/FWS regulations require Federal agencies to consult with us on any actions they authorize, fund, or carry out if those actions may affect the listed species or designated critical habitat. Based on currently available information, we can conclude that examples of Federal actions that may affect Nassau grouper include, but are not limited to, artificial reef creation, dredging, pile-driving, military activities, and fisheries management practices.

Critical Habitat

Critical habitat is defined in section 3 of the ESA (16 U.S.C. 1532(5)) as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination that such areas are essential for the conservation of the species. ''Conservation'' means the use of all methods and procedures needed to bring the species to the point at which listing under the ESA is no longer necessary. Critical habitat may also include areas unoccupied by Nassau grouper if those areas are essential to the conservation of the species.

Section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, to the maximum extent prudent and determinable, critical habitat be designated concurrently with the listing of a species. Pursuant to 50 CFR 424.12(a), designation of critical habitat is not determinable when one or both of the following situations exist: Data sufficient to perform required analyses are lacking; or the biological needs of the species are not sufficiently well known to identify any area that meets the definition of ''critical habitat.'' Although we have gathered information through the status review and public comment periods on the habitats occupied by this species, we currently do not have enough information to determine what physical and biological features within those habitats facilitate the species' life history strategy and are thus essential to the conservation of Nassau grouper, and may require special management considerations or protection. To the maximum extent prudent and determinable, we will publish a proposed designation of critical habitat for Nassau grouper in a separate rule. Designations of critical habitat must be based on the best scientific data available and must take into consideration the economic, national security, and other relevant impacts of specifying any particular area as critical habitat. Once critical habitat is designated, section 7 of the ESA requires Federal agencies to ensure that they do not fund, authorize, or carry out any actions that are likely to destroy or adversely modify that habitat. This requirement is in addition to the section 7 requirement that Federal agencies ensure that their actions do not jeopardize the continued existence of listed species.

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

Because we are proposing to list Nassau grouper as threatened, the ESA section 9 prohibitions do not automatically apply. Therefore, pursuant to ESA section 4(d), we will evaluate whether there are protective regulations we deem necessary and advisable for the conservation of Nassau grouper, including application of some or all of the take prohibitions. If protective regulations are deemed necessary, a proposed 4(d) rule would be subject to public comment.

Policies on Peer Review

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing minimum peer review standards, a transparent process for public disclosure of peer review planning, and opportunities for public participation. The OMB Bulletin, implemented under the Information Quality Act (Pub. L. 106–554) is intended to enhance the quality and credibility of the Federal government's scientific information, and applies to influential or highly influential scientific information disseminated on or after June 16, 2005. To satisfy our requirements under the OMB Bulletin, we obtained independent peer review of the Biological Report. Five independent specialists were selected from the academic and scientific community, Federal and state agencies, and the private sector for this review (with three respondents). All peer reviewer comments were addressed prior to dissemination of the final Biological Report and publication of this final rule.

Solicitation of Information

We are soliciting information on features and areas that may support designation of critical habitat for Nassau grouper. Information provided should identify the physical and biological features essential to the conservation of the species and areas that contain these features. Areas outside the occupied geographical area should also be identified if such areas themselves are essential to the conservation of the species. Essential features may include, but are not limited to, features specific to the species' range, habitats, and life history characteristics within the following general categories of habitat features: (1) Space for individual growth and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for reproduction and development of offspring; and (5) habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of the species (50 CFR 424.12(b)). ESA implementing regulations at 50 CFR 424.12(h) specify that critical habitat shall not be

designated within foreign countries or in other areas outside of U.S. jurisdiction. Therefore, we request information only on potential areas of critical habitat within waters in U.S. jurisdiction.

For features and areas potentially qualifying as critical habitat, we also request information describing: (1) Activities or other threats to the essential features or activities that could be affected by designating them as critical habitat, and (2) the positive and negative economic, national security and other relevant impacts, including benefits to the recovery of the species, likely to result if these areas are designated as critical habitat.

References

A complete list of the references used in this final rule is available at: (*http://sero.nmfs.noaa.gov/protected_resources/listing_petitions/species_esa_consideration/index.html*).

Classifications

National Environmental Policy Act

The 1982 amendments to the ESA, in section 4(b)(1)(A), restrict the information that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in *Pacific Legal Foundation* v. *Andrus,* 675 F. 2d 825 (6th Cir. 1981), NMFS has concluded that ESA listing actions are not subject to the environmental assessment requirements of the National Environmental Policy Act (See NOAA Administrative Order 216–6).

Executive Order 12866, Regulatory Flexibility Act and Paperwork Reduction Act

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

Executive Order 13132, Federalism

In keeping with the intent of the Administration and Congress to provide continuing and meaningful dialogue on issues of mutual state and Federal interest, the proposed rule was provided to the relevant agencies in each state in which the subject species occurs, and these agencies were invited to comment. We did not receive comments from any state agencies.

Executive Order 12898, Environmental Justice

Executive Order 12898 requires that Federal actions address environmental justice in the decision-making process. In particular, the environmental effects of the actions should not have a disproportionate effect on minority and low-income communities. This final rule is not expected to have a disproportionately high effect on minority populations or low-income populations.

List of Subjects in 50 CFR Part 223

Endangered and threatened species, Exports, Transportation.

Dated: June 21, 2016.

Samuel D Rauch, III,

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

For the reasons set out in the preamble, we amend 50 CFR part 223 as follows:

PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

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

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

■ 2. In § 223.102, amend the table in paragraph (e) by adding an entry under the ''Fishes'' subheading for ''Grouper, Nassau'' in alphabetical order to read as follows:

§ 223.102 Enumeration of threatened marine and anadromous species.

* * * * *

(e) * * *

Species [1]			Citation(s) for listing determination(s)	Critical habitat	ESA rules
Common name	Scientific name	Description of listed entity			
*	*	*	*	*	*
FISHES					
*	*	*	*	*	*
Grouper, Nassau	*Epinephelus striatus* ..	Entire species	*[Insert* ***Federal Register*** *citation],* June 29, 2016.	NA	NA
*	*	*	*	*	*

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991).

* * * * *

[FR Doc. 2016–15101 Filed 6–28–16; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 600

[Docket No. 111014628–6513–02]

RIN 0648–BB54

Magnuson-Stevens Fishery Conservation and Management Act Provisions; Implementation of the Shark Conservation Act of 2010

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

ACTION: Final rule.

SUMMARY: This final action updates agency regulations consistent with provisions of the Shark Conservation Act of 2010 (SCA) and prohibits any person from removing any of the fins of a shark at sea, possessing shark fins on board a fishing vessel unless they are naturally attached to the corresponding carcass, transferring or receiving fins from one vessel to another at sea unless the fins are naturally attached to the corresponding carcass, landing shark fins unless they are naturally attached to the corresponding carcass, or landing shark carcasses without their fins naturally attached. This action amends existing regulations and makes them consistent with the SCA.

DATES: Effective July 29, 2016.

ADDRESSES: Copies of the Environmental Assessment (EA)/Regulatory Impact Review (RIR)/Final Regulatory Flexibility Analysis (FRFA) prepared for this action can be obtained from: Erin Wilkinson, National Marine Fisheries Service, 1315 East-West Highway, Room 13437, Silver Spring MD 20910. An electronic copy of the EA/RIR/FRFA document as well as copies of public comments received can be viewed at the Federal e-rulemaking portal: *http://www.regulations.gov/* (Docket ID: NOAA–NMFS–2012–0092).

FOR FURTHER INFORMATION CONTACT: Erin Wilkinson by phone at 301–427–8561, or by email: *erin.wilkinson@noaa.gov* or *sca.rulemaking@noaa.gov.*

SUPPLEMENTARY INFORMATION:

I. Overview of the Shark Conservation Act

Background information and an overview of the Shark Conservation Act can be found in the preamble of the proposed rule published on May 2, 2013 (78 FR 25685). Copies are available from NMFS (see **ADDRESSES**), or can be viewed electronically at the Federal E-Rulemaking portal for this action: *http://www.regulations.gov.*

II. Major Components of the Final Action

Retaining a shark fin while discarding the shark carcass (shark finning) has been prohibited in the United States since the 2000 Shark Finning Prohibition Act. The 2010 SCA included provisions that amended the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to prohibit any person from: (1) Removing any of the fins of a shark (including the tail) at sea; (2) having custody, control, or possession of a fin aboard a fishing vessel unless it is naturally attached to the corresponding carcass; (3) transferring a fin from one vessel to another vessel at sea, or receiving a fin in such transfer, unless the fin is naturally attached to the corresponding carcass; or (4) landing a fin that is not naturally attached to the corresponding carcass, or landing a shark carcass without its fins naturally attached. For the purpose of the SCA and these regulations, ''naturally attached,'' with respect to a shark fin, means to be attached to the corresponding shark carcass through some portion of uncut skin.

This action amends NMFS' regulations consistent with these provisions of the SCA. Specifically, the rule amends regulations at 50 CFR part 600, subpart N, to prohibit the removal of shark fins at sea, namely, the possession, transfer and landing of shark fins that are not naturally attached to the corresponding carcass, and the landing of shark carcasses without the corresponding fins naturally attached. In the preamble to the proposed rule, NMFS noted that it interprets the prohibitions in subpart N as applying to sharks, not skates and rays, and solicited public comment on whether clarification was needed in the regulatory text on this issue. See 78 FR 25685, 25686 (May 2, 2013). NMFS received only one public comment on this point, which was supportive of this interpretation, and NMFS thus affirms in this final rule that the prohibitions do not apply to skates and rays.

This final rule also updates subpart N to be consistent with section 103(b) of the SCA regarding an exception for individuals engaged in commercial fishing for smooth dogfish. Interpretation of that exception was addressed in a rule finalized in November 2015, for Amendment 9 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan (November 24, 2015; 80 FR 73128). That final rule, among other things, allows for the at-sea removal of smooth dogfish fins provided that fishing occurs within 50 nautical miles of shore along the Atlantic Coast from Maine through the east coast of Florida; smooth dogfish fin weight does not exceed 12 percent of the carcass weight on board; smooth dogfish make up at least 25 percent of the total retained catch, by weight; and the fisherman/vessel holds both federal and state permits appropriate for the retention of smooth dogfish.

This final rule also combines the existing §§ 600.1203 and 600.1204 into one section. The text throughout 50 CFR part 600, subpart N, is amended to make it consistent with the provisions of the SCA.

The MSA authorizes the Secretary to regulate fisheries seaward of the inner boundary of the U.S. exclusive economic zone (EEZ), which is defined as a line coterminous with the seaward boundary of each U.S. coastal state. 16 U.S.C. 1802(11). Thus, as noted in the proposed rule, the SCA provisions apply to any person subject to the jurisdiction of the United States, including persons on board U.S. and foreign vessels, engaging in activities prohibited under the statute with respect to sharks harvested seaward of the inner boundary of the EEZ. See 78 FR 25685, 25686 (May 2, 2013). Federal regulations pertaining to the conservation and management of specific shark fisheries are set forth in parts 635, 648, and 660 of title 50 of the Code of Federal Regulations. For Atlantic highly migratory species fisheries, as a condition of its Federal permit, a vessel's fishing, catch, and gear are subject to federal requirements even when fishing in state waters. See 50 CFR 635.4(a)(10) (noting also that, when fishing within the waters of a state with more restrictive regulations, persons aboard the vessel must comply with those requirements). This rule amends 50 CFR part 600, subpart N, and does not supersede or amend any other federal regulation or requirement related to the conservation and management of sharks.

The SCA also amended the High Seas Driftnet Fishing Moratorium Protection Act, which provides for identification and certification of nations to address illegal, unreported, or unregulated fishing; bycatch of protected living marine resources; and, as amended by the SCA, shark catches. 16 U.S.C. 1826h–1826k. With regard to sharks, the High Seas Driftnet Fishing Moratorium