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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XD990

Atlantic Highly Migratory Species; Essential Fish Habitat

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

ACTION: Notice of availability of Final Environmental Assessment.

SUMMARY: NMFS announces the availability of a Final Environmental Assessment for Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP). This Final Amendment updates Atlantic HMS essential fish habitat (EFH) based on new scientific evidence or other relevant information and following the EFH delineation methodology established in Amendment 1 to the 2006 Consolidated Atlantic HMS FMP (Amendment 1); updates and considers new habitat areas of particular concern (HAPCs) for Atlantic HMS based on new information, as warranted; minimizes to the extent practicable the adverse effects of fishing on EFH; and identifies other actions to encourage the conservation and enhancement of EFH. This action is necessary

to comply with the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and the National Standard 2 requirement that conservation and management measures be based on the best scientific information available.

DATES: The amendment was approved on August 30, 2017.

ADDRESSES: Electronic copies of Final Amendment 10 to the 2006 Consolidated HMS FMP and associated documents (including maps and shapefiles) may be obtained on the internet at:

www.nmfs.noaa.gov/sfa/hms/documents/fmp/am10/index.html

FOR FURTHER INFORMATION CONTACT: Jennifer Cudney or Randy Blankinship by phone at (727) 824-5399.

SUPPLEMENTARY INFORMATION:

Background

The Magnuson-Stevens Act requires that Fishery Management Plans identify and describe EFH and, to the extent practicable, minimize the adverse effects on EFH caused by fishing, and to also identify other actions to encourage the conservation and enhancement of such habitat. (16 U.S.C. 1853(a)(7)). NMFS has defined EFH as waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (50 CFR 600.10). Federal agencies that

authorize, fund, or undertake actions, or propose to authorize, fund, or undertake actions that may adversely affect EFH must consult with NMFS. In addition, if a Federal or State action or proposed action may adversely affect EFH, NMFS must provide the action agency with recommended measures to conserve EFH (§ 600.815(a)(9)). An adverse effect is defined as an effect that reduces quality and/or quantity of EFH. This includes direct or indirect physical, chemical, or biological alterations of the waters or substrate; loss of, or injury to species and their habitat, and other ecosystem components; or reduction of the quality and/or quantity of EFH. Adverse effects may result from actions occurring within EFH or outside of EFH.

In addition to identifying EFH, NMFS or Regional Fishery Management Councils may designate HAPCs where appropriate. The purpose of a HAPC is to focus conservation efforts on localized areas within EFH that are vulnerable to degradation or are especially important ecologically for managed species. EFH regulatory guidelines encourage the Regional Fishery Management Councils and NMFS to identify HAPCs based on one or more of the following considerations (§ 600.815(a)(8)):

- the importance of the ecological function provided by the habitat;
- the extent to which the habitat is sensitive to human-induced environmental degradation;
- whether, and to what extent, development activities are, or will be, stressing the habitat type; and/or,
- the rarity of the habitat type.

In addition to identifying and describing EFH for managed fish species, NMFS or Regional Fishery Management Councils must periodically review EFH FMP components, and make revisions or amendments, as warranted, based on new scientific evidence or other relevant information (§ 600.815(a)(10)). NMFS commenced this review and solicited information from the public in a *Federal Register* notice on March 24, 2014 (79 FR 15959). The initial public review/submission period ended on May 23, 2014. The Draft Atlantic HMS EFH 5-Year Review was made available on March 5, 2015 (80 FR 11981), and the public comment period ended on April 6, 2015. The Notice of Availability for the Final Atlantic HMS EFH 5-Year Review was published on July 1, 2015 (80 FR 37598) ("5-Year Review").

The 5-Year Review considered data and information regarding Atlantic HMS and their habitats that have become available since 2009 that were not included in EFH updates finalized in Amendment 1 to the 2006 Consolidated HMS FMP (Amendment 1) (June 1, 2010, 75 FR 30484); Final Environmental Impact Statement for Amendment 3 to the 2006 Consolidated HMS FMP (Amendment 3) (June 1, 2010, 75 FR 30484); and the interpretive rule that described EFH for roundscale spearfish (September 22, 2010, 75 FR 57698). NMFS determined that a revision of Atlantic HMS EFH was warranted, and that Amendment 10 to the Atlantic HMS FMP should be developed in order to implement these updates. NMFS determined in the 5-Year Review that the method used in Amendment 1 to delineate Atlantic HMS EFH was still the best approach. This method was therefore applied to complete analyses that support the new amendment.

On September 8, 2016, NMFS published a notice of availability of the Draft Environmental Assessment (EA) for Amendment 10 to the 2006 Consolidated Atlantic HMS FMP (81 FR 62100). Draft Amendment 10 considered all 10 components of EFH listed at § 600.815(a). For evaluation of EFH geographic boundaries, the Draft Amendment incorporated new information

and data that became available to the agency following publication of the previous EFH update (Amendment 1 to the 2006 Consolidated Atlantic HMS FMP in 2009). New information and data came from a literature and data meta-analysis completed as part of the recent EFH 5-Year Review, and from data and information submitted by NOAA scientists and the public during public comment periods. These data sets included sources such as fishery-independent survey data records collected between 2009 - 2014, even for species where there were limited or no new EFH data found in the literature review. A complete list of data sources and information used to update Draft Amendment 10 is available in the Draft EA. Draft Amendment 10 used the same EFH delineation methodology established in Amendment 1 to update EFH boundaries. Draft Amendment 10 proposed alternatives to modify existing HAPCs or designate new HAPCs for bluefin tuna (*Thunnus thynnus*), and sandbar (*Carcharhinus plumbeus*), lemon (*Negaprion brevirostris*), and sand tiger sharks (*Carcharias taurus*); analyzed fishing and non-fishing impacts on EFH through a consideration of environmental and management changes and new information that has become available since 2009; identified ways to minimize to the extent practicable the adverse

effects of fishing activities on EFH; and identified other actions to encourage the conservation and enhancement of EFH.

NMFS sought public comment on Draft Amendment 10 through December 22, 2016. Additionally, NMFS conducted two public hearing conference calls/webinars for interested members of the public to submit verbal comments (81 FR 71076).

Furthermore, NMFS presented information on Draft Amendment 10 to the Caribbean, Gulf of Mexico, South Atlantic, Mid-Atlantic, and New England Fishery Management Councils. NMFS received 26 unique written comments on the Draft Amendment, and received a number of additional comments and/or clarifying questions at the Atlantic HMS Advisory Panel meeting and at Council meetings.

NMFS received multiple comments in support of the proposed updates to EFH and for modification and/or creation of new HAPCs. Among other things, NMFS received comments and suggestions on the following: suggestions to improve EFH analysis methodology; recommendations against the establishment of EFH boundaries for dusky sharks north of a New England management demarcation line; modifications to proposed EFH updates for multiple shark species based on research submitted by commenters; modifications on the

proposed extent of the bluefin tuna HAPC; and requests for inclusion of additional information in the EA.

The Final Amendment modifies EFH for Atlantic HMS (Preferred Alternative 2). When preparing Draft Amendment 10, NMFS identified several new datasets and completed a comprehensive analysis of agency datasets that included the addition of six years of new data (2009 - 2014). Additional relevant datasets were not available in time for inclusion in Draft Amendment 10 but have been included in the Final Amendment 10. These datasets contained Level 1 point data from the Billfish Foundation, the Southeast Area Monitoring and Assessment Program (SEAMAP) ichthyoplankton trawl survey, the SEAMAP Acoustic/Small Pelagics survey, the SEAMAP Shrimp/Bottomfish survey, and the North Carolina Department of Natural Resources inshore gillnet/trawl survey data. There was additional pelagic longline observer data for white marlin was available following publication of Draft Amendment 10.

Given the large number of new data points that became available during and following the public comment period for Draft Amendment 10, NMFS determined that for Final Amendment 10 it was appropriate to rerun models for multiple species.

For example, the inclusion of SEAMAP Acoustic/Small Pelagic and Shrimp/Bottomfish surveys in analyses rerun for Final Amendment 10 added 1,533 data points for angel shark in the Gulf of Mexico. Inclusion of these new data points into the Kernel Density Estimation/95 Percent Volume Contour models resulted in minor modifications to the EFH boundary updates that were previously presented in Draft Amendment 10.

The EFH model output generated for Final Amendment 10 was then subjected to robust scientific peer review and quality assurance/quality control (QA/QC) to ensure that updates to EFH boundaries were sound. The use of robust scientific peer review and QA/QC after models are developed and EFH boundaries are derived from the 95 percent probability boundary is consistent with provisions of the Magnuson-Stevens Act section 305(b)(1)(A). For example, Councils or NMFS may describe, identify, and protect habitats of managed species that are beyond the EEZ; however, such habitat may not be considered EFH for the purposes of the requirements under sections 303(a)(7) and 305(b) of the Magnuson-Stevens Act (§ 600.805(a)(2)). Given these aspects of the EFH regulations, the 95 percent probability boundary derived from models is clipped, or made to match, the seaward

EEZ boundary, depending on where the overlap occurred. Based on the recommendations of NMFS scientists in the Northeast and Southeast Fisheries Science Centers, and in cases where it made biological sense, NMFS clipped polygons to specified features or areas (e.g., bathymetric (depth) contours (isobaths), the continental shelf break, Chesapeake Bay, shorelines). This reflects the known information about these species' habitats. In Final Amendment 10, NMFS provides additional clarifications on the process for QA/QC and scientific peer review considerations of model output (see Appendix F of the EA, see **ADDRESSES** above for instructions on how to view/locate the Final EA). Similarly, NMFS also added a more recently updated definition of shark nursery areas in Final Amendment 10 based on the discussion presented in Heupel *et al.* (2007) to assist in identifying habitats that were considered necessary for neonate/YOY and juvenile life stages of sharks (EFH definition) and/or may have been rare or played a particularly important ecological role (per HAPC criteria) (see Comments 15 and 16 below; see Appendix F of the EA, see **ADDRESSES** above for instructions on how to view/locate the Final EA).

Final Amendment 10 modifies the HAPC for bluefin tuna (Preferred Alternative 3b) and sandbar shark (Preferred Alternative 4b) from that established in Amendment 1 to the 2006 Consolidated HMS FMP. New literature published by Muhling *et al.* (2010) suggests moderate (20-40 percent) probabilities of collecting larvae in areas of the eastern Gulf of Mexico that are not completely covered by the existing HAPC. Based on this information, Final Amendment 10 extends the HAPC for the Spawning, Eggs, and Larval life stage in the Gulf of Mexico from its current boundary of 86° W longitude (long.), eastward to 82° W long. The HAPC extends from the 100-meter isobath to the EEZ, and is based on the distribution of available data and recommendations from the SEFSC during QA/QC review. Final Amendment 10 also adjusts the neonate/YOY sandbar shark HAPC established in the 1999 FMP for Atlantic Tunas, Swordfish, and Sharks such that it is consistent with updates to EFH (Preferred Alternative 2b) in coastal North Carolina, Chesapeake Bay, and Delaware Bay for this life stage. The sandbar shark EFH changes include incorporation of additional area in Delaware Bay and Chesapeake Bay to reflect updated EFH designations, and adjustment of the HAPC around the Outer Banks of North

Carolina to remove areas in Pamlico Sound. The HAPC for sandbar shark designated in 1999 is outside the geographic boundaries of the most recent EFH designation (Amendment 1) for sandbar shark. This alternative would therefore adjust the boundaries of the HAPC so that it is contained within the geographic boundaries of the sandbar shark EFH.

Amendment 10 also creates new HAPCs for juvenile and adult lemon sharks (Preferred Alternative 5b) off southeastern Florida between Cape Canaveral and Jupiter inlet and for sand tiger shark (Preferred Alternative 6b) in Delaware Bay (all life stages) and the Plymouth, Kingston, Duxbury (PKD) Bay system in coastal Massachusetts (neonate/YOY and juveniles). These HAPCs were proposed in the Draft Amendment 10. The new HAPC for juvenile and adult lemon sharks is based upon tagging studies and public comments received that expressed concern about protection of habitat in locations where aggregations of lemon sharks are known to occur. The two new sand tiger shark HAPCs are based on data collected by the NEFSC, Haulsee *et al.* (2014 and 2016), and Kilfoil *et al.* (2014) indicating that Delaware Bay constitutes important habitat for sand tiger sharks.

Response to Comments

NMFS received 26 unique written comments from fishermen, council members, states, environmental groups, academia and scientists, and other interested parties on the Draft EA during the public comment period. Comments included submissions of 17 form letters that were identical or similar to comments provided by organizations. We also received comments from fishermen, states, and other interested parties at Council meetings, Atlantic HMS Advisory Panel meetings, and at two public conference calls/webinars. All written comments can be found at <http://www.regulations.gov>.

Comments are summarized below by major topic together with NMFS' responses.

1. Draft EA Content (Comments 1-2),
2. EFH Methodology (Comments 3-5),
3. Bluefin Tuna EFH Boundary Designations (Comments 6-9),
4. Bluefin Tuna HAPC Alternative (Comments 10-11),
5. Shark EFH Boundary Designations (Comments 12-16),
6. Sandbar Shark HAPC Alternative (Comment 17),
7. Lemon Shark HAPC Alternative (Comments 18-20),
8. Sand Tiger Shark HAPC Alternative (Comments 21-22),
9. Other Comments (Comment 23), and

10. Research and Restoration (Comments 24-26).

Comments By Subject

1. *Draft EA Content*

Comment 1: NMFS received several comments on the content of the Draft EA, requesting information confirming the importance of habitat associations, seasonality of peak EFH utilization, and a rationale for the changes in EFH made between Amendment 1 and Draft Amendment 10.

Response: Habitat association and seasonality information, based on available scientific literature, have been included in both the Life History reviews and EFH Text Descriptions for Atlantic HMS species (see Chapter 6 of the Final EA). If appropriate, NMFS may develop products, such as GIS maps depicting peak seasonal use of EFH by region in the future. A rationale for the changes in EFH between Amendment 1 and those established by Final Amendment 10 is included for each species, where applicable, following EFH Text Descriptions in Chapter 6 of the EA.

Comment 2: NMFS should provide online access to the shapefiles and maps of non-preferred alternatives.

Response: Shapefiles and maps depicting preferred alternative EFH and HAPC boundaries, and maps showing the extent of non-preferred HAPC alternatives, may be downloaded at the following website:

<http://www.nmfs.noaa.gov/sfa/hms/documents/fmp/am10/index.htm>

1. NMFS did not make available shapefiles or maps of the non-preferred EFH boundary alternative (*i.e.*, status quo) on the Amendment 10 website to reduce confusion between what EFH designations are currently in effect and what is being considered in this amendment. Shapefiles representing the previous EFH revision exercise, which reflect the status quo - no action alternative in Draft Amendment 10, are available on the website for Amendment 1 to the 2006 Consolidated Atlantic HMS FMP.

2. EFH Methodology

Comment 3: Preferred Alternative 2, which updates all Atlantic HMS EFH designations using the methodology established under Amendment 1, is appropriate.

Response: NMFS concurs that it is appropriate to update Atlantic HMS EFH using new data collected since 2009 and the methodology established under Amendment 1. Review and updates of Atlantic HMS EFH are consistent with the EFH

provisions of the Magnuson-Stevens Act and National Standard 2 (*i.e.*, that conservation and management measures be based on the best scientific information available). During the 5-Year Review process, NMFS evaluated 11 different approaches used to assess EFH by the Agency or published in the literature, and determined that the methodology established under Amendment 1 remained the best approach to update Atlantic HMS EFH.

Comment 4: NMFS should consider designations of EFH by depth (surface, middle, and bottom) where appropriate and if there is scientific information that supports such a designation.

Response: EFH text descriptions (see Chapter 6 of the EA) include references to depth where appropriate based on best available scientific information. EFH delineation in other sections of the water column could be useful in Habitat Consultations; however, information describing vertical distribution and habitat utilization in the water column are not available for all Atlantic HMS species in the literature. While NMFS did not specifically request vertical depth data from the public during the 5-Year Review and Draft Amendment comment periods, NMFS generally requested information on

relevant EFH data and ideas for delineation methods and no data on vertical depth distribution data were submitted. NMFS may explore new models and approaches in the future, and at that time, could evaluate the feasibility of designating EFH vertically through the water column for Atlantic HMS.

Comment 5: The methods used to delineate EFH may bias results. Sampling intensity can affect the observed density, particularly for larvae, as well as for determining the distribution of other species, which impacts EFH designations. In those cases, EFH becomes a function of data availability, not a function of animal behavior.

Response: The current approach to designating EFH uses an unweighted model that delineates contour intervals around data points; therefore, the models are influenced by sampling intensity, the spatial distribution of data, and data availability. Several Atlantic HMS species are data-poor, and the available datasets may provide data points that are clustered in space or time based on the extent of sampling. NMFS may explore alternative models and approaches in the future, if appropriate, that better account for the spatial distribution of available data and other biases that may influence results.

3. Bluefin Tuna EFH Boundary Designations

Comment 6: NMFS received comments both supporting and not supporting the inclusion of the Slope Sea into the bluefin tuna EFH for the Spawning, Eggs, and Larval life stage. Some commenters supported the inclusion of Slope Sea spawning areas into EFH designations for this life stage because this reflects the best available scientific information. Other commenters voiced opposition to including EFH for bluefin tuna larvae areas outside the Gulf of Mexico, stating that the designation of EFH cannot be justified based on current scientific knowledge. Specifically, commenters had concerns about limited sample sizes in space and time across the Slope Sea. As discussed in Comment 24 below, commenters asked that NMFS encourage additional research on the Slope Sea.

Response: During preparation of Draft Amendment 10, NMFS identified relevant research by Richardson *et al.* (2016) that included 67 data points where larval bluefin tuna were collected in the Slope Sea. Those data points were used as information input for the model. Despite the small sample size associated with Richardson *et al.* 2016, the number and distribution of data points were sufficient to meet or exceed

model thresholds for inclusion in the 95 percent volume contour. Since model results included the Slope Sea areas as part of the EFH for the bluefin tuna Spawning, Eggs, and Larval life stage, NMFS is retaining the Slope Sea area as EFH but is also encouraging additional research on these habitats (see Chapter 7 of the EA) and Comment 24 below.

Comment 7: Several commenters expressed concerns about management implications of identifying Spawning, Eggs, and Larval EFH in areas outside of the Gulf of Mexico given that current ICCAT management recommendations stipulate that the United States should not permit directed fishing on bluefin tuna in spawning areas.

Response: The relative importance of the Slope Sea bluefin tuna spawning, eggs and larval EFH to the stock is unclear at this time, however the EFH model results included the Slope Sea as part of the EFH for the bluefin tuna Spawning, Eggs, and Larval life stage because the distribution of data points met the model's threshold for inclusion in the 95 percent volume contour. ICCAT's Standing Committee on Research and Statistics (SCRS) has noted that hypotheses concerning the Slope Sea's importance as a spawning area still need to be tested (ICCAT 2016,

http://iccat.int/Documents/Meetings/Docs/2016_BFT_DATA_PREP_ENG.pdf). Furthermore, there are a number of concerns about the conclusions drawn by the Richardson *et al.* (2016) paper concerning sample size, larval data corrections, variance in data, and conclusions about early maturation (*e.g.*, Walter *et al.* 2016). The SCRS has recommended additional research be conducted to address these concerns and, at this time, the Slope Sea has not been recognized by ICCAT as western Atlantic spawning grounds. As additional information on the relative importance of the Slope Sea and if recognition as spawning grounds becomes available, NMFS will consider that information in developing or advocating for appropriate domestic and international measures.

Comment 8: In concert with accepting Preferred Alternative 3b (Expand HAPC eastward), NMFS should, at a minimum, expand adult bluefin EFH to include the entire HAPC boundary.

Response: Model results did not include the entire Gulf of Mexico into the EFH boundaries of adult bluefin tuna. Expansion of adult bluefin EFH eastward in the Gulf of Mexico to encompass all areas of the bluefin spawning, eggs, and larval life stage HAPC, would add only an additional 25

locations (+ ~2 percent of data points in the Gulf of Mexico). PSAT tagging data suggest that adult bluefin tuna migrate through this area, but do not utilize it as heavily as other areas of the central and western Gulf of Mexico (e.g., Wilson *et al.* 2015; see Figure 6.1, Section 6.2.3 of the Amendment 10 EA, see **ADDRESSES** above for instructions on how to view/locate the Final EA). As previously mentioned, the intent of EFH is not to delineate all areas where the species is known to occur, but rather the areas that are necessary for spawning, breeding, feeding, or growth to maturity. Therefore, NMFS has not modified the EFH designation for adult bluefin EFH to include the entire eastern GOM.

Comment 9: NMFS should incorporate the migratory corridor to the Gulf of Mexico as adult EFH, rather than stopping abruptly off the coast of North Carolina, most importantly including the waters around the Charleston Bump where tagging studies have shown adult bluefin feed (Wilson *et al.* 2015).

Response: Examination of PSAT tagging data (see Figure 6.1, Section 6.2.3) implies that tagged bluefin tuna may heavily use pelagic habitats ranging from coastal North

Carolina to areas north and east of the Bahamas. Data available for EFH analyses also indicate that pelagic habitats of the Blake Plateau are necessary habitat for adult Bluefin tuna. Therefore, based on further review of available data, NMFS adjusted the boundaries of adult bluefin EFH to include some of the areas recommended by the commenter. However, it is important to note that EFH designations are designed to focus attention on those habitats necessary for feeding, breeding, spawning, or growth to maturity. Migration routes, while important in their own right, are not within the scope of EFH as defined under NMFS' regulations. .

4. Bluefin Tuna HAPC Alternative

Comment 10: NMFS should accept Preferred Alternative 3b to expand the bluefin tuna HAPC in the Gulf of Mexico, as it meets all four considerations for a HAPC pursuant to § 600.815(a)(8).

Response: NMFS agrees that Preferred Alternative 3b is warranted based on the application of the HAPC criteria to the current body of scientific literature. Therefore, NMFS has expanded the current HAPC for the bluefin tuna Spawning, Eggs, and Larval life stage as provided under this alternative.

Comment 11: NMFS should designate or include the Slope Sea, newly discovered bluefin tuna spawning habitat, as a HAPC.

Response: A HAPC designation for a particular habitat must be based on one of four criteria: the importance of the ecological function provided by the habitat; the extent of sensitivity to human induced environmental degradation; whether, and to what extent, development activities are or will be stressing the habitat type; and the rarity of the habitat type. Whether the Slope Sea satisfies these criteria for bluefin tuna is unknown and research to better understand the role of this area as a spawning ground and other habitats for the species continue. Given the limited sample size to date, it is difficult to determine the importance of the ecological function provided by the Slope Sea for the western Atlantic bluefin stock. Additional sampling and research are also needed in order to effectively evaluate all HAPC criteria. The number of data points are fairly small and are limited temporally; therefore, it is difficult to delineate boundaries for an effective HAPC at this time.

5. Shark EFH Boundary Designations

Comment 12: Dusky sharks do not occur in New England waters. NMFS should establish a north/south demarcation line off New England where appropriate measures to reduce dusky shark mortality and protect dusky shark EFH could be implemented in areas south of the demarcation line. Eighteen copies of a form letter suggested that dusky shark EFH should be moved to waters south of New England and/or Montauk, NY. Other commenters supported designation south of an area known as "The Dump" (approximately 75 km east and slightly south of Montauk), or designation south of a line extending eastward from Shinnecock, NY (40°50'25" N latitude).

Response: Most of the data points collected for the EFH modeling exercise were located south of the Gulf of Maine, and therefore NMFS agrees it was not appropriate to include Gulf of Maine habitats in the proposed updates to EFH boundaries that were included in Draft Amendment 10. The available data and historical information from the scientific literature indicate that dusky sharks do occur in southern New England waters. The dusky shark EFH boundaries included in Draft Amendment 10, and the data used in the EFH models considered in Draft Amendment 10, reflect data points that are located offshore of southern New England (*i.e.*, south of

the southern coast of Long Island, Nantucket, and Martha's Vineyard) and along the southern edge of Georges Bank and the continental shelf. However, the proposed EFH boundaries in Draft Amendment 10 for dusky sharks also included some inshore areas in Narragansett Bay, near coastal Rhode Island, and areas adjacent to southeastern Massachusetts. In consideration of public comments received and review of life history information and distribution data on dusky sharks, NMFS determined that minor adjustments to EFH boundary designations to remove some nearshore coastal areas of southern New England were appropriate. For example, model output published in Draft Amendment 10 as EFH for dusky sharks included Narragansett Bay and parts of Buzzards Bay, however, the salinity of these areas is generally considered to be too low for dusky sharks (C. McCandless, pers. comm, NOAA NEFSC). Parts of Vineyard Sound, Rhode Island Sound, Block Island Sound, and Nantucket Sound were also included, likely as a result of their proximity to a larger cluster of data points located further south and offshore. Generally, dusky sharks are collected in scientific surveys further offshore (C. McCandless, pers. comm, NOAA NEFSC). Therefore, in response to public comment and based on further review of

the best available biological information, the EFH boundary designations for dusky shark have been revised to exclude these coastal areas.

Commenters also advocated for the use of a north/south demarcation line to be used for management measures that would reduce dusky shark mortality and to implement EFH. Under the current modeling method, EFH boundaries are based on the distribution and availability of point data, which provide empirical evidence that the habitat is important for feeding, breeding, spawning or growth to maturity. While landmarks or features can be used as representations to describe the extent of current EFH, they must take into account the specific locations of a species' habitat. Available data and the models developed using the current EFH delineation methodology suggested that some areas north and east of Montauk and Shinnecock NY or "the Dump" should be included within the EFH Boundaries. NMFS has described these locations within the EA.

Comment 13: NMFS should adjust its EFH boundaries to encompass highly suitable habitats for great hammerhead and tiger sharks as predicted from habitat suitability modeling. The updates to EFH boundaries proposed by NMFS in Draft

Amendment 10 are consistent with habitat suitability modeling for bull sharks.

Response: NMFS compared the areas of high habitat suitability to data available for EFH analyses and found that, in general, the adjustment of EFH based on habitat suitability models is inconsistent with the approach used by NMFS in Amendment 10 because certain areas that were deemed highly suitable by the commenter contained little to no empirical point data. Rather the identification of highly suitable habitat was based on the confluence of certain environmental characteristics that was predicted to create a more favorable habitat for that species. The intent of EFH is not to delineate all areas where the species is known to occur, but rather areas that are necessary to a species spawning, breeding, feeding, and growth to maturity. The current methodology assumes a relationship between the presence and density of points and the presence of EFH, and does not at this time incorporate a predictive aspect based on environmental variables. NMFS may explore alternative models and approaches for the next revision of EFH and, at that time, would evaluate the feasibility of incorporating habitat suitability modeling approaches (such as those put

forward by this commenter) into the delineation of EFH, if appropriate.

Comment 14: Maps and data pertaining to drumline surveys conducted between 2008-2015 by the University of Miami Shark Research and Conservation Lab suggest that areas with high catch rates in northern Biscayne Bay (between Elliot Key and Key Biscayne) should have been included in updates to EFH for blacktip sharks. NMFS should expand the EFH proposed in Draft Amendment 10 to include these areas. Areas with highest nurse, lemon, and sandbar shark CPUE are already contained within the proposed updates to EFH boundaries. NMFS should finalize the EFH boundary adjustments included in Draft Amendment 10 for these species.

Response: NMFS agrees that areas identified for blacktip, nurse, lemon, and sandbar shark EFH off South Florida are necessary habitats for these species, and it is therefore appropriate to include these areas in the EFH boundaries that would be finalized under Amendment 10. Blacktip sharks are managed regionally, with a demarcation line separating the Gulf of Mexico and Atlantic shark stocks at 25° 20.4' N latitude. In response to public comment and in consultation with the NEFSC and SEFSC, NMFS determined that

adjustments to the EFH boundaries for the Atlantic stock of blacktip sharks were appropriate and, in Final Amendment 10, extended the southern extent of juvenile and adult EFH boundaries southward along the Florida east coast to 25° 20.4' N latitude (which includes northern Biscayne Bay). Similarly, NMFS determined that the Gulf of Mexico stock boundary needed to be moved south along the Florida coast to terminate at the 25° 20.4' N latitude stock demarcation line in order to be consistent with the management extent for this stock (it previously extended north of this line).

Comment 15: NMFS should adjust EFH boundaries to include portions of Pamlico Sound, Core Sound, Back Sound, and other inshore coastal waters for juvenile and adult blacktip sharks, neonate/YOY and juvenile bull sharks, neonate/YOY and juvenile sandbar sharks, juvenile and adult blacknose sharks, neonate/YOY and adult Atlantic sharpnose sharks, and all life stages of smooth dogfish based on data from the annual North Carolina Division of Marine Fisheries (NC DMF) gillnet and longline survey and from research on delineation of coastal shark habitat within coastal North Carolina waters using acoustic telemetry, fishery-independent surveys, and local ecological knowledge (Bangley 2016).

Response: The information and data referenced in this comment, NC DMF gillnet and longline survey data and data from Bangley 2016, provided NMFS an opportunity to evaluate Atlantic HMS nursery habitat utilization in inshore and coastal North Carolina waters. As noted in Heupel *et al.* (2007), *"the use of the term 'shark nursery area' by a wide array of scientists, resource managers and conservationists appears to be inconsistent and lacks proper scientific analysis and justification. In some cases regions are labeled shark nursery areas simply because of the presence of a few juvenile sharks...[which] threatens to undermine the importance of protecting EFH by potentially identifying all coastal waters as shark nursery areas."* Due to inconsistent use of the term "nursery area" across the scientific community and concerns identified in Heupel *et al.* 2007), NMFS now prefers to apply the definitions laid out in Heupel *et al.* 2007 to identify habitats in which: 1) sharks are more commonly encountered in these areas versus other areas; 2) sharks remain or return to these areas for extended periods of time (*i.e.*, site fidelity that is greater than mean fidelity to all sites across years); and 3) the habitat is repeatedly used across all years, whereas others are not. The annual

mean number of neonate/YOY bull, sandbar, and blacktip sharks was small (e.g., approximately 5 bull and sandbar sharks per year, 9 blacktip sharks per year) and not consistent from year to year. Additionally, the survey with the longest timespan, NC DMF, had no supporting data for these species in Back and Core Sounds.

Although some acoustic data are available (n = 1 blacktip and 3 blacknose sharks), a bigger sample size would be needed to establish residency patterns of individuals and demonstrate site fidelity through time for these species in inshore North Carolina waters. The NC DMF dataset also contained only one blacknose shark, and therefore does not provide a scientifically sufficient means to analyze habitat utilization and potential EFH. NMFS had very few data points for juvenile and adult blacktip sharks (n = 23 out of 6,383) and adult blacknose sharks (n = 2) in Pamlico, Core, and Back Sound.

A larger number of smoothhound and Atlantic sharpnose shark records were noted in areas of Pamlico Sound closer to the inlets of the Outer Banks, and the model results supported keeping EFH in these areas as proposed. However, the NC DMF dataset did not include any Atlantic sharpnose or

smoothhound shark data points for Core Sound or Back Sound, and the number of data points from the Bangley (2016) dataset in these locations were also small (n = 33 Atlantic sharpnose sharks and 10 smooth dogfish) so these are excluded for these species and life stages. Many of the habitats identified near inlets as potentially important may reflect a temporary condition that is tolerable to these animals as they follow schools of baitfish to feed; however, these conditions are temporary as the tides change. Bangley (2016) analyzes data with respect to distance to inlets and salinity, however, it does not consider tidal influence on the creation of temporary habitat through the presence of prey schools responding to tidal fluctuations. Therefore, NMFS encourages additional research to further evaluate these areas as nursery habitat per the definitions outlined in Heupel *et al.* 2007 (see Section 7.1.6 of the Final Environmental Assessment, which discusses HMS Research Needs), but has not designated Pamlico, Core, and Back Sounds as EFH for blacktip, sandbar, and bull sharks; or Core and Back Sounds as EFH for Atlantic sharpnose sharks and smooth dogfish. NMFS may evaluate inshore areas of coastal North

Carolina for inclusion in these species' EFH boundaries in the future if more data become available.

Comment 16: Neonate/YOY and juvenile sandbar sharks are among the most common coastal sharks captured in NC DMF gillnet and longline surveys conducted in the spring and fall. NMFS should adjust EFH boundaries for sandbar shark to include portions of Pamlico Sound based on a dissertation (Bangley 2016) that suggested coastal North Carolina habitats, including Pamlico Sound, may be primary and secondary nursery habitats for multiple shark species, including sandbar shark.

Response: Using NC DMF gillnet and longline survey data, and the data presented in Bangley (2016), NMFS assessed whether the information provided by the commenter supported inclusion of these habitats into neonate/YOY EFH boundaries as nursery areas which are necessary for feeding and growth to maturity. Due to inconsistent use of the term "nursery area" across the scientific community and the contention of Heupel *et al.* (2007) that "*the occurrence of juvenile sharks in an area is insufficient evidence to proclaim it a nursery*", NMFS now prefers to apply the definitions laid out in Heupel *et al* 2007 to identify habitats in which 1) sharks

are more commonly encountered in these areas versus other areas; 2) sharks remain or return to these areas for extended periods of time (*i.e.*, site fidelity that is greater than mean fidelity to all sites across years); and 3) the habitat is repeatedly used across all years, whereas others are not. NC DMF data indicate that, while these species are caught consistently between years in Pamlico Sound, the numbers of data points tend to be low compared to areas seaward of the Outer Banks. Additional research is needed to indicate an elevated degree of dependency, site fidelity, and utilization of these habitats compared to nearshore habitats that are seaward of the Outer Banks before they should be included within EFH boundaries per the rationale that they are "nursery areas".

6. Sandbar HAPC Alternative

Comment 17: NMFS should implement Alternative 4a (No Action Alternative) in concert with recommendations for Alternative 2 (see comments 15 and 16 above), which would update existing EFH designations and include an expansion of sandbar neonate/YOY and juvenile EFH into estuarine waters of North Carolina to protect nursery habitats.

Response: As discussed in Comments 15 and 16, there was a small number of data points available on neonate/YOY and juvenile sandbar sharks from the datasets and information referenced in this public comment (NC DMF inshore gillnet and trawl data, and Bangley 2016). NOAA scientists from the SEFSC and NEFSC recommended that Pamlico Sound not be included in neonate/YOY EFH or that a HAPC for this life stage be retained in inshore North Carolina waters because insufficient data was available to compare the spatial and temporal utilization of these habitats with adjacent habitats, which are critical aspects of the nursery area definition outlined in Heupel *et al.* 2007. Therefore, updates to EFH finalized in this Amendment do not include inshore coastal waters of North Carolina (*i.e.*, Pamlico Sound). The commenter recommends accepting the No Action Alternative, which would retain HAPC boundaries in Pamlico Sound. Since a HAPC must be nested within updated EFH, and the updated EFH for sandbar shark does not include Pamlico Sound, it would be inconsistent with NMFS' regulations that implement the EFH provisions of the Magnuson-Stevens Act to retain the current boundaries of the Sandbar HAPC. NMFS will

continue to evaluate inshore areas of Pamlico Sound for EFH or HAPC inclusion as more data becomes available.

7. Lemon Shark HAPC Alternative

Comment 18: NMFS received three comments (including one from the Florida Fish and Wildlife Conservation Commission) in support of Preferred Alternative 5b, the proposed lemon shark HAPC that spans from Cape Canaveral to Jupiter Inlet. Commenters indicated that the HAPC is needed and well placed, and could provide additional protection for Southeastern Florida lemon shark aggregations. Other commenters indicate that this alternative is most appropriate based on available tagging and genetic research that identifies the importance of aggregation sites and migration pathways contained within the proposed HAPC.

Response: NMFS agrees that the proposed HAPC is the most appropriate alternative given independent research conducted by multiple institutions that confirm the areas are rare aggregation sites of unique importance (*i.e.*, thermal refugia, nursery grounds for juveniles, resting/feeding grounds for adults) for lemon shark populations off the southeastern United States. Tagging and genetic studies also support the inclusion of habitats in between the two

aggregation sites into the HAPC. These areas are adjacent to a region with extremely high population density, and are thus subject to potential environmental degradation and development activities.

Comment 19: NMFS should not create a HAPC for lemon sharks. NMFS should apply the HAPC criteria strictly for this area, and not designate a HAPC as a response to pressure the agency has received to curtail fishing activity in the area.

Response: As part of EFH designations for lemon sharks, NMFS considered whether those areas should include HAPCs based on the criteria for HAPC specification under 600.815(a): the importance of the ecological function provided by the habitat, the extent that the habitat is sensitive to human induced environmental degradation, the extent that development activities are or could be stressing the habitat type, and the rarity of the habitat type. A HAPC was included in the Final Amendment based on these analyses, as triggered by the identification of scientific papers (e.g., Reyier et al. 2012; Kessel et al. 2014, Reyier et al. 2014) that indicated there was scientific evidence that habitats and areas had an important ecological function, were adjacent to highly populated areas and therefore susceptible

to human use or degradation, and were rare aggregation sites for this population of lemon sharks.

Comment 20: One commenter expressed concern that a HAPC designation for lemon sharks would open the door for new regulations to be implemented in the area.

Response: The purpose of identifying HAPCs is to focus conservation efforts on localized areas within EFH that are vulnerable to degradation or are especially important ecologically for managed fish. HAPCs can also be used to target areas for area-based research. HAPCs are not required to have any specific management measures. However, such measures may need to be considered to achieve the stated goals and objectives of the HAPC. Public comment reflected concern for the status of populations of lemon sharks off Southwest Florida. Identification of a HAPC, or variations in abundance or even a change in stock status of a species for which a HAPC is identified does not, by itself, trigger an EFH rulemaking. Rather, an EFH rulemaking is triggered by a verifiable adverse effect on habitat from a fishing or non-fishing activity. The EFH provisions of the Magnuson-Stevens Act specify that FMPs must minimize to the extent practicable adverse effects of fishing on EFH, and that Councils (and

NMFS) must act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature (600.815(a)(2)(ii)). If sufficient evidence became available to suggest that fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature, NMFS would provide notification to the public of any regulations associated with EFH or the HAPCs in a future rulemaking.

8. Sand Tiger HAPC Alternative

Comment 21: NMFS should implement Preferred Alternative 6b to update EFH, as Delaware Bay and the PKD bay system have been found to be important habitats for sand tiger sharks.

Response: Data collected by the NEFSC via the Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) survey and scientific research published by Haulsee *et al.* (2014 and 2016), Kilfoil *et al.* (2014), Kneebone *et al.* (2012 and 2014) suggest that the habitats meet several HAPC criteria (e.g., ecological function provided by the habitat - discrete and relatively rare nursery areas and adult aggregation sites, published concerns

about development and environmental degradation). NMFS therefore agrees that it is appropriate to establish HAPCs in Delaware Bay and the PKD bay system.

Comment 22: NMFS should consider a HAPC designation in the western end of New York's Great South Bay since it has been discovered to be an important nursery ground for sand tiger sharks. Tagging studies show strong juvenile interannual site fidelity, that the area is only used by juveniles, and the area is located in a heavily populated area of New York that is susceptible to human induced habitat degradation.

Response: NMFS was unable to obtain data associated with a potential nursery in Great South Bay, NY. One commenter, who was not a data author, provided a point of contact associated with the New York Aquarium that have initiated research on sand tiger sharks in Great South Bay and several newspaper and gray literature articles. The data author submitted a comment with recommendations, but did not provide data associated with the comment. NMFS staff attempted to communicate with the data author multiple times by phone and email between October 2016 and January 2017, however the data author/commenter ultimately did not provide information or

data to NMFS that would allow NMFS to further evaluate the assertion that Great South Bay habitat met the HAPC criteria. Therefore, NMFS has not delineated a HAPC for sand tiger sharks in this area at this time.

9. Other Comments

Comment 23: There is a white shark nursery off Long Island. NMFS should protect young white sharks in this area.

Response: In Draft Amendment 10, NMFS considered a potential HAPC in the northern Mid-Atlantic and off southern New England for neonate/YOY and juvenile white sharks. In particular, Curtis *et al.* (2014) noted that a large number of YOY shark observations occurred between Great Bay, NJ and Shinnecock Inlet, NY. Depth and temperature associations were provided in this paper for YOY and juveniles; however, this report alone was not enough to support any one HAPC criterion. For this final amendment, NMFS examined additional data and literature that might support HAPC designation; however, the findings were insufficient to identify a discrete area that meets the criteria for a HAPC. The area identified by the commenter is already included as part of the EFH for neonate/YOY white sharks; therefore,

impacts on EFH would be considered as part of Habitat Consultations in the future.

10. Research and Restoration

Comment 24: Additional research is needed to evaluate the Slope Sea as a potential bluefin tuna spawning site, the parentage of bluefin tuna larvae on the Slope Sea, and the relative magnitude of spawning in this area compared to other known spawning grounds.

Response: NMFS has included these as high priority items in the Research Needs chapter of Final Amendment 10. Additionally, in June of 2017, the Northeast Fisheries Science Center sponsored a cruise on NOAA vessel *Gordon Gunter* to conduct research on Slope Sea larval fish populations (specifically, bluefin tuna).

Comment 25: Ongoing monitoring is prudent to ensure that there is no change in the distribution of dusky sharks or other species due to climatic shift.

Response: In 2014, NMFS published the Atlantic HMS Management-Based Research Needs and Priorities document. The document contains a list of near- and long-term research needs and priorities that can be used by individuals and groups interested in Atlantic HMS to identify key research

needs, improve management, reduce duplication, prioritize limited funding, and form a potential basis for future funding.

The priorities range from biological/ecological needs to socioeconomic needs and the document can be found at:

http://www.nmfs.noaa.gov/sfa/hms/documents/hms_research_priorities_2014.pdf. The Research Needs and Priorities document, along with feedback gathered on the Final Atlantic HMS EFH 5-Year Review and Draft Amendment 10 from the public and the scientific research community was used to develop a list of research priorities that would support future HMS EFH designation and protection in Chapter 7 of the Amendment 10 Final EA. These research priorities are further characterized as high, medium, or low priority depending upon the needs identified by the managers. High priority items are generally those that are needed to address near-term stock assessment or management needs. Medium priority items are generally those that address longer-term needs, while low priority needs would provide for more effective HMS management, despite lacking an immediate need. NMFS has listed as a medium priority for all Atlantic HMS species "[examination of] the influence of climate change on range,

migration, nursery/pupping grounds, and prey species for Atlantic HMS in general” in Chapter 7 (which itemizes Research Needs) because EFH as a management tool is not useful if the EFH boundaries do not account for shifts in the distribution of managed species.

Comment 26: NMFS should conduct focused research or provide funding to evaluate impacts to Atlantic HMS EFH in the western Gulf of Mexico (specifically, Flower Garden Banks National Marine Sanctuary) and for restoration.

Response: Funding to evaluate EFH impacts to degraded habitats and for habitat restoration is beyond the scope of this Amendment. NOAA staff from the Flower Garden Banks National Marine Sanctuary conduct sanctuary implemented and sanctuary facilitated ecological and biological research, including research focused on habitat. It is beyond the scope of this amendment for the Atlantic HMS Management Division to directly conduct focused research, or for the Atlantic HMS Management Division to direct the Sanctuary to conduct focused research, on Atlantic HMS EFH within Flower Garden Banks National Marine Sanctuary. Interested persons should visit the Flower Garden Banks National Marine Sanctuary

webpage for more information on current research programs:

<https://flowergarden.noaa.gov/science/research.html>

Authority: 16 U.S.C. 971 *et seq.*, and 1801 *et seq.*

Dated: September 1, 2017.

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