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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 902

50 CFR Part 635

[Docket No. 130417378-7331-02]

RIN 0648-BD22

Atlantic Highly Migratory Species; Atlantic Shark Management Measures; Final Amendment 5b

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

ACTION: Final rule.

SUMMARY: NMFS is amending the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) based on the results of the 2016 stock assessment update for Atlantic dusky sharks. Based on this assessment, NMFS determined that the dusky shark stock remains overfished and is experiencing overfishing. Consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), NMFS is implementing management measures that will reduce fishing mortality on dusky sharks to end overfishing and rebuild the dusky shark population consistent with legal requirements. The final measures could affect HMS-permitted commercial and recreational fishermen who harvest sharks or whose fishing vessels interact with sharks in the Atlantic Ocean, including the Gulf of Mexico and Caribbean Sea.

DATES: This final rule is effective on *[insert date 60 days after date of publication in the*

FEDERAL REGISTER], except for the amendments to § 635.4 (b), (c), and (j); § 635.19 (d); § 635.21(d)(4), (f), and (k); § 635.22 (c); § 635.71 (d)(21), (d)(22), (d)(23), and (d)(26), which will be effective on January 1, 2018.

ADDRESSES: Copies of the Final Amendment 5b to the 2006 Consolidated HMS FMP, including the Final Environmental Impact Statement (FEIS) containing a list of references used in this document, the dusky shark stock assessments, and other documents relevant to this rule are available from the HMS Management Division Website at <http://www.nmfs.noaa.gov/sfa/hms/>.

Written comments regarding the burden-hour estimates or other aspects of the collection-of-information requirements contained in this final rule may be submitted to the HMS Management Division and by e-mail to OIRA_Submission@omb.eop.gov, or fax to (202) 395-7285.

FOR FURTHER INFORMATION CONTACT: Tobey Curtis at 978-281-9273 or Karyl Brewster-Geisz at 301-427-8503.

SUPPLEMENTARY INFORMATION:

The Atlantic shark fisheries are managed primarily under the authority of the Magnuson-Stevens Act. The authority to issue regulations under the Magnuson-Stevens Act has been delegated from the Secretary to the Assistant Administrator for Fisheries, NOAA (AA). On May 28, 1999, NMFS published in the **Federal Register** (64 FR 29090) final regulations, effective July 1, 1999, implementing the FMP for Atlantic Tunas, Swordfish, and Sharks (1999 FMP). On October 2, 2006, NMFS published in the **Federal Register** (71 FR 58058) final regulations, effective November 1, 2006, implementing the 2006 Consolidated HMS FMP, which consolidated the 1999 FMP management measures and other regulatory requirements, and details

the management measures for Atlantic HMS fisheries, including the Atlantic shark fisheries. The 2006 Consolidated HMS FMP and its amendments are implemented by regulations at 50 CFR part 635.

Background

A brief summary of the background of this final action is provided below. Complete details of what was proposed and the alternatives considered are described in Final Environmental Impact Statement (FEIS) for Amendment 5b to the 2006 Consolidated HMS FMP and the proposed rule for Amendment 5b (81 FR 71672, October 18, 2016). Those documents are referenced in this preamble and their full description of management and conservation measures considered are not repeated here. Additional information regarding Atlantic HMS management can be found in the FEIS for Amendment 5b to the 2006 Consolidated HMS FMP, the 2006 Consolidated HMS FMP and its amendments, the annual HMS Stock Assessment and Fishery Evaluation (SAFE) Reports, and online at <http://www.nmfs.noaa.gov/sfa/hms/>. The comments received on Draft Amendment 5b and the proposed rule and our responses to those comments are summarized below in the section labeled “Response to Comments.”

On October 7, 2011 (76 FR 62331), NMFS made the determination that dusky sharks continued to be overfished and were experiencing overfishing. Initially, NMFS proposed to implement management measures through Amendment 5 to the 2006 Atlantic Consolidated HMS FMP, however, NMFS received substantial public comment disputing the basis for the proposed Amendment 5 dusky shark measures and suggesting significantly different measures be analyzed within the range of alternatives. Thus, NMFS decided further analysis was necessary and that dusky shark measures would be considered in a separate FMP amendment, EIS, and proposed rule, labeled “Amendment 5b.”

NMFS prepared a Predraft for Amendment 5b in March 2014 that considered the feedback received on Draft Amendment 5. NMFS solicited additional public input and consulted with its Advisory Panel on the Predraft at the Spring 2014 Advisory Panel meeting. In response to two petitions from environmental groups regarding listing dusky sharks under the Endangered Species Act (ESA), NMFS simultaneously was conducting an ESA Status Review for the Northwest Atlantic population of dusky sharks which was completed in October 2014. That status review concluded that, based on the most recent stock assessment as well as abundance projections, updated analyses, and the potential threats and risks to population extinction, the dusky shark population in the Northwest Atlantic and Gulf of Mexico has a low risk of extinction currently and in the foreseeable future, and relative abundance generally appeared to be increasing across the examined time series. On December 16, 2014, NMFS announced a 12-month finding that determined that the Northwest Atlantic and Gulf of Mexico population of dusky sharks did not warrant listing under the ESA (79 FR 74954).

In light of this updated information, including indications of abundance increases, NMFS prioritized an update of the SouthEast Data, Assessment and Review (SEDAR) 21 dusky shark stock assessment using data through 2015, to be completed in summer 2016. It was determined that further action on Amendment 5b should wait until after the completion of the 2016 assessment update to ensure that it was based on the best available scientific information.

On October 27, 2015, the environmental advocacy organization Oceana filed a complaint against NMFS in Federal district court alleging violations of the Magnuson-Stevens Act and Administrative Procedure Act with respect to the timing of NMFS's action to rebuild and end overfishing of dusky sharks. A settlement agreement was reached in *Oceana v. Pritzker* (Case No. 1:15-cv-01824-CRC) (D.D.C.), between NMFS and the Plaintiffs on May 18, 2016,

regarding the timing of the pending agency action. This settlement acknowledged that NMFS was in the process of developing an action to address overfishing and rebuild dusky sharks and that an assessment update was ongoing and stipulated that, based upon the results of the assessment update, NMFS would submit a proposed rule to the **Federal Register** no later than October 14, 2016, and a final rule by March 31, 2017.

In August 2016, the update to the SEDAR 21 dusky shark stock assessment was completed, and on October 4, 2016 (81 FR 69043), NMFS made the stock status determination that dusky sharks are still overfished and still experiencing overfishing, although the level of overfishing is not high. Based on the 2016 assessment update, as well as the rationale summarized below and fully described in the preamble of the Proposed Rule (81 FR 71672, October 18, 2016) and in Section 1.2 of the Amendment 5b FEIS (see **ADDRESSES**), NMFS determined that it needs to reduce dusky shark fishing mortality by approximately 35 percent relative to 2015 levels to rebuild the stock by the year 2107. According to the outcomes of five model runs, Spawning Stock Fecundity (SSF) relative to SSF_{MSY} (proxy biomass target) ranged from 0.41 to 0.64 (i.e., overfished) (median = 0.53). The fishing mortality rate (F) in 2015 relative to F_{MSY} was estimated to be 1.08-2.92 (median = 1.18) (values >1 indicate overfishing). The updated projections estimated that the target rebuilding years range from 2084-2204, with a median of 2107. In order to achieve rebuilding by 2107 with a 50% probability, the final models projected that F on the stock would have to be reduced 24-80% (median = 35%) from 2015 levels. While NMFS typically uses a 70-percent probability of rebuilding by the deadline for Atlantic highly migratory shark species, the 2016 update has a higher level of uncertainty than other shark assessments and presents a more pessimistic view of stock status than was expected based on review of all available information (as detailed in the proposed rule and Section 1.2 of

the FEIS). Thus, for the purposes of this Amendment, management measures were developed that would achieve the mortality reductions associated with the median assessment model run and a 50-percent probability of rebuilding by the deadline (i.e., 35-percent mortality reduction). A detailed discussion of the stock assessment can be found in the Amendment 5b FEIS (see **ADDRESSES**) and the final SEDAR 21 stock assessment update report, available on the SEDAR website (<http://sedarweb.org/sedar-21>).

The proposed rule for Amendment 5b to the 2006 Consolidated HMS FMP and the Notice of Availability of the DEIS for Amendment 5b published in the **Federal Register** on October 18, 2016 (81 FR 71672) and October 21, 2016 (81 FR 72803), respectively.

Draft Amendment 5b included management measures that would reduce dusky shark mortality in the recreational shark, commercial pelagic longline, bottom longline, and shark gillnet fisheries. Draft Amendment 5b also clarified annual catch limits (ACLs) and accountability measures (AMs) for the prohibited shark complex, including dusky sharks. Detailed descriptions of the proposed management measures and ACL and AM clarifications are available in the Amendment 5b DEIS and proposed rule. The public comment period ended on December 22, 2016.

This final rule implements the measures preferred and analyzed in the FEIS for Amendment 5b to the 2006 Consolidated HMS FMP in order to end overfishing and rebuild dusky sharks. The FEIS analyzed the direct, indirect, and cumulative impacts on the quality of the human environment as a result of the preferred management measures. The FEIS, including the preferred management measures, was made available on February 24, 2017 (82 FR 11574). On March 28, 2017, the Assistant Administrator for NOAA signed a Record of Decision (ROD) adopting these measures as Final Amendment 5b to the 2006 Consolidated HMS FMP. A copy

of the FEIS, including Final Amendment 5b to the 2006 Consolidated HMS FMP, is available from the HMS Management Division (see **ADDRESSES**). In brief, the final management measures implemented in this rule are: shark endorsement and circle hook requirements in the recreational Atlantic shark fisheries; shark release protocols in the pelagic longline fishery; dusky shark identification and safe handling training in the HMS pelagic longline, bottom longline, and shark gillnet fisheries; outreach and fleet communication protocol in the HMS pelagic longline, bottom longline, and shark gillnet fisheries; and, a circle hook requirement in the directed shark bottom longline fishery. Additionally, Amendment 5b clarifies ACLs and AMs for the prohibited shark complex, including dusky sharks. As described in the Responses to Comments below, NMFS made several changes to the preferred alternatives between the proposed and final rule, based in part on public comments. The specific changes are described below in the section titled “Changes from the Proposed Rule.”

Response to Comments

We received a total of 76 individual written comments on the proposed rule from fishermen, states, and other interested parties during the public comment period, including one comment from EarthJustice that included signatures from 19,716 individuals and another comment from Oceana that included signatures from 13,144 individuals. We also received comments from fishermen, states, and other interested parties during six public hearings, five regional fishery management council meetings, one Atlantic States Marine Fisheries Commission meeting, and one HMS Advisory Panel meeting. All written comments can be found at <http://www.regulations.gov/>.

A. Miscellaneous comments

Comment 1: NMFS received a wide range of comments expressing general support for the proposed conservation and management measures. Commenters' support was based upon their concerns about the current status of the dusky shark stock and the need to end overfishing and conserve the species in combination with their understanding that the proposed measures would have minimal negative impacts on the recreational and commercial fisheries. Some commenters agreed that the measures would end overfishing and rebuild the stock within the rebuilding timeframe. Most commenters supported the establishment of a shark endorsement requirement for HMS permit holders fishing for sharks recreationally, and shark identification and regulations course for commercial permit holders (HMS pelagic longline, bottom longline, and shark gillnet) as a requirement to target, land, and retain sharks in Federal waters. Many commenters generally supported requiring the use of circle hooks in the recreational and bottom longline fisheries although there were many comments requesting modifications to the wording and implementation of the alternatives, as discussed in more detailed comment responses below. Commercial fishermen and other groups expressed general support for the commercial alternatives, including the establishment of a dusky shark avoidance and relocation protocol, requiring the use of dehookers or cutting the line within three feet of the shark to release them, and adding a shark identification section to the protected species and safe handling workshop required of commercial fishermen. The Environmental Protection Agency (EPA) rated the DEIS as "lack of objections," per its EIS rating criteria, and noted its support for the overall efforts by NMFS to further protect dusky sharks.

Response: As detailed in Chapter 4's environmental effects analyses, NMFS agrees that the Amendment 5b measures will reduce fishing mortality below the level needed to end overfishing and rebuild the dusky shark stock consistent with the SEDAR 21 dusky shark stock

assessment update and the Magnuson-Stevens Act, while minimizing effects on the commercial and recreational fisheries.

Comment 2: Some commenters stated that additional regulations to protect dusky sharks were not warranted as their retention is already prohibited. These commenters felt NMFS should instead focus on the enforcement of existing regulations prohibiting the harvest of dusky sharks, and that additional regulations on the fishery would result in reduced compliance. The State of Mississippi opposed the measures to protect dusky sharks because it felt the measures could interfere with the fisheries for other, healthy stocks of sharks.

Response: Although a prohibition on retention at times provides adequate protection for species that are experiencing overfishing, the latest dusky shark stock assessment update shows that dusky sharks are still experiencing overfishing despite their prohibited status. A detailed description of the dusky shark stock assessment update results is available in Chapter 1 of the FEIS. Because dusky sharks are still overfished and experiencing overfishing, the Magnuson-Stevens Act requires NMFS to implement management measures to stop overfishing and rebuild the stock.

Comment 3: Commenters stated that additional management measures to conserve dusky sharks should be implemented in all fisheries that interact with dusky sharks, and not just the HMS fisheries that do so. Fisheries not covered under Amendment 5b that were identified by various commenters as interacting with dusky sharks included state water recreational and commercial fisheries, the Gulf of Mexico reef fish bottom longline fishery, the South Atlantic snapper-grouper bottom longline fishery, and the South Atlantic dolphin/wahoo fishery.

Response: Based on the best scientific information available, the majority of dusky shark interactions occur in commercial and recreational HMS fisheries, as described in Section 1.2 of

the FEIS. Specifically, the available observer data for the Southeast dolphin/wahoo, reef fish, and snapper-grouper longline fisheries indicate that dusky shark bycatch is rare, averaging only a few observed mortalities per year. The commenters rely heavily on the extrapolated estimates of the first National Bycatch Report, 1st Edition Update 1 (2011), but as detailed in Chapter 1 of the FEIS and the response to Comment 13, NMFS generally does not rely on that Report for management purposes. Further, NMFS has determined that these estimates are inappropriate for use in developing conservation and management measures for this specific stock. These bycatch estimates were not accepted for use in the SEDAR 21 stock assessment and update by the data workshop working group, further highlighting their inadequacy for HMS management purposes.

Dusky shark mortality does occur in state waters. However, NMFS does not manage the state water fisheries; as described in the FEIS and Appendix II, NMFS will coordinate with the states and the Atlantic States Marine Fisheries Commission on the measures implemented by this action. If the states also adopt measures commensurate with those included in Amendment 5b, as they often do with HMS actions, it will increase the mortality reduction benefits for dusky sharks. However, the measures in Amendment 5b, building on the existing Federal conservation and management measures, are sufficient to meet the Magnuson-Stevens Act requirements in the absence of state and/or Atlantic State Marine Fisheries Commission (ASMFC) action. The conservation and management measures that are components of the rebuilding plan are still in effect and include: a continued prohibition on retention of dusky sharks (§§ 635.22(c)(4) and 635.24(a)(5)), time/area closures (§ 635.21(d)), and the prohibition of landing sandbar sharks (the historic target species for the large coastal shark fishery and responsible for a significant portion of dusky interactions) outside of a limited shark research fishery, along with significant large coastal shark (LCS) retention limit reductions in the bottom longline fishery where

interactions were commonly occurring (§§ 635.24(a)(1), (2), and (3)). The measures in Amendment 5b will build upon these existing rebuilding plan elements.

Comment 4: The EPA and some commenters expressed their concern that the proposed measures only appear to reduce mortalities as opposed to reducing interactions. They found this particularly concerning in the commercial longline fisheries where they suggest that many dusky sharks are already dead upon haulback (i.e., high at-vessel mortality). One commenter stated that sharks caught on longline gear that are still alive at haulback face significant post-release mortality. Some commenters felt NMFS should further consider alternatives that prohibit fishing during the areas/times that dusky sharks are most vulnerable to capture, reduce overall effort, or require the use of more selective fishing gear. Some commenters stated that the non-preferred alternative to implement hot spot closures is the only effective way to reduce dusky shark mortality. Some commenters advocated for the alternative that would impose a bycatch cap on the fisheries that interact with dusky sharks in hotspot areas. These commenters said that once a bycatch cap is reached, that should trigger hotspot closures in areas where dusky shark bycatch is known to be high for the corresponding fishery. Some commenters stated that the hotspot closure measures were the only alternatives that provided a quantifiable and objective reduction in dusky mortality.

Response: NMFS agrees that there is evidence that dusky sharks experience high at-vessel and post-release mortality rates in some fisheries, including the longline fisheries. That is why the approach taken in Amendment 5b to reduce dusky shark mortality relies, in part, on bycatch reduction (Alternative B6), gear modifications (Alternatives A6d, B9), safe release requirements (Alternative B3), and education and training on handling techniques (Alternatives A2, B5, B6) to reduce at-vessel and post-release mortality rates. NMFS analyzed a series of

bycatch “hotspot” time/area closures in Alternative B4, but these alternatives were not preferred because similar or greater reductions could be achieved with other measures that would have fewer negative socioeconomic impacts. Additionally, the hotspot closure analyses only quantified the mortality reductions that could be achieved within the pelagic longline fishery (only one source of mortality), not across the whole stock. NMFS analyzed alternatives that would reduce fishing effort by making the recreational shark fishery catch-and-release only (Alternative A7), limiting the number of hooks on pelagic longline sets (Alternative B2), and entirely closing the pelagic longline fishery (Alternative B8). The analyses in Chapter 4 of the FEIS support the determination that the Amendment 5b measures will achieve the necessary mortality reductions without the negative socioeconomic impacts associated with the hotspot closure and bycatch cap alternatives.

Comment 5: One commenter stated that the overarching goal of Amendment 5b should be to effectively “count, cap, and control” dusky mortality in all fisheries that interact with the species.

Response: NMFS disagrees that this general management approach would be feasible or necessary in Amendment 5b. The objectives of Amendment 5b are to end overfishing and rebuild dusky sharks, which must be achieved through reductions in mortality. A “count, cap, and control” approach is used in a number of other fisheries, and can reduce mortality in cases where appropriate bases exist to specify and monitor catch limits that are correlated with fishing mortality rates, but there are numerous other acceptable ways to reduce fishing mortality. In the case of the dusky shark, there are insufficient data to count or cap catches. Measures were taken in Amendment 2 to significantly reduce interactions with dusky sharks by, for example, severely reducing allowable catch in the bottom longline fishery for sandbar sharks (the primary source of

dusky bycatch), and the dusky shark fishery remains closed by designating the species as a prohibited shark species and setting the catch limit at zero. These measures continue to be in effect. The same commenter acknowledges this fact, stating “[i]n order to reduce bycatch, the Service must first determine how much bycatch is occurring, when, and where,” and “[t]he Fisheries Service cannot enforce bycatch caps if the amount of bycatch is unknown.” NMFS agrees with these statements, which highlight the impracticality of the proposed “count, cap, and control” management approach in the absence of the fundamentally necessary bycatch data. As described in Section 1.2 of the FEIS and in the stock assessment update, total catch data do not exist, thus the SEDAR21 assessment update used a catch-free modeling approach, and the total allowable catch (TAC) estimates provided by the 2016 stock assessment update were not recommended as valid for use in management. For the above reasons, there is no rational basis in this situation for establishing an appropriate cap for dusky shark catches in any individual fishery or across fisheries that interact with them, or to know what level of catch would effectively and appropriately constrain fishing mortality. Consequently, the amended rebuilding plan does not contain measures that would rely upon absolute catch or discard estimates, such as a quota or sector ACLs. Instead, the measures in Amendment 5b focus on reducing the rates and relative levels of mortality. The measures in this action will achieve the necessary mortality reductions through other means, including bycatch reduction, safe release requirements, gear modifications and training that reduce at-vessel and post-release mortality rates, and outreach and education to improve compliance rates and data collection, in addition to the measures adopted in the 2008 rebuilding plan. Additionally, with improved species identification training, data collection on recreational dusky shark catches should improve by reducing the occurrence of “unidentified” sharks in catch reports and surveys and increasing confidence in the reported

catch of dusky sharks. As data collection improves, catch-based assessments and management measures may become feasible in the future.

Comment 6: NMFS should establish bycatch caps between fishery sectors within the Consolidated HMS FMP, as well as between non-HMS FMPs as a “preferred alternative” in the final Amendment 5b. At a minimum, NMFS should coordinate bycatch caps among the HMS fisheries, Gulf of Mexico reef fish bottom longline fishery, and South Atlantic snapper-grouper bottom longline fishery, as well as other fisheries responsible for dusky shark bycatch and mortality.

Response: NMFS disagrees that bycatch caps are appropriate for further limiting dusky shark mortality. Under Alternatives Considered but Not Further Analyzed in Chapter 2 of the FEIS, NMFS includes a detailed explanation of why bycatch caps, while helpful for some species, are not appropriate for the current situation with the available data for dusky sharks. The response to Comment 5 also addresses scientific concerns related to establishing dusky shark bycatch caps.

Comment 7: The EPA noted that the 2014 Northwest Atlantic Dusky Shark Status Review Report identified hook time, correlated with soak time, as a significant factor in predicting at vessel dusky shark mortality. As such, the EPA recommended that NMFS consider providing more detail in the FEIS concerning the appropriateness of addressing hook soak time as a means of reducing dusky shark mortality in the longline fisheries.

Response: NMFS agrees that there is considerable scientific information indicating that shorter hook soak times on bottom longlines are correlated with reduced at-vessel and post-release mortality rates on many shark species, including dusky sharks. However, as described in Section 2.3 of the FEIS (Alternatives Considered but Not Further Analyzed), an alternative that

would limit soak time is not considered to be reasonable at this time because of safety, enforcement, and safe-handling concerns. During the public comment period of the Amendment 5b Predraft, NMFS heard comment from industry that limiting soak time could rush fishing operations, particularly on sets with high numbers of large fish. In these instances, the crew may need to rush to meet soak time restrictions, compromising safety at sea and possibly rushing through protected resource safe handling requirements. From an enforcement perspective, concerns were raised about effectively monitoring such a measure fleetwide absent high levels of observer coverage and more general concerns were noted about the enforceability of soak times.

Comment 8: NMFS received a wide range of comments regarding the need for a quantitative analysis explaining how the proposed measures would achieve the 35-percent reduction in dusky shark mortality. EPA and other commenters noted that it was difficult from the analyses in the DEIS to clearly evaluate the effectiveness of the different alternatives as contributing to the necessary mortality reduction. As such, the EPA recommended providing additional information in the FEIS to help quantify the impacts of the alternatives and facilitate comparisons of alternatives. Another commenter questioned whether the qualitative analyses of the proposed alternatives meet the standards required by NEPA. Several commenters called upon NMFS to conduct a more quantitative analysis of the proposed alternatives in the FEIS to demonstrate how they would achieve the targeted 35-percent reduction in mortality.

Response: NMFS has been responsive to these comments in the FEIS, which includes more quantitative analysis of the expected impacts of the alternatives, to the extent possible using the best available scientific information. However, as described in Chapter 4 of the FEIS, it is not possible to specifically quantify the projected effect of most of the preferred alternatives on the overall dusky shark population because total catch and population size are unknown. The

alternatives in the FEIS include more quantitative discussion than the DEIS included for the expected effects on mortality rates of individual sharks caught within the affected fisheries, but qualitative inferences are still necessary due to the lack of data. Qualitative analyses are acceptable within NEPA analyses when quantitative resources are lacking. Therefore, while it is not possible to calculate the precise mortality reduction of the alternatives, individually or cumulatively, NMFS has determined that the best available scientific information indicates that the measures in Amendment 5b will end overfishing and rebuild the dusky shark stock as required.

Comment 9: Two commenters suggested that NMFS had not fully analyzed a reasonable range of alternatives to end overfishing and rebuild the dusky shark stock consistent with NEPA requirements. These commenters stated that bycatch caps are within the reasonable range of alternatives and are one of the few measures that can objectively reduce dusky shark mortality. The commenters believe that by not analyzing bycatch caps, NMFS has not analyzed a full range of alternatives. These commenters also stated that to comply with NEPA requirements, a range of alternatives considering ACLs other than zero and additional AMs should be analyzed. Furthermore, it was stated that to comply with NEPA, a range of alternatives analyzing the impacts of using different probabilities of achieving rebuilding success (i.e., 50 percent, 70 percent, or 90 percent probability) should have been developed.

Response: The alternatives analyzed in Amendment 5b represent the reasonable range of alternatives, consistent with the purpose, need, and objectives of the rulemaking, as required by NEPA. Although some commenters have identified measures that they believe would better meet the objectives of Amendment 5b, not all of them are reasonable. Bycatch caps were not

considered a reasonable alternative, as detailed in the Alternatives Considered but Not Further Analyzed section in Chapter 2 of the FEIS. See also responses to Comments 5 and 6.

Regarding the probability of rebuilding, NMFS made a scientifically-based determination about the appropriate level of risk, given the circumstances here. As discussed in Section 1.2 of the FEIS, NMFS has explained the scientific justification for using the 50 percent probability and explained why 70 percent was not feasible due to poor data, uncertainty, and other concerns. The determination of which probability to use was not based on ecological, social, or economic impacts; rather, it was based on the stock assessment output estimates, overfishing risk tolerance, and the level of confidence in the output. A more detailed explanation of NMFS' determinations regarding the probability of rebuilding is available in the response to Comment 25.

Comment 10: One commenter stated that Amendment 5b is inconsistent with National Standard 9 because the action does not provide a means to quantify dusky bycatch.

Response: National Standard 9 of the Magnuson-Stevens Act states that “[c]onservation and management measures shall, to the extent practicable: (1) Minimize bycatch; and (2) To the extent bycatch cannot be avoided, minimize the mortality of such bycatch.” Consistent with this national standard, over the years, NMFS has implemented conservation and management measures to minimize bycatch and bycatch mortality of dusky sharks. See Chapter 1 of the FEIS. The Amendment 5b measures build upon those bycatch measures, as they are specifically designed to reduce at-vessel and post-release mortality rates of dusky sharks. In addition, the education and outreach measures will improve species identification and accurate reporting of catches of dusky sharks and other prohibited species. For an explanation of bycatch reporting methodologies for HMS fisheries, see Chapter 3 of the FEIS.

Comment 11: One commenter stated that state water fishermen are interacting with dusky sharks during certain times of the year and that those fishermen often misidentify shark species. The commenter stated that dealers that purchase the sharks typically take the fisherman's word on species identification.

Response: An important part of Amendment 5b's outreach effort to rebuild dusky sharks is working with the ASMFC and the Atlantic states to encourage them to reduce dusky shark mortality and implement measures that complement NMFS' effort within their jurisdictions. All shark dealers in Atlantic states (Maine through Florida) are required to obtain a Federal shark dealer permit, per the ASMFC Interstate FMP for Coastal Sharks, and must attend a shark identification workshop as a condition of their permit. Other members of the public, including state dealers in the Gulf of Mexico can attend these workshops and states have the option to set up their own workshops for state dealers to attend. Any Atlantic shark dealers misreporting shark species identification will continue to be referred for enforcement action as appropriate.

Comment 12: Some commenters, including the EPA, suggested that NMFS consider extending the requirement to use dehookers or to cut the leader close to the hook to recreational shark anglers as well.

Response: This final rule requires that commercial fishermen release all sharks that are not being boarded or retained by using a dehooker, or by cutting the gangion no more than three feet from the hook as safely as practicable. NMFS does not extend the same requirement to the recreational fishery. NMFS already requires recreational anglers to release sharks in a manner that maximizes the chance of survival, and many anglers do so by using dehookers or by cutting leaders close to the hook. At-vessel and post-release mortality of dusky sharks in recreational fisheries already appears to be low according to the available recreational data in the FEIS

(Section 1.2). Thus, NMFS will continue to maintain the requirement as written in the recreational fisheries without specifying the required method of release, because the requirement is already effectively implemented.

Comment 13: One commenter stated that Amendment 5b is not consistent with National Standard 2 because the action does not use the best available science. This commenter contends that, although highly uncertain, the TAC provided in the 2016 dusky shark stock assessment update is the best available science and should be used to provide a cap on fishing mortality. Furthermore, this commenter stated that the dusky shark bycatch estimates in the National Bycatch Report are the best available science and should be used, consistent with National Standard 2.

Response: Amendment 5b is consistent with National Standard 2 and uses the best available science, including the 2016 SEDAR 21 stock assessment update for dusky sharks. It also relies on scientific advice regarding the value or advisability of using certain data as the basis for management measures. While certain data were deemed not reliable enough to form the basis of management measures, the development of the conservation and management measures and impact analyses drew heavily from several up-to-date data sources, including logbooks, observer reports, fishery-independent surveys, Marine Recreational Information Program (MRIP) estimates, and recent scientific research. Results from the stock assessment update and the other data sources represent the best available science. In acceptance of the 2016 stock assessment update as the best available science, NMFS has also accepted its recommendation to *not* use the calculated TACs, as described in Section 1.2 of the FEIS and stock assessment update report. While the commenter recommended that we use “the TAC” in the stock assessment, the final 2016 stock assessment update had five different TAC estimates

ranging from 7,117 to 47,400 lb (3.2 to 21.5 mt) dressed weight (median = 27,346 lb (12.4 mt) dressed weight), and NMFS has no scientific basis to select one TAC over another, and none of them are considered acceptable for management purposes.

Because the stock assessment uses a catch-free model, it does not calculate projected levels of catch. Therefore, these estimates were not recommended for use in management according to the stock assessment documents. Specifically, the preliminary 2016 stock assessment update report stated that, “[w]e also provided an estimate of the total weight of removals associated with different reductions in total F, but caution that these are estimates only, and subject to considerable uncertainty.” Additionally, the final 2016 stock assessment update recommended that “projections based on catch-based removals should not be considered.” Therefore, NMFS accepts the recommendations of the stock assessment update, and will not use those TAC estimates as a basis for any management measures.

As detailed in Section 1.2 of the FEIS, the values estimated in the National Bycatch Report, 1st Edition Update 1 for 2006-2010, used a methodology that tended to overestimate dusky shark bycatch in these non-HMS fisheries, which was corrected in the subsequent National Bycatch Report update for 2011-2013 (Table 1.6). Specifically, because there were so few observed dusky shark interactions in the reef fish and snapper-grouper BLL fisheries (as supported by Table 1.5), the National Bycatch Report (1st Edition Update 1) initially used dusky shark catch-per-unit-effort (CPUE) from the shark BLL fishery observer program, including the shark research fishery data, and expanded that catch rate to the total effort in the BLL fisheries for reef fish and snapper-grouper. BLL sets for sharks and reef fish/snapper-grouper are different (different gear configurations, soak times, etc.) and are not directly comparable. Additionally, because sets for both sharks and reef fish/snapper-grouper can occur on the same

trip, estimates that treated these fisheries completely separately would have resulted in double counting of some sharks. The shark research fishery trips target sandbar sharks and have a comparatively high interaction frequency with dusky sharks, which resulted in artificially inflated values for dusky shark bycatch in the non-HMS BLL fisheries. Similar artificially inflated estimates were made in the vertical line and troll fisheries, where observed dusky shark interactions are near zero. Therefore, the dusky shark estimates provided in the National Bycatch Report, 1st Edition Update 1 (using 2006-2010 data) are considered invalid for use in management. The methodology used to estimate dusky shark bycatch in the National Bycatch Report, 1st Edition Update 1 was not used in the subsequent National Bycatch Report updates due to these issues. Additionally, these extrapolated catch estimates were not accepted for use in the SEDAR 21 stock assessment and update, which used catch-free models, further supporting NMFS' determination that these estimates are not acceptable for use in management.

Comment 14: The EPA submitted a comment recommending additional environmental justice information in the EIS. Specifically, the EPA recommended that NMFS include the evaluation of environmental justice populations within the geographic scope of the projects. The EPA recommended that NMFS substantiate and include in the EIS whether the proposed alternatives have any potential for disproportionate adverse impacts to minority and low-income populations. The EPA also recommended that the EIS include the approaches used to foster public participation by these populations and describe outreach conducted to all other communities that could be affected by the project, because rural communities may be among the most vulnerable to health risks associated with the project.

Response: NMFS appreciates these recommendations from the EPA and has added additional information in the environmental justice discussion in Section 9.4 of the FEIS.

Comment 15: The EPA recommended providing summaries of any studies or other scientifically-supportable information that supports the assumption that recreational and commercial shark identification training will reduce dusky shark mortality through decreased misidentification and increased understanding of regulations.

Response: The Alternative A2 ecological impacts section of Chapter 4 of the FEIS details how species identification outreach can reduce mortality of elasmobranchs. Research on other U.S. Atlantic prohibited elasmobranch species has demonstrated that focused outreach and species identification training can improve compliance rates with prohibited species regulations to over 98 percent, including reducing illegal landings by 95 percent (Curtis and Sosebee 2016). Additionally, angler education programs that train recreational fishermen in safe fishing, handling, and release techniques result in reduced post-release mortality rates (Poisson et al. 2016).

Comment 16: The EPA submitted a comment questioning the effectiveness of dusky shark species identification training, specifically with respect to Galapagos sharks. Galapagos sharks are very difficult to differentiate from dusky sharks. The EPA stated that while U.S. fishermen likely fish in areas overlapping with dusky shark distribution rather than Galapagos shark distribution, it is very difficult to tell the two species apart. The EPA contends that dusky sharks are morphologically very similar to, and genetically indistinguishable from, Galapagos sharks. Vertebral counts and subtle dorsal fin differences are characteristics used to distinguish the two species and are unlikely to be used without lethally exposing the vertebral column or comparing side-by-side specimens of the two species. The EPA stated that it is unclear how better species identification would resolve species identification difficulties.

Response: NMFS is aware of the difficulty in differentiating between dusky and Galapagos sharks and the emerging research examining genetic differences. However, both species are prohibited from retention and landings, thus, both would be released by any fishermen catching and confusing the species. Because both species are prohibited, NMFS does not see an immediate sustainability threat to dusky sharks due to misidentification between the two species.

Comment 17: The EPA submitted a comment stating that juvenile dusky sharks look very similar to juvenile sandbar, Galapagos, and silky sharks, even if adults are more readily identifiable. They were concerned that misidentification among the four species could reduce the effectiveness of efforts to reduce dusky shark mortality.

Response: NMFS acknowledges the species identification challenges with juvenile dusky sharks and similar-looking species, which has been a chronic hindrance to estimating catches and assessing the stock with catch-based methods. However, the measures in Amendment 5b will reduce mortality rates on all sharks in the affected fisheries, and improve species identification. Because all four of the species mentioned in the EPA's comment are prohibited in the recreational fishery and cannot be retained by pelagic longline fishermen, NMFS does not see an immediate sustainability threat to dusky sharks due to misidentification among these four species.

B. Annual Catch Limits (ACLs) and Accountability Measures (AMs)

Comment 18: One commenter stated that NMFS should not set the dusky shark ACL equal to zero. Instead, the commenter felt the Agency must use the best scientific information currently available to set a precautionary ACL that accounts for bycatch interactions of dusky sharks in each fishery that catches dusky sharks and propose AMs to ensure adherence to the

ACL (including the current prohibition on retaining dusky sharks). Another commenter stated that dusky sharks should not be grouped with the other prohibited sharks under the same ACL.

Response: Amendment 3 to the HMS FMP (2010) implemented a mechanism for establishing ACLs and AMs for each of the shark management groups. For sharks in the prohibited shark complex, this methodology was not applied because the fisheries were closed and landings were prohibited. Therefore, the ACL was considered to be zero, as clarified in this Amendment. Recent revisions to the NS 1 guidelines (81 FR 71858; October 18, 2016), specify that if an ACL is set equal to zero and the AM for the fishery is a closure that prohibits fishing for a stock, additional AMs are not required if only small amounts of catch (including bycatch) occur and the catch is unlikely to result in overfishing. See 50 CFR 600.310(g)(3).

Here, the ACL for the prohibited shark complex continues to be set equal to zero, and the existing AM for all of the stocks in the prohibited shark fishery is a closure that prohibits fishing for the stocks. Inclusion of a species in the prohibited stock complex means that all commercial and recreational retention is prohibited and the fishery is closed (see § 635.28(b)(1)(iv)). Thus, AMs in addition to the closure are not required if only small amounts of catch occur and the catch is unlikely to result in overfishing. There is no information suggesting that overfishing is occurring on species in the prohibited shark complex, except for dusky sharks, and the Amendment 5b rulemaking is undertaking AMs to end that overfishing.

NMFS notes that there would be policy and scientific/data concerns if we were to specify an ACL other than zero for the prohibited shark complex, including dusky sharks. As noted in the response to Comment 13, there was a high level of uncertainty in the 2016 assessment update, given limited data on dusky sharks, multiple data sources, and five plausible model scenarios. The update had five different TAC estimates, and these estimates were so uncertain

and wide-ranging as to be inappropriate for management use according to the SEDAR 21 stock assessment. NMFS does not have a basis for picking one model scenario over another and is concerned that setting an ACL based on the highly uncertain TAC estimates could encourage increased catch. Furthermore, allowing catch or landings, even at low levels, could send a message to fishermen that interactions are permissible at some level and could disincentivize avoidance of interactions, which is one of the goals of the measures adopted in this Amendment. Thus, dusky sharks remain in the prohibited shark complex, with an ACL set at zero. The measures adopted through Amendment 5b, in addition to the continuation of measures adopted as part of the dusky shark rebuilding plan, are AMs.

Regarding the comment that dusky sharks should be removed from the prohibited shark group and managed separately, separating dusky sharks and the other prohibited sharks under separate ACLs, each equal to zero, would not provide any meaningful advantage for any prohibited species over the approach being used. Catch and bycatch estimates, to the extent they are available, will still be tracked individually for each species and in any future assessments for prohibited sharks. Grouping all prohibited sharks under a single ACL does not preclude NMFS from considering management measures to address any sustainability concerns for any single stock, as evidenced by the actions in Amendment 5b. In summary, NMFS has determined that specifying an ACL of zero for the prohibited shark complex, which includes dusky sharks, is appropriate and consistent with the NS1 guidelines and requirements of the MSA.

Comment 19: Another commenter stated that NMFS has essentially operated under an ACL of zero since retention of dusky sharks was prohibited in 2000, has failed to track or limit bycatch of dusky sharks or enforce any limit of bycatch mortality with accountability measures, and in doing so has failed to end overfishing of the stock.

Response: NMFS disagrees. Dusky sharks have been prohibited since 2000, but ACLs were not established for HMS-managed sharks until Amendment 3 (2010). As clarified in this Amendment, the ACL for the stocks in the prohibited shark complex, including dusky sharks, is zero. The recreational and commercial fisheries for dusky sharks are closed, and the measures adopted in this amendment will ensure that only small levels of bycatch will occur and will not lead to overfishing. Contrary to the commenter's assertions, NMFS has taken significant management actions to address dusky shark overfishing since the prohibition for dusky sharks went into effect and has continuously monitored bycatch levels using all available data sources (see Section 1.2 of the FEIS). The first dusky shark stock assessment was completed in 2006. As a result of that assessment, in 2008, NMFS established a rebuilding plan for dusky sharks and implemented major changes in the shark fisheries that changed how all directed shark fishermen conduct their business (e.g., creation of the shark research fishery, severe reduction of sandbar shark quota to reduce dusky shark bycatch, reduction in the trip limit, etc.). Since that time, there have been other actions in HMS fisheries, such as the implementation of Amendment 7, that have resulted in significant changes throughout HMS fisheries, not just shark fisheries. According to the SEDAR 21 dusky shark stock assessment update, NMFS' management of dusky sharks has significantly reduced fishing mortality on dusky sharks, but not yet completely ended overfishing. Dusky sharks have experienced improvements in their stock status outlook as described in the 2016 stock assessment update and Section 1.2 of the FEIS. Overfishing has been reduced substantially (median F_{2015}/F_{MSY} ratio of five scenarios = 1.18, compared to F_{2009}/F_{MSY} = 1.59 in the previous assessment). As detailed in the ecological impacts section of Chapter 4 of the FEIS, the management measures in Amendment 5b, which are AMs, will build on the success of past measures by further reducing bycatch mortality and ending overfishing.

Additionally, NMFS has continually tracked dusky shark bycatch over time through numerous fishery-dependent monitoring programs (observers, logbooks, recreational surveys, etc.), as detailed in Section 1.2 of the FEIS.

Comment 20: One commenter stated that the National Standard 1 provision at 50 CFR 600.310(g)(3) should not apply to the dusky shark fishery. See response to Comment 18 for explanation of the provision. The commenter contends that 1) the dusky shark fishery is not closed as several fisheries that are known to interact with dusky sharks are still open; 2) overfishing is still occurring in the dusky shark fishery; and 3) bycatch is not small considering the average annual number of dusky sharks caught as bycatch (529 per year according to the DEIS) is more than double the highest estimated TAC of adult dusky sharks (which the commenter calculated would be 249 dusky sharks by dividing the estimated TAC in the assessment by a potential average dressed weight of a mature dusky shark) that would provide a 70-percent chance of rebuilding by 2107, according to the recent SEDAR 21 update. The commenter also stated that the DEIS did not specify a threshold for determining what level of bycatch is “small.”

Response: As discussed in Section 1.2 of the FEIS, the ACL/AM provisions for dusky sharks in Amendment 5b meet the conditions set forth in the NS 1 guidelines. First, the dusky shark fishery is closed, as explained in response to Comment 18. Second, measures under Amendment 5b and this rule will end overfishing for dusky sharks and ensure that the small levels of bycatch are unlikely to lead to overfishing. NMFS notes that the estimated level of overfishing for dusky sharks in the current stock assessment update is not high (median of five plausible model scenarios is F_{2015}/F_{MSY} is 1.18; values >1 indicate overfishing).

Third, for all sharks in the prohibited shark complex, only small amounts of catch (including bycatch) occur. The NS1 guidelines do not provide a definition or detailed guidance on what constitutes a “small” amount of bycatch. However, the available data show that prohibited shark species—including dusky sharks—are not commonly caught as bycatch in HMS or other fisheries. Prohibited sharks as a group have observed bycatch amounts in the 10s and 100s of individuals. By comparison, many fish stocks have observed bycatch amounts estimated in the hundreds and thousands of metric tons, and prohibited shark species collectively represent a small portion of total shark bycatch across all fisheries (U.S. National Bycatch Report, First Edition Update 2, 2016). With regard to the commenter’s TAC calculation, as detailed in the response to Comment 13, the TACs estimated in the 2016 stock assessment update are not considered acceptable for management. Thus, direct comparisons of the observed mortalities summarized in Section 1.2 of the FEIS against the TACs estimated in the stock assessment update are not appropriate.

In addition to requiring that the bycatch be “small,” the NS1 guidelines specify that catch be unlikely to lead to overfishing. According to the available analyses, certain prohibited shark species—basking sharks (Campana, 2008), night sharks (Carlson et al., 2008), sand tiger sharks (Carlson et al., 2009), white sharks (Curtis et al., 2014), and bigeye thresher sharks (Young et al., 2016)—are not experiencing overfishing. While such analyses have not been completed for all of the prohibited shark species, there is no information suggesting that overfishing is occurring on species in this complex, except for dusky sharks, and the Amendment 5b rulemaking is undertaking AMs to end that overfishing.

Comment 21: One commenter stated that the 50 CFR 600.310(g)(3) provision does not exist in the Magnuson-Stevens Act, and the Supreme Court has held that Federal agencies cannot create exemptions to a statute that Congress did not already include.

Response: Section 50 CFR 600.310(g)(3) from the National Standard 1 guidelines is consistent with, and not an exemption to, the Magnuson-Stevens Act. The Act requires that FMPs establish ACL/AM mechanisms with the goal of preventing overfishing from occurring, 16 U.S.C. 1853(a)(15). Section 600.310(g)(3) explicitly provides that its provisions may be invoked if there is an ACL of zero, an AM that is a closure, and “catch is unlikely to result in overfishing.” Response to comment 46 in the final National Standard 1 guidelines revisions (81 FR 71858; October 18, 2016) explains that § 600.310(g)(3) is an optional tool that will only apply to a limited set of cases where there is no way to account for the small amounts of bycatch occurring and, therefore, it is not pragmatic to establish AMs to try to account for such small amounts of bycatch that are unlikely to result in overfishing. NMFS notes that, as a statutory matter, the national standard guidelines do not have the force and effect of law, 16 U.S.C. 1851(b). Consistent with Magnuson-Stevens Act requirements, as detailed in Chapter 4 of the FEIS, there is an ACL/AM mechanism for prohibited shark species, and bycatch of dusky sharks is unlikely to result in overfishing under the Amendment 5b management measures.

Comment 22: A few commenters objected to setting the dusky shark ACL to zero on the grounds that it will lead to further restrictions in fisheries that interact with dusky sharks as the population recovers and interactions with the species increase accordingly due to their increasing abundance. With an ACL set equal to zero, NMFS would have no way to measure success, and dusky shark will inevitably become another choke species that will lead to unnecessary fisheries closures that the commercial and recreational fisheries cannot afford.

Response: The Magnuson-Stevens Act requires fishery management measures to end and prevent overfishing and to rebuild overfished stocks. An ACL of zero for the prohibited shark complex, including dusky sharks, in conjunction with the continuation of measures adopted in the dusky shark rebuilding plan thus far (e.g., Amendment 2) and the new AMs outlined in Amendment 5b, will prevent overfishing. NMFS agrees that as the population recovers and the dusky shark stock increases, an increase in interactions could occur. NMFS will continue to monitor dusky sharks through the available fishery-dependent and -independent data sources, and future stock assessments, and consider additional management measures in the future if necessary.

Comment 23: One commenter stated that, while NMFS' intention to monitor bycatch levels of prohibited sharks is necessary, there are no means to determine if bycatch mortality falls within safe ranges because nearly all the prohibited shark species have not undergone a stock assessment. Furthermore, the commenter stated that each of the prohibited shark species is unique with different life history traits, different bycatch levels, and different vulnerabilities. To address this concern, the commenter suggested creating four subgroups of prohibited shark species reflecting high and low levels of fishery interactions and high and low vulnerability based on life history traits. The commenter felt these subgroups could provide a way to prioritize monitoring and stock assessments, and those species with a high vulnerability and high fishery interactions could be prioritized over those with a low vulnerability and low fishery interactions. The commenter noted that this process could occur outside of the Amendment 5b rulemaking process.

Response: Many of the prohibited sharks do not have stock assessments. Stock assessments for prohibited species are often complicated by a near or complete lack of data.

However, as this commenter noted, there are ways to prioritize monitoring and stock assessments among the prohibited sharks. NMFS has used methods to prioritize monitoring and stock assessments of prohibited sharks since first beginning management of Atlantic sharks with the 1993 FMP. Based on this prioritization, an initial analysis was performed of sharks that have more vulnerable life history traits and presumably higher levels of fishery interaction. Based on this information, retention of dusky sharks was prohibited through the 1999 FMP, effective in 2000. The Brief Management History section of Chapter 1 has more detail and final rule references for this action. NMFS later created a Vulnerability Evaluation Working Group in 2008 to provide a methodology to determine vulnerability (a function of both biological productivity and susceptibility to fisheries) of a wide range of US fish stocks (Patrick et al. 2009, 2010). Atlantic HMS sharks, including prohibited species, were part of this Productivity and Susceptibility Analysis (PSA), which found that the vast majority of prohibited species fell in the same region of the PSA plot (see Figure 5 in Patrick et al. 2009) indicating similar vulnerability. It was noted in the document that 12 of the 14 prohibited species had some of the lowest susceptibility scores of all HMS Atlantic sharks. NMFS welcomes comments on ways to improve the stock assessment prioritization process, and may consider such changes in the future. However, this comment remains beyond the scope of Amendment 5b.

C. Dusky Shark Stock Assessment and Mortality Reduction Targets

Comment 24: One commenter noted that the dusky shark assessment update may not be accurate because it did not consider several issues, including fishermen avoidance of the species since 2000; the potential non-reporting of dusky shark catches; flaws in some fishery independent surveys to account for range shifts due to climate change and other factors; and continuing problems in species identification. That commenter felt the next assessment should

be a benchmark assessment that considers these issues. Another commenter noted the need to conduct a benchmark assessment for dusky sharks to address these and straddling stock (trans-international boundary) issues. Commenters also stated that future dusky shark stock assessments should include data from Mexican and Cuban water fisheries that also interact with dusky sharks.

Response: Both the SEDAR 21 dusky shark stock assessment and stock assessment update acknowledge the uncertainties in all of the input data sources. However, these uncertainties were characterized to the extent possible and accounted for within the assessment model runs. NMFS has not yet scheduled the next dusky shark stock assessment, and agrees that the next dusky shark assessment should include a review of all available data sources, and should also investigate methods for addressing changes in management and fishing behavior, the validity of fishery-independent sources, environmental factors, potential data from neighboring nations that may catch dusky sharks, and other relevant information to improve the assessment.

Comment 25: Some commenters were opposed to NMFS' decision to use mortality reduction targets estimated to provide a 50-percent probability of rebuilding the dusky shark stock by 2107. They contend that previous actions involving Atlantic HMS sharks have generally used the 70-percent probability for other sharks and that NMFS, in the Predraft for Amendment 5b, stated that the 70-percent probability is the most appropriate. The commenters stated that the necessary mortality reductions should reflect the 70-percent probability threshold given the fact that previous measures have failed to end overfishing over the last 10 years. One commenter stated that NMFS' rationale for using the 50-percent probability is incorrect. The commenter stated that while NMFS chose the 50-percent probability because the dusky shark assessment was highly uncertain, it was no more uncertain than the last dusky assessment and

assessments for other shark species. The commenter also stated that NMFS chose the 50-percent probability because the assessment results were more pessimistic than expected, so NMFS changed the mortality reduction objective rather than properly addressing the results of the assessment. One commenter who supported the use of a 50-percent probability threshold noted that 50-percent is a commonly used standard that has been judicially-approved for ending overfishing and the 50-percent threshold makes sense given the higher level of uncertainty associated with the update compared to past stock assessments.

Response: NMFS' determination to use the fishing mortality reduction associated with a 50-percent probability of rebuilding by 2107 is a standard approach in many NMFS stock rebuilding plans, is consistent with the Consolidated HMS FMP, and is scientifically justified as detailed in Section 1.2 of the FEIS. While NMFS typically uses a 70-percent probability for Atlantic highly migratory shark species, the 2016 update has a higher level of uncertainty than other shark assessments and presents a more pessimistic view of stock status than was expected based on a preliminary review of similar information and other available information. Such information includes the information reviewed in the ESA Status Review, reductions in U.S. fleet fishing effort due to management actions not reflected in the 2016 stock assessment update, and improved age and growth information indicating that dusky sharks have faster age and growth dynamics than previously thought, which likely results in higher productivity than that considered in most of the model scenarios of the 2016 stock assessment update (Natanson et al., 2014). It is possible that the "high productivity" model scenario encompassed the effects of this new life history information, while also reducing the plausibility of the "low productivity" scenario. This information could not be directly used in the 2016 assessment update, because assessment updates only incorporate data inputs (e.g., time series, life history parameters, etc.)

that were previously vetted through the SEDAR process and approved as part of the most recent benchmark assessment. Here, that was the 2011 benchmark stock assessment (SEDAR 21). Based on its review of the 2016 update, understanding about the operation of the HMS fisheries under current management measures, and other available information, the F estimate associated with the 50-percent probability more accurately reflects current fishing pressure and accounts for the new information on dusky shark productivity than the F estimate associated with the 70-percent probability. Because of these issues, NMFS decided it was appropriate from a scientific perspective to use the F reduction associated with the 50-percent probability of rebuilding by the deadline in Amendment 5b. Using the F reduction associated with a 50-percent probability, rather than a 70-percent probability, appropriately reflects this change in risk tolerance while remaining sufficiently precautionary and is consistent with the standard used in rebuilding plans for most NMFS-managed stocks.

From a statistical perspective, the wider confidence band in the projections results in the F estimate associated with a 70-percent probability being substantially lower than the apical value (the value at the peak of the distribution of F estimates). Thus, the F reduction associated with 70-percent goes well beyond what NMFS would consider appropriately precautionary even for species with relatively slow life history such as sharks. NMFS also notes that the rebuilding year (i.e., length of time the species could rebuild with no fishing mortality plus one mean generation time) was calculated using a 70-percent probability, as is typically done in assessments, which additionally increases the likelihood of achieving rebuilding within the mandated time period. Furthermore, while the probability of rebuilding the dusky shark stock by 2107 with a 35-percent mortality reduction is 50 percent, the probability of this mortality

reduction immediately ending overfishing is approximately 77 percent according to the results of the final 2016 stock assessment update.

Comment 26: One commenter specifically called for an ACL that will achieve at least a 50-percent reduction in dusky shark fishing mortality across all fisheries to ensure a 70-percent probability of successfully rebuilding by 2107, as designated by the U-Shaped mortality scenario described in the DEIS and the recent SEDAR 21 stock assessment update. Another commenter suggested that only an 8-percent reduction in fishing mortality is necessary because the U-shaped mortality scenario F/F_{MSY} is only 1.08.

Response: NMFS acknowledges that the 2016 stock assessment update provided five different model runs, all of which represent plausible states of nature for the dusky shark stock, consistent with the SEDAR 21 benchmark assessment. However, as described in the assessment documents and Section 1.2 of the FEIS, there is no scientific basis to select one model run over another. Therefore, consistent with the approach used in comparable situations in other stock assessments, a multi-model inference was made using the results of the median model. In this case, the U-shaped Natural Mortality model run recommends a 53-percent reduction in mortality to achieve a 70-percent probability of rebuilding by 2107. As described in the response to Comment 25 above, use of a 50-percent probability of rebuilding is warranted in this case.

Therefore, NMFS has determined that the best available scientific information supports the use of the median model and a mortality reduction associated with a 50-percent probability of rebuilding by the deadline (i.e., 35 percent). Furthermore, there is no acceptable ACL associated with achieving any of the mortality reductions presented in the stock assessment update, as described in Section 1.2 of the FEIS. The ACL for the prohibited shark complex is zero, and this action is reducing mortality on dusky sharks using other measures since there are insufficient

data to quantify catch or TACs with any certainty. Finally, NMFS disagrees that under the U-shaped mortality scenario, only an 8 percent mortality reduction is needed. An 8-percent mortality reduction may end overfishing, but would not rebuild the stock as required. A 35-percent mortality reduction is needed to end overfishing with a 50 percent probability and will be achieved by the measures adopted in this Amendment.

Comment 27: The EPA suggested clarifying why it is appropriate to set a 35-percent mortality reduction target for dusky sharks when the 2011 stock assessment recommended a 58-percent decrease relative to 2009 levels.

Response: The mortality reduction targets changed after the 2016 assessment update and, as described in the response to Comment 25, NMFS has determined that Amendment 5b measures should reduce dusky shark mortality by 35 percent to end overfishing and rebuild the stock consistent with the most recent assessment update.

As detailed in Chapter 1, the 2011 SEDAR 21 dusky shark stock assessment used data through 2009. After finalizing that stock assessment and beginning rulemaking to implement a rebuilding plan for dusky sharks, it became apparent that management measures implemented after 2008 in HMS fisheries (e.g., measures in Amendment 2) had reduced dusky shark interactions and mortality. Furthermore, fishery-independent abundance indices prepared for the ESA status review showed increasing dusky shark population trends. Consequently, the Agency prioritized an update to the SEDAR 21 dusky shark stock assessment, using data through 2015, to incorporate recent management changes and updated fishery-independent indices. The SEDAR 21 dusky shark stock assessment update found that while the stock is still overfished and experiencing overfishing, the stock status was healthier than shown in the original SEDAR 21 assessment.

D. Shark Endorsement, Training, Species Identification, and Outreach

Comment 28: NMFS received numerous comments in support of the shark endorsement (Alternative A2), including from the South Atlantic Fishery Management Council (SAFMC), and the States of North Carolina, South Carolina, and Texas. NMFS received comments expressing concerns and recommendations regarding the shark identification and training quiz. The State of Mississippi commented that shark species misidentification is not a problem in Mississippi waters. One comment stated that a test to obtain a permit was unheard of in salt and freshwater fishing and many fishermen may decide simply not to fish for sharks to avoid the burden of the online course. Another commenter noted that because hunters need to take a safety class with bird identification in the State of Florida to get a hunting license, an online class such as what is proposed and another for all HMS species, particularly in regard to reporting requirements, in order to receive a vessel permit is reasonable. Another comment indicated that misidentification and lack of data are the underlying issues facing the rebuilding of dusky sharks, and both of these can be properly and sufficiently addressed through a comprehensive HMS shark endorsement program (as outlined in Alternative A2) with online education modules during issuance and renewal of the endorsement. The commenter suggested that the quiz should focus on prohibited species identification (specifically dusky, sandbar, or ridgeback sharks), best practices for safe handling interaction, and a cooperative data collection initiative through reporting requirements. The commenter felt that cooperatively increasing fisherman knowledge and understanding of resource interactions allows for responsible management while also creating a sense of responsibility and stewardship of the resource. Lastly, another commenter noted that most anglers who have the time, resources, and knowledge to fish offshore already know how to properly identify a fish before harvesting it.

Response: NMFS recognizes that the shark identification and regulations quiz accompanying the proposed shark endorsement represents a novel measure in the realm of marine recreational fisheries; however, it is by no means unprecedented in the realm of conservation management. As one of the supporting commenters noted, hunters in the State of Florida are required to take hunter safety classes that include a bird identification section, and similar hunter safety courses are required in almost all states. Compared to hunter safety courses, which historically could last an entire day or more, the proposed shark identification and regulations training course and quiz will place minimal burden on recreational anglers as it is intended to take only a few minutes to complete, while still conveying the necessary information in an efficient manner. The quiz will focus on dusky shark conservation to more effectively meet sustainability goals. Additionally, many commercial fishermen that pursue HMS fisheries have long been required to take extensive training workshops on the identification and safe release of protected species that can take a full day to complete. NMFS has identified accidental landings due to misidentification as one of the primary sources of dusky shark mortality in the recreational fishery. NMFS considered several alternatives to address this problem including drastically increasing the minimum size for sharks and making the recreational shark fishery catch-and-release only. Both of these alternatives will have been assured to largely end accidental landings of dusky sharks in Federal waters, but will have had a far greater impact on the recreational fishery while doing far less to target the underlying issue of misidentification. As such, NMFS decided to prefer the more targeted approach of education and communication that could be provided by the shark identification and regulation training course and quiz. NMFS realizes that many recreational HMS anglers already know how to identify HMS species, including dusky sharks, and are familiar with HMS regulations. However, NMFS cannot be

assured of getting the necessary information to those anglers who need it without requiring it of all Federal water anglers that wish to target and land sharks.

Comment 29: NMFS received a comment from the State of South Carolina which noted that they do not oppose the requirement for the shark endorsement for HMS permit holders fishing in Federal waters, but stated that NMFS needs to remove the phrase “fishing for sharks recreationally” to make it clear that the endorsement is needed to land sharks caught in Federal waters whether the angler in question was targeting sharks or not. The State of South Carolina Department of Natural Resources (South Carolina DNR) also stated that the proposed shark endorsement is in direct conflict with South Carolina law Section 50-5-2725 because permits are not required for the possession of sharks in South Carolina state waters. South Carolina DNR stated that, therefore, South Carolina would not enforce this final rule in its state waters.

Response: This final rule does not conflict with or preempt any state regulations, nor does it place any enforcement requirements on states. Recreational shark anglers fishing exclusively in state waters will not be required to obtain the shark endorsement just as they are not required to obtain an Atlantic HMS Angling or Charter/Headboat permit, and states need not enforce Federal regulations against shark anglers who do not hold Federal permits. However, those recreational shark anglers that wish to target, retain, and land sharks in Federal waters will be required to obtain a shark endorsement along with their Atlantic HMS Angling or Charter/Headboat permit. Once the angler has a Federal permit, as a condition of that permit, the angler must abide by the Federal regulations, regardless of where they are fishing, including in state waters, unless the state has more restrictive regulations, as specified in the Final Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (64 FR 29090; May 28, 1999). HMS permit holders have been required to follow federal requirements in state waters as a

condition of obtaining a federal permit since 1999 for commercial permit holders and since 2006 for recreational permit holders. As explained in the FEIS for the 2006 Consolidated HMS Fishery Management Plan, the previous differing requirements between state and Federal regulations and the inability to verify whether or not a particular fish onboard a vessel was caught in state waters or Federal waters generated confusion for the federal permit holders. The states have been previously consulted on these Federal permit conditions, and are regularly consulted on all HMS management plan amendments.

Comment 30: NMFS received a comment that supported the shark endorsement and suggested that NMFS implement the shark endorsement in non-HMS recreational fisheries that interact with sharks as well.

Response: NMFS only has authority to manage shark fisheries in Federal waters, and any recreational angler fishing in Federal waters of the Atlantic, Gulf of Mexico, or Caribbean that wishes to retain sharks must possess an Atlantic HMS Angling or Charter/Headboat permit. As such, all recreational anglers that fish in Federal waters of the Atlantic will be required to obtain the shark endorsement to retain sharks. Individual states and the Regional Fisheries Management Commissions and Councils have the option to require Atlantic HMS permits of anglers fishing in state waters or for non-HMS, but the authority to do so lies with them and not NMFS. As stated above, once the angler has a Federal permit, as a condition of that permit, the angler must abide by the Federal regulations, regardless of where they are fishing, including in state waters, unless the state has more restrictive regulations.

Comment 31: Commenters stated that NMFS should include a reporting requirement as part of the shark endorsement for all shark landing or develop a sampling protocol to survey shark populations to improve data reliability in the recreational sector.

Response: As described in Chapter 2 (under Alternatives Considered but Not Further Analyzed), NMFS is not planning to include reporting requirements as part of the initial implementation of the shark endorsement, which could result in duplicative data collection efforts in recreational fisheries (e.g., MRIP, the Large Pelagics Survey (LPS)). However, NMFS is hopeful that the endorsement can serve as a framework for improving the sampling of recreational anglers that target sharks for surveys like those conducted by MRIP. How well this works will depend on what percentage of HMS anglers acquire the endorsement. The more HMS permit holders that acquire the endorsement, the less of a targeted sample it would provide compared to the existing HMS Angling and Charter/Headboat permits. However, this is counterbalanced by the fact that the more anglers getting the endorsement means the more anglers that will be receiving the targeted outreach and education materials on shark identification, safe handling, and shark fishing regulations, and the more anglers would then provide the correct shark identification when responding to surveys.

As for the suggestion to include a reporting requirement in conjunction with the shark endorsement, HMS permit holders are already required to report their catches and landings when intercepted by NMFS catch and effort surveys like MRIP and the LPS. At this time, NMFS is not planning to require any additional reporting requirements similar to the requirements for billfish, bluefin tuna, and swordfish. The mandatory reporting requirement for most of these species is only to report fish that are landed (bluefin tuna reporting also includes dead discards), and because landing dusky sharks is prohibited, any similar reporting requirement for sharks should not provide data on dusky catches. NMFS is also reluctant to require reporting on released sharks as the agency does not have the authority to extend the requirement to state water anglers who are responsible for a significant portion of recreational catches and landings for

most shark species. This is not a concern with other HMS with mandatory reporting requirements as NMFS manages bluefin tuna to the shore, and billfish and swordfish are very rarely caught in state waters. NMFS is also in the process of reviewing the needs of MRIP and the LPS as part of the Regional MRIP Implementation Plan. As part of that review, NMFS is considering what, if any changes, are needed to improve recreational estimates of shark harvest.

Comment 32: NMFS received comments requesting an option to cancel the shark endorsement for fishermen when they are not fishing for sharks or sharks are not in their area. Other commenters expressed concern that providing an option for cancelling the shark endorsement throughout the year would create confusion as to who and when fishermen could retain/land sharks during a given year.

Response: NMFS believes the demand for the option to drop the shark endorsement will be largely negated by the new circle hook alternative (A6d) that requires endorsement holders to use circle hooks only when fishing for sharks, as opposed to the previously preferred alternative (A6a), which required the use of circle hooks whenever fishing with wire or heavy monofilament or fluorocarbon leader, as the new preferred alternative removes any potential conflicts with non-shark fisheries. If sharks are to be retained, circle hooks must be used, regardless of bait or gear configuration (with the exception of artificial lures and flies). NMFS will still provide the option for anglers to drop the shark endorsement if they so desire.

Comment 33: NMFS received a comment from the SAFMC suggesting that NMFS include a small fee for the shark endorsement to provide a minor barrier to entry. The comment noted that the fee would assist with defining the universe of fishermen actually targeting sharks, and thus improve the ability of the shark endorsement to provide a targeted sampling frame for

shark anglers. Other commenters stated that there should not be an extra fee for the shark endorsement because the HMS Angling Permit already has a fee.

Response: NMFS has considered the possibility of charging a separate fee for the shark endorsement, but has opted not to take that direction at this time as it does not represent a standalone permit. Additionally, NMFS does not want to unduly discourage permit holders from receiving the endorsement as the primary goal of the endorsement is to facilitate education and outreach on shark identification, safe handling, and fishing regulations while using the endorsement as a sample frame for data collection is only a secondary benefit. Furthermore, it is generally agreed that those anglers and charter/headboat captains that do not regularly target sharks, and are more likely to only interact with a sharks incidentally, are the ones that will most benefit from the educational aspects of the shark endorsement while also being the ones most likely to opt not to obtain it if it required paying an additional fee. As such, NMFS believes the benefits of the shark endorsement to dusky shark conservation will be maximized if a fee is not charged. Furthermore, NMFS does not see a need to limit entry into the recreational shark fishery to promote dusky shark conservation as they are not a target species, but are only caught incidentally.

Comment 34: NMFS received numerous comments regarding the online shark identification and training course. One commenter noted that the online quiz should be short and quick, and specifically address dusky sharks. Another commenter felt that the shark identification quiz should focus on prohibited species identification, and best practices for safe handling. To improve and evaluate the effectiveness of the shark endorsement, one commenter recommended that implementation of the endorsement and online training course follow key principles for effective e-learning, and include an evaluation component to assess its

effectiveness at educating permit holders. This commenter submitted detailed information on how to approach and evaluate adult learning in online training.

Response: In the interest of minimizing burden to the angling public, NMFS intends to keep the shark endorsement short and targeted. It will focus on key recreational shark fishing regulations (minimum size limits, bag limits, and circle hooks), and key identifying characteristics of prohibited shark species such as the interdorsal ridge. More detailed information on shark identification and safe handling techniques will be distributed to shark endorsement holders through targeted outreach materials that the angler can keep on hand for future reference. NMFS greatly appreciates the information and literature one commenter provided on adult learning and online training. NMFS will strive to apply adult learning principles in the design of the shark endorsement training and quiz. NMFS intends the shark endorsement quiz to be an adaptive tool that will be evaluated on a regular basis to determine which questions provide the most educational benefit, what topics require the most targeted outreach, and how the training course can be improved.

Comment 35: NMFS received a comment requesting that all applicants applying for the shark endorsement be asked to provide an estimated number of sharks caught in the previous year. The comment noted that many fishermen may choose to get the shark endorsement regardless of whether they intend to target sharks “just in case.” Providing information on the number of sharks caught in the previous year would allow NMFS to have a more accurate representation of the universe of fishermen targeting sharks in any given year.

Response: Asking shark anglers to recall the number sharks they have caught in the previous year as part of the shark endorsement would result in highly inaccurate responses given the long length of the recall period (12 months). None of the current MRIP surveys use recall

periods of anywhere near this length with most using recall periods of only two months. This measure is not considered reasonable because it would be duplicative with existing recreational fishery data collection efforts (e.g., MRIP, LPS) and would not meet the primary objectives of this amendment (i.e., ending overfishing and rebuilding dusky sharks). Furthermore, the collection of such data would likely be inaccurate and difficult, if not impossible, to verify as anglers would need to remember all trips and catches from the previous year. Existing data collection efforts, while still flawed, produce better catch and effort estimates than collection of such information once a year when someone is applying for a permit. Additionally, creation of this type of data collection would likely be costly in terms of the data management infrastructure needed, and the data management clearances required for the collection could delay implementation of this action, which is needed to end overfishing on dusky sharks. NMFS is currently looking at ways to improve MRIP and LPS data collection surveys for all HMS as part of its regional MRIP implementation plan. Any changes as a result of those data collection methods would result in more reliable recreational data than a once-a-year collection of information when people are applying for the shark endorsement.

Comment 36: NMFS received a comment from the SAFMC which noted that when applying for the shark endorsement, NMFS should make it clear that those fishermen holding the endorsement would need to use circle hooks in certain situations and that sharks caught incidentally on J-hooks would need to be released. Additionally, the SAFMC noted, when presented with the option to apply for the endorsement, NMFS should clearly inform fishermen that, without the endorsement, sharks cannot be retained.

Response: NMFS agrees with the SAFMC's comment that it is important to make it clear to anglers applying for the shark endorsement that circle hooks will be required when fishing for

sharks, that sharks incidentally caught on J-hooks will need to be released, and that the shark endorsement will be required to retain sharks caught in Federal waters. All of these issues will be highlighted during the permit application process and shark endorsement quiz.

Comment 37: NMFS received comments suggesting shark fishermen or all HMS permitted vessels be required to carry a shark identification placard (Alternative A3) instead of taking the online quiz to receive the shark endorsement.

Response: NMFS considered requiring HMS permitted vessels to carry a shark identification placard in alternative A3. NMFS did not prefer this alternative because while anglers could be required to carry a placard that, if used, might help identify dusky and other sharks, ensuring that anglers reference the material would be difficult. NMFS feels that Alternative A3 will provide for a more passive learning experience and does not provide feedback to the angler like the online shark endorsement quiz in Alternative A2. However, as part of the outreach and education campaign described in Alternative A2, NMFS intends to provide additional outreach materials, in addition to the placard, that anglers could use as a reference after taking the quiz.

Comment 38: NMFS received a comment requesting that NMFS require all HMS recreational permit applicants participate in a broader training course encompassing regulations on all HMS recreational fisheries including sharks. The comment noted that the HMS permit should be issued on completion of the training course.

Response: The purpose of this action is to address the specific issue of ending overfishing of dusky sharks in the Atlantic, and no additional benefit to dusky sharks would likely occur as a result of the broader training course suggested by the commenter. Rather, the commenter's suggestion was aimed at improving angler knowledge of all HMS identification and recreational

fishing regulations, which has not proven to be a significant issue. Using this action to require all anglers applying for an HMS permit to take a broad training course on HMS fisheries regulations and species identification to address a minor issue that is not targeted exclusively toward ending overfishing of and rebuilding dusky sharks is beyond the scope of this action.

While such a training course might be beneficial, issues of species misidentification have not proven to be a consistent problem and driver of overfishing in non-shark HMS fisheries. As such, NMFS believes that a more targeted course on shark identification and regulations will be more likely to achieve the goals of this action.

Comment 39: NMFS received numerous comments from recreational fishermen regarding the impact of the shark endorsement on data collection. One commenter noted the shark endorsement would provide a better estimate of recreational shark fishermen and increase the confidence in MRIP shark catch estimates. Other commenters were concerned that the shark endorsement would lead to inflated shark catch estimates, further noting that most HMS anglers would choose to get the endorsement, regardless of whether they plan to target sharks in order to keep the option for shark fishing open. Additionally, one commenter felt that the shark endorsement benefit would be minimized by the fact that HMS permits are vessel-based; therefore, the permit holder, rather than the individuals fishing, would be reporting.

Response: NMFS expects that the endorsement can serve as a framework for improving the sampling of recreational anglers that target sharks for MRIP surveys like the LPS. NMFS recognizes that the more HMS permit holders that acquire the endorsement, the less of a targeted sample it would provide compared to the existing HMS Angling and Charter/Headboat permits; however, this should not result in inflated estimates of sharks caught in Federal waters. The HMS Angling and Charter/Headboat permit lists are already used as sampling frames for the

LPS and the For-Hire Survey, which provide estimates of shark fishing effort and landings by HMS permit holders. If all HMS permit holders obtain the shark endorsement, then the survey sampling frames would remain the same, and the resulting estimates should be largely unchanged. However, the fact that HMS permits, and thus the shark endorsement, are vessel-based permits will limit its usefulness as a sampling frame for other MRIP surveys that are not vessel based, but instead target individual anglers.

Comment 40: NMFS received comments suggesting that NMFS update the shark identification placard to include information for dusky sharks. Other commenters felt that a dusky shark identification guide should be printed directly on the HMS Angling permit.

Response: In addition to the shark endorsement, NMFS will be conducting an extensive outreach and education campaign on shark identification and fishing regulations. This will include updating the existing shark identification placard, and developing dusky shark specific educational materials that will be distributed at locations that anglers frequent, such as tournaments or bait shops, and to individuals that acquire the shark endorsement. NMFS does not plan to print the shark identification guide directly on the HMS Angling permit at this time as this would substantially increase the size of the permit. Furthermore, NMFS has received numerous anecdotal accounts that anglers rarely read their permits and disseminating information through permits may not be effective.

Comment 41: NMFS received a comment expressing concern regarding the impact the proposed dusky measures will have on charter or recreational fishing vessels that fish for both sharks and tuna on the same trip. In New England, most sharks are caught incidentally when fishing for other pelagic species, particularly tuna. The comment noted that combined tuna and

shark trips are critical for charter fishing businesses and anglers should be allowed to fish for both species in the same day with the same permit.

Response: None of the provisions in Amendment 5b are intended to prohibit anglers from pursuing sharks and other HMS during the same fishing trip. An angler possessing a shark endorsement is not prohibited from fishing for other HMS when appropriately permitted to do so and consistent with requirements. Permit holders wishing to retain sharks will be required to use circle hooks to fish for sharks, unless they are fishing in New England waters north of 41° 43' N latitude, or are fishing with flies or artificial lures. This boundary line for the circle hook requirement was added to the new preferred Alternative A6d to eliminate any impacts to the HMS recreational fishery outside of the dusky sharks' known range. The exception for flies and artificial lures was added because NMFS heard from commenters, including the State of Florida and the SAFMC, concerned that fly fishing for sharks could inadvertently be impacted by the requirement to use circle hooks when targeting sharks with natural bait. Although not widely done at this time, some fishermen target sharks with fly fishing gear, usually with J-hooks. NMFS does not know of instances where cut or whole bait is used when fly fishing for sharks, but it is common for the terminal fly to include natural components such as bird feathers. Furthermore, it is well known by anglers, and verified by research, that artificial lures and flies rarely gut hook sharks or other fish species, and are much less likely to do the type of tissue or organ damage that leads to post-release mortality. For these reasons, in the final action, NMFS has preferred to specifically exempt shark fishermen using flies and artificial lures from the circle hook requirement.

Comment 42: NMFS received comments suggesting the need for cooperation between the Agency, States, and Councils to ensure that outreach materials reach recreational state water

fishermen. Commenters noted that recreational state-water fishermen have a high likelihood of misidentifying sharks. Furthermore, commenters noted recreational state-water fishermen in the State of North Carolina potentially are interacting with dusky and sandbar sharks depending on time of year and weather. The EPA also recommended that NMFS provide incentives to tournament organizers, fishery associations, etc., to encourage and enlist their participation in increasing fishermen's awareness of prohibited shark species identification and regulations.

Response: NMFS is aware that tournament anglers and anglers that fish exclusively in state waters make up a portion of the recreational shark fishery, and are likely interacting with dusky and sandbar sharks depending on their region and time of year and weather. As such, NMFS fully intends to work with the state agencies, commissions, councils, and shark tournament organizers to ensure that shark educational and outreach materials reach all of these anglers. NMFS will be developing a detailed outreach plan for dusky shark conservation efforts that will identify points of contact at state agencies, fishery management councils, and major shark fishing tournaments with a particular focus on those regions where dusky shark interactions are most common. Outreach efforts by NMFS will also target recreational fishing publications that cater to shark anglers.

E. Alternative A6 – Circle Hooks in the Recreational Fishery

Comment 43: NMFS received various comments regarding the proposed circle hook measure's potential to achieve mortality reductions. Some commenters felt that circle hooks would reduce the chance of gut hooking and increase the chance of post-release survival for dusky sharks, consistent with our analyses in the draft Amendment. Other commenters support the circle hook requirement for recreational shark fisheries but question the effectiveness of the requirement as it relates to reaching a 35-percent reduction in mortality given the inconsistency

of study results between different species of sharks. Additionally, NMFS received a comment that noted that Amendment 5b lacks sufficient quantitative analysis on how the circle hook requirement would achieve mortality reduction. Some commenters felt the circle hook requirement would negatively impact fishermen targeting other species and cause economic hardships while being unenforceable. Other commenters felt that little scientific evidence exists to support the mandatory use of circle hooks while some commenters noted that circle hooks are designed not to hook anything until they find a hard edge, reducing the chances of hooking internal soft tissue, and would be beneficial for sharks. Commenters further noted that more research is needed on the use of circle, J, and barbless J-hooks. The EPA commented that NMFS should provide incentives to tournament operators, fishery associations, etc., to encourage and enlist their participation in advocating for recreational fishermen's use of circle hooks by all Atlantic HMS permit holders participating in fishing tournaments when targeting or retaining sharks.

Response: Circle hooks provide demonstrably positive benefits to dusky sharks caught and released in the recreational shark fishery. While post-release survival is important for the stock health of most species, it can be particularly important for prohibited species because post-release mortality is the primary source of fishing mortality for the stock. As such, ensuring that dusky sharks are released in a condition that maximizes survival is an important way to reduce fishing mortality. Most evidence suggests that circle hooks reduce shark at-vessel and post-release mortality rates without reducing catchability compared to J-hooks, although it varies by species, gear configuration, bait, and other factors. Willey et al. (2016) found that 3 percent of sharks caught recreationally with circle hooks were deep hooked while 6 percent caught on J-hooks were deep hooked. A more detailed examination of these data provided to NMFS by

Willey et al. indicated even greater positive impacts specific to dusky sharks, showing a deep-hooking rate of 6 percent for circle hooks and 17.5 percent for J-hooks in dusky sharks (N=230); a reduction of 66 percent. Campana et al. (2009) observed that 96 percent of blue sharks that were deep hooked were severely injured or dead while 97 percent of sharks that were hooked superficially (mouth or jaw) were released healthy and with no apparent trauma. Therefore, assuming that deep hooking in dusky sharks results in comparable post-release mortality rates to those of blue sharks (96 percent), converting recreational shark fisheries from J-hooks to circle hooks should reduce the mortality rate of hooked dusky sharks by 63 percent $((17.5\% - 6.0\% / 17.5\%) * 96\% = 63\%)$. By requiring circle hooks for shark fishing in the recreational fishery, dusky sharks that are inadvertently caught in the recreational fishery would be more easily released in better condition, reducing dead discards and post-release mortality. While additional studies, including on the use of barbless J-hooks, are always helpful, the existing literature supports a circle hook requirement in the recreational shark fishery to reduce dusky shark mortality. As suggested by the EPA, NMFS intends broad-scale outreach across a number of fishing organizations to inform the affected public about new management measures and the dusky shark sustainability concerns.

Comment 44: NMFS received a large volume of comments expressing concern over the proposed definition of shark fishing for purposes of applicability of the circle hook requirement in the alternative preferred in the draft Amendment (A6a). Commenters, including the States of Florida and North Carolina, noted that the proposed language would have the effect of including fishing in multiple non-shark recreational fisheries such as swordfish deep dropping and trolling for billfish, tuna, wahoo, and mackerels. The proposed measure required that circle hooks be used by everyone who has the shark endorsement and who fishes with the specified natural

bait/gear configuration. The State of South Carolina opposed Alternative A6a as originally proposed, as it would place a significant burden on fishermen not fishing for sharks but who opt to get the endorsement in case they want to land a bycaught shark, specifically impacting fishermen trolling offshore for dolphin, wahoo, and tuna. Commenters suggested that NMFS remove the definition of shark fishing as it relates to applicability of the measure to avoid potential conflicts with other fisheries. Additionally, NMFS received comments, including from the SAFMC and the State of Texas that suggested the shark fishing definition should apply to all recreational fishermen targeting sharks, instead of all fishermen using wire, or heavy monofilament or fluorocarbon leaders, and natural baits and that doing so would minimize impacts of the measure and its attendant costs on non-shark fisheries. Furthermore, NMFS received comments stating that a better definition of shark fishing for the circle hook requirement would include chumming activities, large chunks of cut natural bait (dead or alive), wire greater than #9 gauge, multistrand cable, or monofilament leaders greater than 2.0 mm, activities that were excluded from the previous definition's approach.

NMFS received a comment suggesting that using hook size as an indicator of shark fishing, as proposed in another non-preferred alternative (Alternative A6b), would be complicated and ineffective. The comment noted that determining specific hook size requirements would be difficult given differences between manufacturers, especially regarding a multi-species fishery. NMFS also received comments from the State of Florida and the SAFMC requesting recreational fishermen using flies with natural components (i.e., hair, feathers) be exempted from the natural bait definition.

Response: NMFS agrees that definition of shark fishing proposed in the DEIS and proposed rule would sometimes impact other types of non-shark fishing. It is not NMFS'

intention to impose circle hook requirements on non-shark fisheries because those fisheries rarely interact with dusky sharks. For these reasons, NMFS modified the circle hook requirement, presented as Alternative A6d. Under this new preferred alternative, instead of requiring circle hooks when a specified gear configuration is used (e.g., strong leaders and natural bait, or the non-preferred option of hook size and natural bait), circle hooks will be required on any fishing line deployed to target sharks, unless artificial lures or flies are used since artificial lures and flies rarely result in gut-hooking. With this alternative, NMFS broadly requires circle hooks for all recreational shark fishing within a defined geographical boundary unless fishing with artificial lures or flies, as discussed below), rather than more narrowly when shark fishing with a particular gear/bait configuration. This measure ensures that all recreational shark fishing is included (except when fishing with artificial lures or flies) in the circle hook requirement while avoiding the unintended effect of requiring circle hook use in non-shark fisheries. Within the defined geographical boundary, shark possession and landing will still be prohibited if the shark was not retained on a circle hook or using an artificial lure or flies.

Chumming and large chunks of cut bait were excluded from the definition of shark fishing in the proposed rule/Draft Amendment because neither are used in all shark fishing trips, both are used in many other marine recreational fisheries, and their inclusion would have effectively limited enforcement of the circle hook requirement to when fishing activity was directly observed on the water. Additionally, what constitutes a large chunk of cut bait can vary considerably depending on the target species, including among different species of sharks. Alternatively, wire greater than #9 gauge, multistrand cable, and monofilament leaders greater than 2.0 mm all fell within the leader requirement within the definition of shark fishing under Alternative 6a, and comment was requested on the specific leader weight definitions. However,

given the general opposition to the leader requirement, and the definition of shark fishing, it was determined that another course of action was preferable to modifying the leader requirements for using circle hooks. NMFS heard from commenters, including the State of Florida and the SAFMC, concerned that fly fishing for sharks could unnecessarily be impacted by the requirement to use circle hooks whenever recreationally fishing for sharks. Although not widely done at this time, some fishermen target sharks with fly fishing gear or artificial lures, usually with J-hooks. NMFS is providing an exemption for artificial lures and flies from the circle hook requirement. Such lures, which mostly use J-hooks, are fished actively, meaning that sharks don't have an opportunity to swallow the hook, and are therefore mostly hooked in the mouth. There is no evidence that artificial lures or flies frequently cause gut-hooking and associated post-release mortality (Muoneke and Childress, 1994; Brownscombe et al., 2017). For this reason, in the final action, NMFS has preferred to specifically exempt shark fishermen using flies and artificial lures from the circle hook requirement.

Comment 45: The State of South Carolina suggested that NMFS exempt fishermen trolling from the circle hook requirement as the conservation benefit is unclear. NMFS also received comment that when trolling for tunas, sharks will sometimes get hooked in the lip when depredating the tuna catch. The commenter felt these sharks should be able to be retained.

Response: NMFS has decided, due to enforcement issues, not to include an exemption to the circle hook requirement for sharks caught while trolling. Allowing the retention of sharks caught on J-hooks introduces a loophole in the circle hook requirement and is counterproductive to NMFS' intention to reduce dusky shark mortality. If a fisherman wishes to retain sharks caught on J-hooks, they could simply contend that they were "trolling." NMFS' concern is that the only way for enforcement officers to know a shark was caught while trolling would be to

witness the catch as it happens. Conversely, an enforcement officer intercepting an angler landing a shark at the dock would have no way of knowing if the shark was caught while trolling or using another fishing method.

Comment 46: NMFS received several comments, including from the SAFMC, and the States of Florida, South Carolina, and North Carolina, suggesting NMFS define the type of circle hook (e.g. non-offset, non-stainless steel) required for Alternative A6a; specifically, the SAFMC and the States of Florida and North Carolina suggested that NMFS specify the use of non-offset and non-stainless steel circle hooks.

Response: NMFS agrees that it would be more effective to specify that non-offset, non-stainless steel circle hooks are required. These hooks reduce the chance of damaging the gut track of sharks if swallowed, and because they are corrodible, will deteriorate and fall out of the jaw of the shark if left in. These two features will reduce post-release mortality of dusky sharks. Additionally, non-offset circle hooks are also currently required to be used in billfish tournaments, and the South Atlantic snapper/grouper fishery, which also requires the use of non-stainless steel hooks. For these reasons, the circle hook measure for recreational fishing has been clarified to require non-offset, non-stainless steel circle hooks to maximize reductions in post-release mortality, and to be consistent with circle hook requirements in other recreational fisheries.

Comment 47: NMFS received comments from the SAFMC and the State of North Carolina supporting the requirement of circle hooks in shark fishing tournaments (Alternative A6c).

Response: NMFS agrees that circle hook use in shark fishing tournaments will be beneficial for dusky sharks for the same reasons they are beneficial in the greater recreational

shark fishery. Under Alternative A6d, fishermen fishing for sharks recreationally will be required to get a shark endorsement and will be required to use circle hooks when fishing for sharks whether they are fishing in a tournament or not, except when using flies or artificial lures. Requiring circle hooks in the greater recreational shark fishery, rather than only in shark tournaments, provides a greater conservation benefit for dusky sharks.

Comment 48: NMFS received a comment from the State of North Carolina requesting that circle hooks not be required to retain, possess, or land sharks if an angler catches a shark when targeting non-shark species. The comment noted that allowing the retention of incidentally caught sharks would prevent dead discards.

Response: While NMFS can understand why it would appear desirable to allow anglers to retain sharks incidentally caught on J-hooks, the agency is concerned that doing so would undermine the enforcement of the circle hook requirement when targeting sharks. If shark anglers were permitted to land sharks incidentally caught on J-hooks, they could continue to fish exclusively with J-hooks and simply claim any shark they catch was caught incidentally. As such, NMFS has determined that requiring the release of all sharks caught on J-hooks is essential to the enforcement of the circle hook requirement.

Comment 49: NMFS received comments suggesting that the circle hook requirement be extended to all HMS recreational fisheries to reduce post-release mortality in all HMS fisheries.

Response: The goal of Amendment 5b is to end overfishing of the dusky shark stock, and requiring the use of circle hooks when fishing for all tunas, billfish, or swordfish would not accomplish this goal. Furthermore, while there is evidence that circle hooks are effective in reducing dusky shark post-release mortality, not all studies have conclusively found that circle hooks significantly reduce post-release mortality for all HMS species across all HMS

recreational fisheries. Also, NMFS heard during the public comment period that circle hooks are not appropriate for all fishing styles (e.g., deep drop fishing or trolling). While NMFS encourages anglers to adopt the use of circle hooks in a manner that appropriately contributes to the needed mortality reduction for dusky sharks, the Agency also recognizes that data and the conservation goals of the current action do not warrant a blanket extension of the circle hook requirement to all HMS recreational fisheries at this time.

Comment 50: NMFS received comments requesting that circle hooks only be required on the lines targeting sharks, not all lines that are deployed. The commenters stated that at times fishermen may have multiple lines deployed, and only some of those lines are specifically targeting sharks.

Response: Under the new circle hook alternative (A6d), HMS permit holders will only be required to use circle hooks when fishing for sharks, and this can be determined by the angler on a line-by-line basis. Circle hooks are required for any line that is targeting sharks. Anglers will be required to release any sharks incidentally caught on lines with J-hooks targeting other species. As such, HMS anglers will have to weigh their desire to use J-hooks against their desire to retain incidentally-caught sharks, and make their hook choices accordingly.

Comment 51: NMFS received a comment requesting the requirement of barbless J-hooks instead of circle hooks for recreational fishermen.

Response: While NMFS encourages anglers to use barbless hooks, which can allow easier releases, be they circle or J-hooks, NMFS does not have information indicating that barbless J-hooks provide better conservation benefits for sharks than do circle hooks. While barbless J-hooks could certainly be removed from a shark's jaw with less damage than a circle hook, barbless J-hooks would still have a higher probability of deep hooking, which is the larger

concern for post-release mortality of incidentally caught dusky sharks. As such, NMFS does not believe a requirement to use barbless J-hooks would accomplish the objectives of this action.

Comment 52: NMFS received several comments, including from the Commonwealth of Massachusetts, opposing the circle hook requirement in New England offshore waters given the rare seasonal occurrence of dusky sharks in the region. The commenters stated that tournament catch data collected in Massachusetts from 1987-2014 indicated low dusky interactions off Massachusetts with the majority of shark catch consisting of blue, shortfin mako, and common thresher sharks. Additionally, commenters noted studies that suggest a lack of evidence for reducing deep-hooking of shark species commonly caught in New England waters such as shortfin mako sharks, thresher sharks, and porbeagle sharks. Commenters, including the Commonwealth of Massachusetts, requested that NMFS set a demarcation line if the circle hook requirement is implemented. Some commenters noted a demarcation line in the vicinity of Shinnecock, NY (40° 50' 25" N) extending to the east. Additionally, the Commonwealth of Massachusetts noted a demarcation line extending southeast from the eastern tip of Long Island, NY.

Response: NMFS agrees that measures to reduce dusky shark mortality would have little utility in areas beyond dusky sharks' range. For Alternative A6d, NMFS undertook an analysis of available data to determine the northern extent of the dusky shark range. Based on the analysis, NMFS has determined that, at this time, dusky sharks are not found north of 41° 43' N latitude, located around the southeastern edge of Cape Cod. Although fishermen fishing for and retaining sharks north of this line will need to obtain a shark endorsement, shark fishermen will not need to use circle hooks. This line is somewhat north of some suggestions; however, the line was placed in a location to ensure that all dusky sharks caught in the recreational shark fishery

are given the best odds of post-release survival. Dusky shark distribution will be examined periodically, and if the dusky shark's range expands northward (e.g., as a result of climate change or as result of the species rebuilding), the boundary line may be moved in a future regulatory action.

Comment 53: NMFS received comments suggesting that the economic impact of the proposed dusky measures for New England recreational, Charter/Headboat, or Atlantic tunas General category permit holders were not considered. Requiring the release of mako sharks incidentally caught on J-hooks would further negatively impact these permit holders.

Response: NMFS fully analyzed the economic impacts (refer to Chapters 4-7 of the FEIS) and concluded that it expects the economic impacts of the circle hook requirement to be minimal. Sharks that are incidentally caught are by definition not the primary target species of the trip, and thus should not be a major driving decision in a charter client's decision to go on the trip. However, to further minimize the potential impacts outside of the dusky shark's range, NMFS has revised the alternative so that it will exempt anglers fishing north of 41° 43' N latitude from having to use circle hooks to land sharks. This line marks the northernmost range of the dusky shark based on the best available fishery independent data. HMS permit holders fishing north of this line will be permitted to land sharks caught on J-hooks and will not be required to use circle hooks when targeting sharks.

Comment 54: NMFS received comments suggesting that an exemption to the circle hook requirement be made for shortfin mako and thresher sharks. The comments noted that these species are occasionally caught incidentally while trolling for other species with J-hooks and, although not targeted with J-hooks, are retained because they are a "trophy" catch.

Response: As mentioned in previous comment responses, NMFS has modified its circle hook alternative to exempt shark anglers from the requirement to use circle hooks in New England waters north of 41° 43' N latitude. As such, anglers fishing north of this line will be allowed to retain sharks caught on J-hooks. Shortfin mako and thresher sharks are among the most commonly targeted sharks in the Atlantic. MRIP data in the Mid-Atlantic region, where dusky shark interactions are most frequent, shows that many trips where dusky shark interactions are reported are on trips targeting mako sharks. As such, exempting anglers targeting shortfin mako and thresher sharks from the circle hook requirement would greatly reduce its ability to meet the conservation goals of this action.

F. Commercial Alternatives

Comment 55: Numerous commenters, including the States of North and South Carolina, stated that the requirement to release a shark by cutting the leader no more than three feet from the hook as specified in Alternative B3 should be modified to provide an exemption for situations when the safety of the fishermen is in question. For example, of particular concern were situations when the fishermen are working from a vessel with a high gunwale in heavy seas, or situations where a tight line may recoil back at the fisherman after cutting the line. Some commenters suggested the “three feet or less” language should be removed so that the alternative simply states the leader should be cut as close to the hook as safely possible.

Response: NMFS agrees that there may be times when it is unsafe to cut a leader within three feet of the hook. Each of the conditions and gear attributes described in these comments could reduce the feasibility of cutting the leader three feet or less away from the hook. For these reasons, NMFS has changed the preferred alternative in this final action to require releasing of sharks not to be retained by using a dehooker or by cutting the leader/gangion less than three feet

from the hook as safely as practicable. As described below, removal of as much fishing gear as possible, in as safe a manner as possible, should increase post-release survival of sharks while also addressing safety concerns for fishermen onboard the vessel.

Comment 56: Several commenters expressed that NMFS should encourage commercial fishermen to follow the status quo and not create new specifications or require new gear regarding the release of sharks. Fishermen currently have safe handling and release protocols, they attend safe handling and release workshops on a regular basis, and they carry the necessary gear on the fishing vessel to release all non-target catch.

Response: NMFS agrees that commercial fishermen currently have gear and protocols onboard that specify the handling and safe release of non-target species and bycatch. As explained in the comment below, NMFS prefers not to specify a certain type of dehooker or line cutter as commercial fishermen most likely already have the necessary gear onboard. However, while commercial fishermen are required to release marine mammals, sea turtles, and smalltooth sawfish, and release all HMS that are not retained in a manner that will ensure maximum probability of survival without removing the fish from the water, Alternative B3 specifically addresses all sharks that are not retained, as the identification of sharks is often difficult, especially while sharks are still in the water. Removal of gear is known to increase post-release survival for other species, such as sea turtles and thresher sharks. While NMFS recognizes that hooks may not be removed from sharks due to safety concerns during certain conditions, NMFS encourages commercial fishermen to remove as much gear as safely possible. This could help prevent situations where the sharks' tails become entangled in the gear or the gear becomes wrapped around the sharks' bodies impeding their ability to feed and/or swim. Research on other pelagic species indicates that the more gear that is removed, the higher the post-release

survival. Thus, under this alternative, fishermen will be required to release sharks in a manner that removes either all or most of the gear given safe handling and release protocols and gear that commercial fishermen currently possess.

Comment 57: Another commenter stated that using a thresher shark study estimate for reduction in post-release mortality due to reduced trailing gear as a proxy for dusky shark impacts is not appropriate and that dusky-specific estimates are required.

Response: While NMFS agrees it would be ideal to have a dusky-specific estimate to quantify the potential decrease in mortality that would be associated with the removal of gear, current research on this does not exist. In the absence of that research, NMFS feels it is most logical to use research on similar species, such as thresher sharks and smalltooth sawfish, as well as information for sea turtles and marine mammals, as proxies for estimating mortality reductions, because that currently represents the best available scientific information.

Comment 58: In regard to the requirement to use dehooking devices when releasing sharks, a commenter said NMFS should specifically require use of the “I” type dehooker device instead of the “Z” type device, as the commenter contends the latter is much more difficult and dangerous to use properly.

Response: At this time, NMFS prefers not to specify the type of dehooker fishermen are required to use when releasing sharks. Although different dehooking devices may provide advantages in certain situations, NMFS leaves dehooker type to the discretion of fishermen.

Comment 59: Commenters, including States of North Carolina and Texas, and the SAFMC, generally supported Alternative B9, which requires the use of circle hooks by shark directed permit holders in the bottom longline fishery. The State of South Carolina also supported the alternative, but stated that the alternative should be modified to specifically require

the use of non-offset, non-stainless circle hooks. Other commenters also requested that NMFS be more specific about the type of circle hooks, specifically, non-offset, non-stainless steel circle hooks should be required. Another commenter supported Alternative B9 and suggested that such hooks should be required for incidental shark permit holders in addition to directed shark permit holders. Other commenters stated that circle hooks should only be required when targeting small or large coastal sharks, allowing the continued use of J-hooks when targeting non-shark species.

Response: NMFS agrees that requiring circle hooks in the directed bottom longline shark fishery should help reduce the mortality of incidentally caught dusky sharks because individuals will be released in better condition with a better chance of survival. Regarding the suggestion of using non-stainless steel hooks, current regulations already require that bottom longline fishermen use non-stainless steel, corrodible hooks. Regarding the suggestion of using non-offset circle hooks, NMFS disagrees. The pelagic longline fishery is allowed to use some circle hooks that are offset less than 10° in order to allow the hooks to be baited. Because there is overlap between the fishermen using pelagic longline and bottom longline gear and because circle hooks are required in other fisheries and may have other requirements, to reduce conflict between regulations, NMFS has decided to allow fishermen to choose circle hook offset type at this time.

The intent of the directed bottom longline shark fishery circle hook requirement is to reduce mortality of dusky sharks caught and released on bottom longline, one of the few commercial fisheries that does not have a circle hook requirement. Dusky sharks most often interact with bottom longline gear when the gear is fished in a manner meant to target sharks, as is shown in the large coastal shark and sandbar shark research fisheries. Some of the other non-HMS bottom longline fisheries that do not target sharks require non-stainless steel circle hooks

and dehookers such as the South Atlantic snapper-grouper bottom longline fishery and vessels participating in the Gulf of Mexico reef fish fishery when using natural bait. Many of these fishermen possess HMS incidental shark fishing permits (see Table 5.2 in the FEIS), and therefore are most likely already using circle hooks when fishing in a bottom longline fishery and not targeting sharks; as such, any dusky sharks caught in these fisheries would experience the conservation benefit of circle hooks. Therefore, NMFS believes that requiring circle hooks for incidental shark permit holders is not necessary at this time. Directed shark permit holders fishing with bottom longline gear, however, will be required to use circle hooks regardless of the target species to make a clear distinction for the enforcement of the regulation. If directed shark permit holders were not targeting sharks, but fishing with J-hooks and still interacting with sharks, it would make the regulation difficult to enforce.

Comment 60: Other commenters opposed the proposed alternative to implement circle hooks in the shark bottom longline fishery. One commenter stated that when fishing with J-hooks, he has no bycatch of other species, and the J-hook catches the majority of the sharks in the corner or side of the mouth, similar to circle hooks. The commenter noted that with circle hooks, bycatch rates of other non-HMS (snapper, snapper, etc.) rises dramatically no matter what size hook is used. That commenter further stated that in his experience sharks that swallow J-hooks are always sharks that can be kept legally. In addition, that commenter noted that sharks are easier to release on a J-hook than when on a circle hook; when on a J-hook, the sharks tend to release themselves if given enough line slack and are easier to dehook. The commenter is concerned that sharks caught on circle hooks are harder to release or cut off, and that the added time in releasing the shark could cause more stress on the shark.

Response: NMFS disagrees. Recent research on pelagic longline and rod and reel indicate that circle hooks could reduce post-release mortality by approximately 40-63 percent. If those rates are comparable bottom longline gear, then that mortality reduction could occur in the portion of the bottom longline fishery that is converted from J-hooks to circle hooks (25 percent). Because the bottom longline fishery is observed to interact with hundreds of dusky sharks per year, then this measure is expected to significantly contribute to the overall mortality reduction of 35 percent. Gulack et al., suggests that the typical large J-hook used in commercial shark fishing keeps sharks from easily swallowing the hooks, resulting in no significant difference in shark mortality when compared to circle hooks. However, because circle hook use did not reduce the catchability of sharks compared to J-hooks, the requirement of circle hooks in the shark bottom longline fishery could prevent commercial fishermen from using smaller J-hooks that could be swallowed by sharks. This research also showed that keeping sharks in the water that are not retained would likely increase post-release survival.

In addition, data from the observer program in 2015 indicate that 11 directed shark trips with 16 observed shark hauls resulted in only 22 non-HMS fish caught (3 percent of total catch) and 75 percent of these sets used circle hooks. In 2014, 22 hauls on 14 directed shark trips were observed targeting coastal sharks in the southern Atlantic. During those trips only 11 non-HMS fish were caught (less than 1 percent) and 63.6 percent of these sets used circle hooks. Thus, bycatch of non-target species when using circle hooks does not seem to be a significant issue and would not offset the potential conservation benefit to dusky sharks and other non-target species.

Finally, in terms of removing circle hooks versus J-hooks from sharks, the current dehooking devices required to be carried by bottom longline fishermen are designed to work well for circle hooks when used properly. When the hook is in the jaw, it may be easier to remove a

J-hook, but when J-hooks end up in the throat or gut of the animal, they are more difficult to remove than circle hooks.

Comment 61: Numerous commenters expressed support for the relocation protocol in Alternative B6, but several, including the States of North Carolina, South Carolina, and Texas, and the SAFMC, questioned whether the one nautical mile minimum relocation distance was far enough to effectively avoid a highly migratory species like dusky sharks. Some commenters also stated that the relocation protocol was unenforceable. NMFS received a comment suggesting that a better approach would be to form a working group of fishermen, researchers, non-governmental organizations, and NMFS staff to develop a more scientifically sound, practical approach. This group could also work towards developing strategies to collect and analyze dusky shark interaction data, along with oceanographic data, that could be used to develop predictive models for dusky presence/absence.

Response: HMS pelagic and bottom longline fishermen currently have to relocate one nautical mile when they interact with marine mammals or sea turtles, and bottom longline fishermen need to relocate one nautical mile when they interact with smalltooth sawfish. The decision to have these and gillnet fishermen move one nautical mile if they interact with dusky sharks mirrors the current regulations for marine mammals and sea turtles, which are also pelagic and capable of moving long distances, in the Atlantic HMS pelagic and bottom longline fisheries. These species tend to aggregate along discrete water temperature fronts or near certain bathymetric features, so moving away from these features or water conditions, even relatively short distances (e.g., 1 nm), can reduce the potential for additional interactions. Like dusky sharks, sea turtles, marine mammals, and sawfish can also move large distances in short periods of time; however, the direction of the relocation away from the conditions where an interaction

took place is likely more important than the distance alone (e.g., moving 1 nm to a deeper depth would likely have more effect than moving 1 nm along the same depth where an interaction occurred). Based on this information, we expect 1 nm will also be appropriate for dusky sharks, while maintaining consistency with existing relocation regulations for other species and therefore encouraging compliance. We are encouraging fishermen to move more than 1 nm when appropriate given the local conditions as an additional precautionary measure.

Comment 62: One commenter suggested the relocation protocol should also be extended to non-HMS fisheries that also interact with dusky sharks.

Response: As detailed in Section 1.2 of the FEIS, there are very small amounts of dusky shark bycatch in non-HMS fisheries. Implementing relocation protocols in those fisheries would provide very little conservation benefit for dusky sharks. However, NMFS will work with states and Fishery Management Councils, and Commissions, as appropriate, to suggest commensurate changes in other fisheries that interact with dusky sharks.

Comment 63: A commenter expressed opposition to Alternative B6 on the grounds that the relocation protocol would be too burdensome on longline fishing vessels, and would ultimately require them to move so far away from where they are fishing that it would negatively impact them economically. Conversely, other commenters indicated that commercial fishers already practice a relocation protocol within the fleet and that they actively avoid sharks, such as dusky sharks, as the sharks tend to tear up their gear.

Response: NMFS anticipates that the relocation protocol should have minimal costs to fishermen given it only requires them to move one nautical mile after a set is complete, and this requirement is similar to the requirement already in place for several protected species. Several fishermen commented that many members of the HMS commercial fleet are already practicing

dusky shark avoidance so the costs to them should be neutral. Furthermore, the outlined communications protocol that will be required by this alternative should help many fishermen avoid setting their gear in areas containing dusky shark in the first place. Finally, the costs associated with Alternative B6 should be minimal when compared to other alternatives that were considered (e.g., hotspot closures, closing the pelagic longline fishery, etc.).

Comment 64: A commenter suggested that NMFS and fishermen should collaborate with the U.S. Coast Guard to broadcast the presence of dusky sharks in an area to other vessels to help facilitate the fleet communication and relocation protocol.

Response: Several fishermen commented that many members of the HMS commercial fleet are already practicing dusky shark avoidance as interacting with the sharks tends to tear up their gear. In addition, the availability of satellite phones has allowed the fleet to communicate effectively with one another. Other fisheries have developed more formal protocols for fleet avoidance of certain species, such as yellowtail flounder. However, they use third-party vendors to disseminate such notifications, not the U.S. Coast Guard. If the current communication and relocation protocol proves to be ineffective, then NMFS can reevaluate a more structured approach in the future. However, at this time, it is likely that fishermen would have more immediate information as to where dusky sharks are interacting with fishing gear and are thus the best source of information on dusky presence.

Comment 65: Commenters provided broad support for the addition of a shark identification and safe handling section to the current protected species safe handling workshops under Alternative B5. Some commenters suggested the workshops should also be required of state-licensed commercial shark fishermen, and that opportunities to participate in the workshops should be made available to recreational shark anglers as well.

Response: Both recreational and commercial fishers are welcome to attend the safe handling, release, and identification workshops held by NMFS. NMFS recommends that all fishermen register to check for availability ahead of a workshop, especially if they are not required to take such a workshop. More information on the safe handling, release, and identification workshops can be found at:

http://www.nmfs.noaa.gov/sfa/hms/compliance/workshops/protected_species_workshop/requirements.html

Changes from the Proposed Rule (81 FR 71672; October 18, 2016)

As described above, as a result of public comment and additional analyses, NMFS made changes from the proposed rule, as described below.

1. Circle hook requirement in the recreational shark fishery (§§ 635.4(b)(1), (c)(1), and (c)(5); 635.21 (f)(2), (f)(3), (k)(1), and (k)(2); 635.22(c)(1); 635.71 (d)(22) and (d)(23)). NMFS proposed to require the use of circle hooks by all HMS permit holders fishing for sharks recreationally, which the proposed rule defined as when using natural baits and using wire or heavy (200 lb or greater test) monofilament or fluorocarbon leaders. Based on public comment and updated analyses regarding dusky shark distribution, NMFS modified this measure in three ways: first, the final rule now specifies the type of circle hook required, which is non-offset, non-stainless steel circle hooks; second, the final rule now specifies that this measure only applies south of 41° 43' N latitude, which includes the geographic range of dusky sharks but does not apply the requirement to fishermen north of the dusky shark's range; and third, it now removes the gear-based definition of shark fishing. Under the modified measure, all HMS permitted fishermen within the specified geographic area who wish to fish for or retain sharks must use circle hooks, regardless of hook size or leader material, with limited exceptions when

fishing with artificial lures or flies. Artificial flies and lures were excluded because fishing with those gears are not likely to gut-hook sharks, the result that the measure is designed to avoid.

2. Shark endorsement requirement in the recreational shark fishery (§ 635.4(j)(4)). In the proposed rule, NMFS clearly indicated that fishermen could add the shark endorsement to their recreational permit at any time during the fishing year. As a result of public comment, in the final rule, NMFS is also allowing fishermen to remove the shark endorsement from their recreational permit at any time during the fishing year. Removal of the shark endorsement would mean that sharks could no longer be fished for, retained, or landed by persons aboard that vessel.

3. Dusky shark release methods in the pelagic longline fishery (§ 635.21(c)(6)(i)). NMFS proposed the requirement that fishermen with an Atlantic shark limited access permit with pelagic longline gear onboard must release all sharks not being retained using a dehooker or cutting the gangion less than three feet from the hook. During the public comment period, NMFS heard from some commercial fishermen that this requirement could raise safety at sea concerns because gangions can sometimes snap back and hit crew when the gangion is cut while under tension. In response, NMFS has slightly modified the requirement to specify that if the fisherman chooses to cut the gangion rather than use a dehooker, they should cut the gangion less than three feet from the hook, as safely as practicable.

4. Fleet communication and relocation protocol (§ 635.21(c)(6)(ii), (d)(2)(iii), and (g)(5)). NMFS proposed the requirement that fishermen with an Atlantic shark limited access permit using pelagic longline, bottom longline, or gillnet gear that catch a dusky shark must both broadcast the location of the dusky shark over the radio to other fishing vessels in the surrounding area and move at least 1 nmi from the reported location of the dusky shark catch.

As a result of public comment that questioned whether 1 nmi was far enough to effectively avoid a highly migratory species like dusky sharks, the final rule still specifies that vessels must move at least 1 nmi but encourages fishermen to move more than 1 nmi when appropriate given the local conditions as an additional precautionary measure. Additionally, in the regulations, NMFS has clarified that the requirement to broadcast the location of the dusky shark over the radio should be done as soon as practicable, whereas the proposed rule did not specify anything related to timing of the broadcast.

5. Workshop title clarification (§ 635.8(a)). In this final rule, NMFS clarifies that the name of a required workshop is “Safe Handling, Release, and Identification Workshop.” In the proposed rule, this workshop was erroneously titled the “Safe Handling, Release, Disentanglement, and Identification Workshop.” Although this correction was not included in the proposed rule, it is an administrative change and will not have any practical environmental, social, or economic impacts and is included for clarity to the regulated community.

Classification

The Assistant Administrator for Fisheries (AA) determined that Amendment 5b to the 2006 Consolidated HMS FMP is necessary for the conservation and management of Atlantic dusky sharks and that it is consistent with the Magnuson-Stevens Act and other applicable laws.

NMFS prepared an FEIS for Amendment 5b to the 2006 Consolidated HMS FMP. The FEIS was filed with the Environmental Protection Agency on February 17, 2017. A Notice of Availability was published on February 24, 2017 (82 FR 11574). In approving Amendment 5b to the 2006 Consolidated HMS FMP on March 28, 2017, NMFS issued a ROD identifying the selected alternatives. A copy of the ROD is available from the HMS Management Division (see **ADDRESSES**).

This final rule has been determined to be not significant under E.O. 12866.

Paperwork Reduction Act

This final rule contains a collection-of-information requirement subject to the Paperwork Reduction Act (PRA) that has been approved by OMB under control number 0648-0327. Public reporting burden for Atlantic HMS Permit Family of Forms is estimated to average 34 minutes per respondent for initial permit applicants, and 10 minutes for permit renewals, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding these burden estimates or any other aspect of this data collection, including suggestions for reducing the burden, to NMFS (see **ADDRESSES**) and by e-mail to *OIRA_Submission@omb.eop.gov*, or fax to 202-395-7285.

Notwithstanding any other provision of the law, no person is required to respond to, and no person shall be subject to penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB control number.

Summary of the Final Regulatory Flexibility Analysis

A final regulatory flexibility analysis (FRFA) was prepared for this rule. The FRFA incorporates the initial regulatory flexibility analysis (IRFA), a summary of the significant issues raised by the public comments in response to the IRFA, our responses to those comments, and a summary of the analyses completed to support the action. The full FRFA is available from NMFS (see **ADDRESSES**). A summary is provided below.

A. Statement of the Need for and Objectives of this Final Rule

Section 604(a)(1) of the Regulatory Flexibility Act (RFA) requires a succinct statement

of the need for and objectives of the rule. Chapter 1.0 of the Amendment 5b FEIS fully describes the need for and objectives of this final rule. In general, the objective of this final rule is to end overfishing of dusky sharks and to rebuild the stock in the timeframe recommended by the assessment update.

Under the Magnuson-Stevens Act, NMFS must, consistent with ten National Standards, manage fisheries to prevent overfishing while achieving, on a continuing basis, the optimum yield for each fishery. Additionally, any management measures must be consistent with other laws including, but not limited to, NEPA, the ESA, the MMPA, and the CZMA.

B. A Summary of the Significant Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analysis, a Summary of the Agency's Assessment of Such Issues, and a Statement of Any Changes Made in the Rule as a Result of Such Comments

Section 604(a)(2) of the RFA requires a summary of the significant issues raised by the public comments in response to the IRFA, a summary of the assessment of the Agency of such issues, and a statement of any changes made in the rule as a result of such comments. Section 604(a)(3) of the RFA requires a response to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration in response to the proposed rule, and a statement of any changes made to the proposed rule as a result of the comments. NMFS received many comments on the proposed rule and DEIS during the public comment period. Summarized public comments and the Agency's responses to them, including changes as a result of public comment, are included above. The general economic concerns raised can be found in comments 33, 41, 44, 53, and 63. NMFS did not receive comments specifically on the IRFA. NMFS did not receive any comments filed from the Chief Council for Advocacy in response to the proposed rule.

C. A Description and an Estimate of the Number of Small Entities to Which the Final Rule Would Apply

Section 604(a)(4) of the RFA requires a description and estimate of the number of small entities to which the final rule would apply. For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of \$11 million for all its affiliated operations worldwide. The Small Business Administration (SBA) has established size standards for all other major industry sectors in the U.S., including the scenic and sightseeing transportation (water) sector (NAICS code 487210, for-hire), which includes charter/party boat entities. The Small Business Administration (SBA) has defined a small charter/party boat entity as one with average annual receipts (revenue) of less than \$7.5 million.

This final rule is expected to directly affect commercial pelagic longline, bottom longline, shark gillnet, and recreational shark fishing vessels that possess HMS permits and are actively fishing. For the pelagic longline vessels, these are vessels that possess an Atlantic shark limited access permit, an Atlantic swordfish limited access permit, and an Atlantic Tunas Longline category permit. Because pelagic longline fishermen must hold all three permits in order to fish, for the purposes of this discussion, NMFS will focus on Atlantic Tunas Longline category permit holders. Regarding those entities that would be directly affected by the preferred commercial management measures, the average annual revenue per active pelagic longline vessel is estimated to be \$187,000 based on the 170 active vessels between 2006 and 2012 that produced

an estimated \$31.8 million in revenue annually. The maximum annual revenue for any pelagic longline vessel between 2006 and 2015 was less than \$1.9 million, well below the NMFS small business size standard for commercial fishing businesses of \$11 million. Other non-longline HMS commercial fishing vessels typically generally earn less revenue than pelagic longline vessels. Therefore, NMFS considers all Atlantic HMS commercial permit holders to be small entities (i.e., they are engaged in the business of fish harvesting, are independently owned or operated, are not dominant in their field of operation, and have combined annual receipts not in excess of \$11 million for all its affiliated operations worldwide). The preferred commercial alternatives would apply to the 280 Atlantic tunas Longline category permit holders and 224 directed shark permit holders. Of these 280 permit holders, 136 have Individual Bluefin Quotas (IBQ) shares, although all properly permitted vessels may lease quota through the IBQ system to go commercial pelagic longline fishing.

For the recreational management measures, most commonly, the preferred management measures would only directly apply to small entities that are Charter/Headboat permit holders that provide for-hire trips that target or retain sharks. Other HMS recreational fishing permit holders are considered individuals, not small entities for purposes of the RFA because they are not engaged in commercial fishing. Additionally, while Atlantic Tunas General category and Swordfish General commercial permit holders hold commercial permits and are usually considered small entities, the preferred management measures would only affect them when they are fishing under the recreational regulations for sharks during a registered tournament, and NMFS is not considering them small entities for this rule because they are not engaged in commercial activity during those tournaments.

Vessels with the HMS Charter/Headboat category permit are for-hire vessels. These

permit holders can be regarded as small entities for RFA purposes (i.e., they are engaged in the business of fish harvesting, are independently owned or operated, are not dominant in their field of operation, and have average annual revenues of less than \$7.5 million). Overall, the recreational alternatives would impact the portion of the 3,596 HMS Charter/Headboat permit holders who fish for or retain sharks.

NMFS has determined that the measures in Amendment 5b will not likely directly affect any small organizations or small government jurisdictions defined under RFA, nor will there be disproportionate economic impacts between large and small entities. Furthermore, there will be no disproportionate economic impacts among the universe of vessels based on gear, home port, or vessel length.

More information regarding the description of the fisheries affected, and the categories and number of permit holders, can be found in Chapter 3.0 of the Amendment 5b FEIS.

D. Description of the Projected Reporting, Record-Keeping, and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes of Small Entities Which Would Be Subject to the Requirements of the Report or Record

Section 604(a)(5) of the RFA requires Agencies to describe any new reporting, record-keeping, and other compliance requirements. One of the measures in Amendment 5b will result in reporting, record-keeping, and compliance requirements that may require new Paperwork Reduction Act (PRA) filings and two of the measures would modify compliance requirements. NMFS estimates that the number of small entities that would be subject to these requirements would include the Atlantic tuna Longline category (280), Directed and Incidental Shark Limited Access (224 and 275, respectively), and HMS Charter/Headboat category (3,596) permit holders.

Recreational Alternatives

Alternative A2 will require recreational fishermen targeting shark to obtain a shark endorsement in addition to other existing permit requirements. Obtaining the shark endorsement will be included in the online HMS permit application and renewal processes and will require the applicant to complete a quiz focusing on shark species identification. The applicant will simply need to indicate the desire to obtain the shark endorsement after which he or she will be directed to an online quiz that will take minimal time to complete. Adding the endorsement to the permit and requiring applicants to take the online quiz to obtain the endorsement will require a modification to the existing PRA for the permits.

Commercial Measures Alternatives

Alternative B5 will require completion of shark identification and fishing regulation training as a new part of the Safe Handling and Release Workshops for HMS pelagic longline, bottom longline, and shark gillnet vessel owners and operators that they are already required to take on a 3-year basis. The training course will provide information regarding shark identification and regulations, as well as best practices to avoid interacting with dusky sharks and how to minimize mortality of dusky sharks caught as bycatch. Compliance with this course requirement will be mandatory as a condition for permit renewal. Certificates will be issued to all commercial pelagic longline, bottom longline, and gillnet vessel owners and operators indicating compliance with this requirement, and the certificates will be required for permit renewal.

Alternative B6 will require that all vessels with an Atlantic shark commercial permit and fishing with pelagic longline, bottom longline, or shark gillnet gear abide by a dusky shark fleet communication and relocation protocol. The protocol will require vessels to report the location of dusky shark interactions over the radio as soon as practicable to other pelagic longline, bottom

longline, or shark gillnet vessels in the area and that subsequent fishing sets on that fishing trip could be no closer than 1 nautical mile (nm) from where the encounter took place.

E. Description of the Steps the Agency Has Taken to Minimize the Significant Economic Impact on Small Entities Consistent with the Stated Objectives of Applicable Statutes, Including a Statement of the Factual, Policy, and Legal Reasons for Selecting the Alternative Adopted in the Final Rule and the Reason That Each one of the Other Significant Alternatives to the Rule Considered by the Agency Which Affect Small Entities Was Rejected

Section 604(a)(6) of the RFA requires Agencies to describe any alternatives to the preferred alternatives which accomplish the stated objectives and which minimize any significant economic impacts. The implementation of this action should not result in significant adverse economic impacts to individual vessels. These impacts are discussed below and in Chapter 4.0 of the FEIS. Additionally, the Regulatory Flexibility Act (5 U.S.C. 603 (c)(1)-(4)) lists four general categories of “significant” alternatives that would assist an agency in the development of significant alternatives. These categories of alternatives are: 1) establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; 2) clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; 3) use of performance rather than design standards; and, 4) exemptions from coverage of the rule for small entities.

In order to meet the objectives of this amendment, consistent with all legal requirements, NMFS cannot exempt small entities or change the reporting requirements only for small entities because all the entities affected are considered small entities. Thus, there are no alternatives discussed that fall under the first and fourth categories described above. Under the third category, “use of performance rather than design standards,” NMFS considers Alternative B5,

which will provide additional training to pelagic longline, bottom longline, and shark gillnet fishermen, to be a performance standard rather than a design standard. As described below, NMFS analyzed several different alternatives in this proposed rulemaking and provides the rationale for identifying the preferred alternative to achieve the desired objective.

In this rulemaking, NMFS considered two different categories of alternatives. The first category, recreational alternatives, covers seven main alternatives that address various strategies of reducing dusky shark mortality in the recreational fishery. The second category of alternatives, commercial measures, considers nine main alternatives that address various strategies of reducing dusky shark mortality in the commercial fishery.

The potential impacts these alternatives may have on small entities have been analyzed and are discussed in the following sections. The preferred alternatives include: Alternative A2, Alternative A6d, Alternative B3, Alternative B5, Alternative B6, and Alternative B9. The economic impacts that would occur under these preferred alternatives were compared with the other alternatives to determine if economic impacts to small entities could be minimized while still accomplishing the stated objectives of this rule.

1. Recreational Alternatives

Alternative A1

Alternative A1, the no action alternative, would not implement any management measures in the recreational shark fishery to decrease mortality of dusky sharks, likely resulting in direct, short- and long-term neutral economic impacts. Because there would be no changes to the fishing requirements, there would be no economic impacts on small entities. If more restrictive measures are required in the long-term under MSA or other statutes such as the Endangered Species Act, moderate adverse economic impacts may occur. However, overfishing

would continue under this alternative, thus, NMFS does not prefer this alternative at this time.

Alternative A2 - Preferred Alternative

Under Alternative A2, a preferred alternative, HMS Angling and Charter/Headboat permit holders would be required to obtain a shark endorsement, which requires completion of a short online shark identification and fishing regulation training course in order to retain sharks. Obtaining the shark endorsement would be included in the online HMS permit application and renewal processes and would require the applicant to complete a training course focusing on shark species identification and fishing regulations. This alternative would likely result in no substantive economic impacts because there would be no additional cost to the applicant and only a small additional investment in time. Obtaining the shark endorsement would be a part of the normal HMS permit application or renewal. The applicant would simply need to indicate the desire to obtain the shark endorsement after which he or she would be directed to a short online training course that would take minimal time to complete. The goal of the training course is to help prevent anglers from landing prohibited or undersized sharks, and thus, help rebuild stocks. Furthermore, the list of shark endorsement holders would allow for more targeted surveys and outreach, likely increasing the reliability of recreational shark catch estimates. This preferred alternative helps achieve the objectives of this rule while minimizing any significant economic impacts on small entities.

Alternative A3

Alternative A3 would have required participants in the recreational shark fishery (Angling and Charter/Headboat permit holders) to carry an approved shark identification placard on board the vessel when fishing for sharks. This alternative would likely result in short- and long-term minor economic impacts. The cost of obtaining a placard, whether by obtaining a pre-

printed one or self-printing, would be modest. To comply with the requirement of this alternative, the angler would need to keep the placard on board the vessel when fishing for sharks and, because carrying other documents such as permits and boat registration is already required, this is unlikely to be a large inconvenience. This alternative would have slightly more economic impacts than Alternative A2 on small entities and would likely be less effective than the training course in Alternative A2.

Alternative A4

Under Alternative A4, NMFS would extend the prohibition on the retention of ridgeback sharks to include the rest of the ridgeback sharks, namely oceanic whitetip, tiger sharks, and smoothhound sharks, all of which are currently allowed to be retained by recreational shark fishermen (HMS Angling and Charter/Headboat permit holders). While this alternative would simplify compliance for the majority of fishermen targeting sharks, it could also potentially have adverse economic impacts for a small subset of fishermen that target oceanic whitetip, tiger, and smoothhound sharks. These adverse impacts would be quite small, however, for oceanic whitetip and tiger sharks. However, based on MRIP data, this alternative could have considerable impacts on fishermen targeting smoothhound sharks. Presumably, state-permitted anglers that do not hold an HMS federal permit are responsible for some of the catch and, for species such as smooth dogfish that are often found almost exclusively in state waters, anglers with only state permit may be responsible for most of the catch. Recreational fishermen with only state-issued permits would still be able to retain smoothhound sharks (those that hold an HMS permit must abide by federal regulations, even in state waters). Thus, Alternative A4 would likely result in both direct short- and long-term, minor adverse economic impacts on HMS Charter/Headboat operators if prohibiting landing of additional shark species reduces demand for

fishing charters. While this alternative may have greater economic impacts than Alternative A3, it may be effective at achieving the objective of reducing dusky shark mortality in the recreational fishery.

Alternative A5

Under Alternative A5, the minimum recreational size limit for authorized shark species, except for Atlantic sharpnose, bonnethead, and hammerhead (great, scalloped, and smooth) sharks, would increase from 54 to 89 inches fork length. Under this alternative, increasing the recreational size limit would likely result in both direct short- and long-term, moderate adverse economic impacts for recreational fishermen, charter/headboat operators, and tournament operators. Because many shark species have a maximum size below an 89-inch size limit, there could be reduced incentive to fish recreationally for sharks due to the decreased potential to legally land these fish. Increasing the minimum size for retention would also impact the way that tournaments and charter vessels operate. While the impacts of an 89-inch fork length minimum size on tournaments awarding points for pelagic sharks may be lessened because these tournament participants target larger sharks, such as shortfin mako, blue, and thresher, that grow to larger than 89 inches fork length, this may not be the case for tournaments targeting smaller sharks. Tournaments that target smaller sharks, especially those that target shark species that do not reach sizes exceeding 89 inches fork length such as blacktip sharks, may be heavily impacted by this alternative. Reduced participation in such tournaments could potentially decrease the amount of monetary prizes offered to winners. Thus, implementation of this management measure could significantly alter the way some tournaments and charter vessels operate, or reduce opportunities to fish for sharks and drastically reduce general interest and demand for recreational shark fishing, which could create adverse economic impacts. For the

aforementioned reasons, NMFS does not prefer this alternative at this time.

Alternative A6

Under Alternative A6, circle hooks would be required for either all HMS permit holders fishing recreationally for sharks and all Atlantic HMS permit holders participating in fishing tournaments when targeting or retaining Atlantic sharks.

Alternative A6a

Sub-alternative A6a would require the use of circle hooks by HMS permit holders with a shark endorsement whenever fishing with natural bait and wire or (200-pound test or greater) monofilament or fluorocarbon leader. Relative to the total cost of gear and tackle for a typical fishing trip, the cost associated with switching from J hooks to circle hooks is negligible. Thus, the immediate cost in switching hook type is likely minimal. However, there is conflicting indication that the use of circle hooks may reduce or increase CPUE resulting in lower catch of target species. In the event that CPUE is reduced, some recreational fishermen may choose not to fish for sharks or to enter tournaments that offer awards for sharks. Additionally, this alternative would also effectively require HMS permit holders with shark endorsements to use circle hooks when fishing for many non-shark species because wire and heavy monofilament leaders are commonly also used when fishing for swordfish, billfish, tuna, wahoo, mackerel, and other marine species. These missed recreational fishing opportunities could result in minor adverse economic impacts in the short- and long-term. Given the effects this alternative would have on HMS permit holders while targeting non-shark species, NMFS does not prefer this alternative at this time.

Alternative A6b

Sub-Alternative Ab6 is similar to A6a, but instead of requiring circle hooks when

deploying natural bait while using a wire or heavy (200-pound test or greater) monofilament or fluorocarbon leader outside of a fishing tournament, it instead requires circle hooks when deploying a 5/0 or greater size hook to fish with natural bait outside of a fishing tournament. This use of the hook size standard to determine if the trip could be targeting sharks may result in more recreational trips requiring circle hooks than under alternative A6a, but many more of those trips might actually not be targeting sharks, but instead other large pelagic fish. The use of a heavy leader would be more correlated with angling activity that is targeting sharks.

Alternative A6c

Sub-Alternative A6c is similar to A6a and A6b, but restricted to requiring the use of circle hooks by all HMS permit holders participating in fishing tournaments that bestow points, prizes, or awards for sharks. This alternative would impact a smaller universe of recreational fishermen, so the adverse impacts are smaller. However, given the limited scope of this requirement, the benefits to reducing dusky shark mortality via the use of circle hooks are also more limited.

Alternative A6d – Preferred Alternative

Sub-Alternative A6d, a preferred alternative, is a new alternative similar to the above sub-alternatives that was formulated based in response to numerous public comments regarding the previously preferred alternative A6a. A6d would require the use of non-offset, non-stainless steel circle hooks by all HMS permit holders with a shark endorsement when fishing for sharks recreationally south of 41° 43' N latitude, except when fishing with flies or artificial lures. On the one hand, this alternative would have less impact on HMS permit holders as it would limit the circle hook requirement to only those trips in which sharks are the target species, and would limit the requirement to waters south of Cape Cod so that it does not affect HMS permit holders

fishing outside the dusky sharks known range. On the other hand, it would likely affect more HMS permit holders south of Cape Cod as fewer permit holders would be discouraged from acquiring the shark endorsement to avoid the circle hook requirement when fishing with wire or heavy monofilament or fluorocarbon leaders for non-shark species. Overall, the new alternative A6d is expected to have minor adverse economic impacts in the short- and long-term. However, A6d is the preferred alternative as it would restrict impacts to recreational fishing trips targeting sharks within the range of the dusky shark, and minimize unintended impacts that are not needed to meet the objectives of this rulemaking.

Alternative A7

Alternative A7 would prohibit HMS permit holders from retaining any shark species. Recreational fishermen may still fish for and target authorized shark species for catch and release. The large number of fishermen who already practice catch and release and the catch and release shark fishing tournaments currently operating would not be impacted. However, prohibiting retention of sharks could have major impacts on fishing behaviors and activity of other recreational shark fishermen and reduce their demand for charter/headboat trips. Only allowing catch and release of authorized sharks in the recreational fishery could impact some fishermen that retain sharks recreationally and tournaments that award points for landing sharks. Thus, prohibiting retention of Atlantic sharks in the recreational shark fisheries could drastically alter the nature of recreational shark fishing and reduce incentives to fish for sharks. Additionally, with reduced incentive to fish for sharks, this could negatively impact profits for the HMS Charter/Headboat industry. Because there could be major impacts to the recreational shark fisheries from this management measure, Alternative A7 would likely have direct short- and long-term, moderate adverse economic impacts on small business entities.

2. Commercial Alternatives

Alternative B1

Under Alternative B1, NMFS would not implement any measures to reduce dusky shark mortality in the commercial shark or HMS fisheries. Because no management measures would be implemented under this alternative, NMFS would expect fishing practices to remain the same and economic impacts to be neutral in the short-term. Dusky sharks are a prohibited species and fishermen are not allowed to harvest this species. Thus, even if dusky sharks continue to experience overfishing and the abundance declines as a result of this alternative, there would not be any economic impacts on the fishery in the short-term. If more restrictive measures are required in the long-term under MSA or other statutes such as the Endangered Species Act, moderate adverse economic impacts may occur.

Alternative B2

Under Alternative B2, HMS commercial fishermen would be limited to 750 hooks per pelagic longline set with no more than 800 assembled gangions onboard the vessel at any time. Based on average number of hooks per pelagic longline set data, the hook restriction in this alternative could have neutral economic impacts on fishermen targeting bigeye tuna, mixed tuna species, and mixed HMS species, because the average number of hooks used on pelagic longline sets targeting these species is slightly above or below the limit considered in this alternative. This alternative would likely have adverse economic impacts on fishermen targeting dolphin fish, because these fishermen on average use 1,056 hooks per set. If NMFS implemented this alternative, fishermen targeting dolphin fish with pelagic longline gear would have to reduce their number of hooks by approximately 30 percent per set, which may result in a similar percent reduction in set revenue or could result in increased operating costs if fishermen decide to offset

the limited number of hooks with more fishing sets. Overall, Alternative B2 would be expected to have short- and long-term minor adverse economic impacts on the pelagic longline fishery.

Alternative B3 - Preferred Alternative

Under Alternative B3, a preferred alternative, HMS commercial fishermen must release all sharks that are not being boarded or retained by using a dehooker, or by cutting the gangion no more than three feet from the hook. This alternative would have neutral to adverse economic impacts on commercial shark fishermen using pelagic longline gear. Currently, fishermen are required to use a dehooking device if a protected species is caught. This alternative would require this procedure to be used on all sharks that would not be retained, or fishermen would have to cut the gangion to release the shark. Currently, it is common practice in the pelagic longline fishery to release sharks that are not going to be retained (especially larger sharks) by cutting the gangion, but they usually do not cut the gangion so only 3 feet remain, so there might be a slight learning curve. Using a dehooker to release sharks in the pelagic longline fishery is a less common practice, therefore, there may be more of a learning curve that would make using this technique more time consuming and making fishing operations less efficient. Although this may be an initial issue, NMFS expects that these inefficiencies would be minimal and that fishermen would become adept in using a dehooker to release sharks over time given they are all adept at using a dehooker to release protected species. Thus, Alternative B3 would be expected to have short- and long-term neutral economic impacts on the pelagic longline fishery.

Alternative B4

Under Alternative B4, NMFS considered various dusky shark hotspot closures for vessels fishing with pelagic longline gear. The hotspot closures considered are the same areas that were analyzed in Draft Amendment 5 and the A5b Predraft. These hotspot closure alternatives are

located where increased levels of pelagic longline interactions with dusky sharks had been identified based on HMS Logbook data. During the months that hotspot closures are effective, Atlantic shark commercial permit holders (directed or incidental) would not be able to fish with pelagic longline gear in these areas.

Alternative B4a

This alternative would define a rectangular area in a portion of the existing Charleston Bump time/area closure area, and prohibit the use of pelagic longline gear by all vessels during the month of May in that area. This alternative is expected to have moderate short and long-term direct adverse economic impacts on 46 vessels that have historically fished in this Charleston Bump area during the month of May. This closure would result in the loss of approximately \$15,250 in gross revenues per year per vessel assuming no redistribution of effort outside of the closed area.

However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. Based on natural breaks in the percentage of sets vessels made inside and outside of this alternative's hotspot closure area, NMFS estimated that if a vessel historically made less than 40 percent of its sets in the hotspot closure area, it would likely redistribute all of its effort. If a vessel made more than 40 percent but less than 75 percent of its sets in the hotspot closure area, it would likely redistribute 50 percent of its effort impacted by the hotspot closure area to other areas. Finally, if a vessel made more than 75 percent of its sets solely within the hotspot closure area, NMFS assumed the vessel would not likely shift its effort to other areas. Based on these individually calculated redistribution rates, the percentage of fishing in other areas during the gear restriction time period, the percentage of fishing in other areas during the hotspot closure time period, and the

catch per unit effort for each vessel in each statistical area, NMFS estimated the potential landings associated with redistributed effort associated with fishing sets displaced by the hotspot closure area. The net loss in fishing revenues as a result of the Charleston Bump Hotspot May closure after considering likely redistribution of effort is estimated to be \$8,300 per vessel per year. Alternative B4a would result in moderate short- and long-term adverse economic impacts as a result of restricting pelagic longline vessels from fishing in the Charleston Bump Hotspot May area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4b

This alternative would prohibit the use of pelagic longline gear in the vicinity of the “Hatteras Shelf” area of the Cape Hatteras Special Research Area during the month of May where elevated levels of dusky shark interactions have been reported. This alternative is expected to have moderate short and long-term direct adverse economic impacts on 42 vessels that have historically fished in this Hatteras Shelf Hotspot area during the month of May. The average annual revenue per vessel from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$9,980 during the month of May, assuming that fishing effort does not move to other areas. However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Hatteras Shelf Hotspot May closure on fishing revenues after considering likely redistribution of effort is estimated to be \$5,990 per vessel per year. Alternative B4b would result in moderate adverse economic impacts as a result of restricting pelagic longline vessels from fishing in the Hatteras Shelf Hotspot May area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators

redistribute their effort.

Alternative B4c

This alternative would prohibit the use of pelagic longline gear in the vicinity of the “Hatteras Shelf” area of the Cape Hatteras Special Research Area during the month of June where elevated levels of dusky shark interactions have been reported.

This alternative is expected to have moderate short and long-term direct adverse economic impacts on 37 vessels that have historically fished in this Hatteras Shelf Hotspot area during the month of June. The average annual revenue from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$7,640 per vessel during the month of June, assuming that fishing effort does not move to other areas. However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Hatteras Shelf Hotspot June closure on fishing revenues after considering likely redistribution of effort is estimated to be \$4,010 per vessel per year. Alternative B4c would result in moderate adverse economic impacts as a result of restricting pelagic longline vessels from fishing in the Hatteras Shelf Hotspot June area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4d

This alternative would prohibit the use of pelagic longline gear in the vicinity of the “Hatteras Shelf” area of the Cape Hatteras Special Research Area during the month of November where elevated levels of dusky shark interactions have been reported. This alternative is expected to have minor short and long-term direct adverse economic impacts on 23 vessels that have historically fished in this Hatteras Shelf Hotspot area during the month of November. The

average annual revenue from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$5,230 per vessel during the month of November, assuming that fishing effort does not move to other areas. However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Hatteras Shelf Hotspot November closure on fishing revenues after considering likely redistribution of effort is estimated to be \$3,540 per vessel per year.

Alternative B4d would result in minor adverse economic impacts as a result of restricting pelagic longline vessels from fishing in the Hatteras Shelf Hotspot November area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4e

This alternative would prohibit the use of pelagic longline gear by all U.S. flagged-vessels permitted to fish for HMS in the three distinct closures in the vicinity of the Mid-Atlantic Canyons during the month of October where elevated levels of dusky shark interactions have been reported. This alternative is expected to have moderate short and long-term direct adverse economic impacts on 64 vessels that have historically fished in this Canyons Hotspot October area. The average annual revenue from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$9,950 per vessel during the month of October, assuming that fishing effort does not move to other areas. However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Canyons Hotspot October closure on fishing revenues after considering likely redistribution of effort is estimated to be \$3,720 per vessel per year.

Alternative B4e would result in moderate adverse economic impacts as a result of restricting

pelagic longline vessels from fishing in the Canyons Hotspot October area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4f

This alternative would prohibit the use of pelagic longline gear by all U.S. flagged-vessels permitted to fish for HMS in July in an area adjacent to the existing Northeastern U.S. closure which is currently effective for the month of June, where elevated levels of dusky shark interactions have been reported. This alternative is expected to have moderate short and long-term direct adverse economic impacts on 35 vessels that have historically fished in this Southern Georges Banks Hotspot area during the month of July. The average annual revenue from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$14,230 per vessel during the month of July, assuming that fishing effort does not move to other areas. However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Southern Georges Banks Hotspot July closure on fishing revenues after considering likely redistribution of effort is estimated to be \$8,290 per vessel per year. Alternative B4f would result in moderate adverse economic impacts as a result of restricting longline vessels from fishing in the Southern Georges Banks Hotspot July area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4g

This alternative would prohibit the use of pelagic longline gear by all U.S. flagged-vessels permitted to fish for HMS in August in an area adjacent to the existing Northeastern U.S.

closure, which is currently effective for the month of June, where elevated levels of dusky shark interactions have been reported. This alternative is expected to have moderate short and long-term direct adverse economic impacts on 35 vessels that have historically fished in this Southern Georges Banks Hotspot area during the month of August. The average annual revenue from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$12,260 per vessel during the month of August, assuming that fishing effort does not move to other areas. However, it is likely that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Southern Georges Banks Hotspot August closure on fishing revenues after considering likely redistribution of effort is estimated to be \$5,990 per vessel per year. Alternative B4g would result in moderate adverse economic impacts as a result of restricting pelagic longline vessels from fishing in the Southern Georges Banks Hotspot August area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4h

This alternative would prohibit the use of pelagic longline gear by all U.S. flagged-vessels permitted to fish for HMS in a portion of the existing Charleston Bump time/area closure during the month of November where elevated levels of dusky shark interactions have been reported. This alternative is expected to have minor short and long-term direct adverse economic impacts on 32 vessels that have historically fished in this Charleston Bump Hotspot area during the month of November. The average annual revenue from 2008 through 2014 from all fishing sets made in this hotspot closure area has been approximately \$7,030 per vessel during the month of November, assuming that fishing effort does not move to other areas. However, it is likely

that some of the vessels that would be impacted by this hotspot closure would redistribute their effort to other fishing areas. The net impact of the Charleston Bump Hotspot November closure on fishing revenues after considering likely redistribution of effort is estimated to be \$2,720 per vessel per year. Alternative B4h would result in minor adverse social and economic impacts as a result of restricting pelagic longline vessels from fishing in the Charleston Bump Hotspot November area, thus causing decreased revenues and increased costs associated with fishing in potentially more distant waters if vessel operators redistribute their effort.

Alternative B4i

This alternative would provide strong incentives to avoid dusky sharks and to reduce interactions by modifying fishing behavior. Participants in the pelagic longline fleet have requested increased individual accountability within the fishery in light of several management issues facing the fishery (e.g., bluefin tuna, dusky sharks). NMFS first developed the use of conditional access under Draft Amendment 7, in part due to the public comments and feedback received regarding the original dusky hotspot closures proposed in Draft Amendment 5. This approach would address the fact that, according to HMS logbook data, relatively few vessels have consistently accounted for the majority of the dusky shark interactions. Conditional access would not impact the entire fleet for interactions made by a relatively small proportion of vessels. Therefore, depending on the metrics selected and fishery participant behavior, this alternative could have adverse socioeconomic effects on certain vessels that are both poor avoiders of dusky sharks and are non-compliant with the regulations. NMFS would analyze the socioeconomic impact by using similar fishing effort redistribution proposed in Draft Amendment 7. Overall, the adverse socioeconomic effects of dusky shark hotspot closures are expected to be less if a conditional access alternative is implemented because some vessels

would still be able to access and fish the hotspot closures. This alternative would have neutral to beneficial effects for vessels that are still authorized to fish in these regions, as they would not be held accountable for the behavior of other individuals and would not have to change their current fishing operations.

Alternative B4j

This alternative would implement bycatch caps on dusky shark interactions in hotspot areas. Under this alternative, NMFS would allow pelagic longline vessels limited access to high dusky shark interaction areas with an observer onboard while limiting the number of dusky shark interactions that could occur in these areas. Once the dusky shark bycatch cap for an area is reached, that area would close until the end of the three-year bycatch cap period. This alternative could lead to adverse economic impacts by reducing annual revenue from fishing in the various hot spot areas depending on the number of hotspots where bycatch cap limits are reached, the timing of those potential closures during the year, and the amount of effort redistribution that occurs after the closures. In addition to direct impacts to vessels owners, operators, and crew members, this alternative would have moderate, adverse indirect impacts in the short and long-term on fish dealers, processors, bait/gear suppliers, and other shore-based businesses impacted by reduced fishing opportunities for pelagic longline vessel owners that would have fished in the hotspot area.

Alternative B5 - Preferred Alternative

Alternative B5, a preferred alternative, would provide additional training to pelagic longline, bottom longline, and shark gillnet vessel owners and operators as a new part of all Safe Handling and Release Workshops. The course would be taught in conjunction with the current Protected Species Safe Handling, Release, and Identification workshops that HMS pelagic

longline, bottom longline, and shark gillnet vessel owners and operators are already required to attend. The training course would provide information regarding shark identification and regulations, as well as best practices to avoid interacting with dusky sharks and how to minimize mortality of dusky sharks caught as bycatch. This training course would provide targeted outreach on dusky shark identification and regulations, which should decrease interactions with dusky sharks. This alternative would have neutral economic impacts because the fishermen are already required to attend a workshop, incur some travel costs, and would not be fishing while taking attending the workshop. Given the neutral economic impacts and this alternative's potential to decrease dusky interactions and mortality, NMFS prefers this alternative.

Alternative B6 - Preferred Alternative

The economic impacts associated with Alternative B6, which would increase dusky shark outreach and awareness through development of additional commercial fishery outreach materials and establish a communication and fishing set relocation protocol for HMS commercial fishermen following interactions with dusky sharks and increase outreach to the pelagic longline fleet, are anticipated to be neutral. These requirements would not cause a substantial change to current fishing operations, but have the potential to help fishermen become more adept in avoiding dusky sharks. If fishermen become better at avoiding dusky sharks, there is the possibility that target catch could increase. On the other hand, the requirement to move the subsequent fishing set one nautical mile from where a previous dusky shark interaction occurred could move fishermen away from areas where they would prefer to fish and it could increase fuel usage and fuel costs. Given the neutral economic impacts of this alternative and its expectation to decrease dusky shark interactions, NMFS prefers this alternative.

Alternative B7

NMFS would seek, through collaboration with the affected states and the ASMFC, to extend the end date of the existing state shark closure from July 15 to July 31. Currently, the states of Virginia, Maryland, Delaware, and New Jersey have a state-water commercial shark closure from May 15 to July 15. In 2014, 621 lb dw of aggregated LCS and 669 lb dw of hammerhead sharks were landed by commercial fishermen in Virginia, Maryland, and New Jersey from July 15 to July 31. Based on 2014 ex-vessel prices, the annual gross revenues loss for aggregated LCS and hammerhead shark meat to the regional fleet in revenues due to an extended closure date would be \$847, while the shark fins would be \$207. Thus the total loss annual gross revenue for aggregated LCS and hammerhead sharks would be \$1,054. Extending this closure by 16 days could cause a reduction of commercial fishing opportunity, likely resulting in minor adverse economic impacts due to reduced opportunities to harvest aggregated LCS and hammerhead sharks. In the long-term, this reduction would be neutral since fishermen would be able to adapt to the new opening date.

Alternative B8

Under Alternative B8, NMFS would remove pelagic longline gear as an authorized gear for Atlantic HMS. All commercial fishing with pelagic longline gear for HMS in the Atlantic, Gulf of Mexico, and Caribbean would be prohibited. This would greatly reduce fishing opportunities for pelagic longline fishing vessel owners. Prohibiting the use of pelagic longline fishing gear would result in direct and indirect, major adverse economic impacts in the short and long-term for pelagic longline vessel owners, operators, and crew.

Between 2008 and 2014, 168 different vessels reported using pelagic longline fishing gear in Atlantic HMS Logbooks. Average annual revenues were estimated to be approximately \$34,322,983 per year based on HMS logbook records, bluefin tuna dealer reports, and the

eDealer database. In 2014, there were 110 active pelagic longline vessels which produced approximately \$33,293,118 in revenues. The 2014 landings value is in line with the 2008 to 2014 average. Therefore, NMFS expects future revenues forgone revenue on a per vessel basis to be approximately \$309,000 per year based on 110 vessels generating an estimated \$34 million in revenues per year. This displacement of fishery revenues would likely cause business closures for a majority of these pelagic longline vessel owners. Given the magnitude of the economic impact of this alternative, it is not a preferred alternative.

Alternative B9 - Preferred Alternative

Under Alternative B9, NMFS would require the use of circle hooks by all HMS directed shark permit holders in the bottom longline fishery. This requirement is expected to reduce the mortality associated with catch of dusky shark in the bottom longline fishery.

There is negligible cost associated with switch from J-hooks to circle hooks. However, there is some indication that the use of circle hooks may reduce catch per unit effort (CPUE) resulting in lower catch of target species. To the extent that CPUE is reduced, some commercial fishermen using BLL gear may experience reduced landings and associated revenue with the use of circle hooks. This alternative would require the 224 vessels that hold a shark directed limited access permit as of 2015 to use circle hooks. However, 104 of the 224 vessels have an Atlantic tunas longline permit, which requires fishermen to use circle hooks with pelagic longline gear. Thus, those vessels would already possess and use circle hooks. The remaining 120 permit holders would be required to use circle hooks when using bottom longline gear. Given the low switching costs from J-hooks to circle hooks and the potential to reduce dusky shark mortality, NMFS prefers this alternative.

Alternative B10

Under this alternative, NMFS would annually allocate a certain number of allowable dusky shark interactions to each individual shark directed or incidental limited access permit holder in the HMS pelagic and bottom longline fisheries. These allocations would be transferable between permit holders. When each vessel's individual dusky shark bycatch quota (IDQ) is reached, the vessel would no longer be authorized to fish for HMS for the remainder of the year. The concept of this alternative is similar to the Individual Bluefin Tuna Quota (IBQ) Program implemented in Amendment 7 to the 2006 Consolidated HMS FMP (79 FR 71510), which established individual quotas for bluefin tuna bycatch in the pelagic longline fishery and authorized retention and sale of such bycatch. We would not, however, anticipate authorizing retention and sale of dusky sharks, because they remain a prohibited species.

The goal of this alternative would be to provide strong individual incentives to reduce dusky shark interactions while providing flexibility for vessels to continue to operate in the fishery, however, several unique issues associated with dusky sharks would make these goals difficult to achieve.

In order to achieve the mortality reductions based upon the 2016 SEDAR 21 dusky shark assessment update, the number of dusky shark interactions may need to be substantially reduced. NMFS expects the allocations to each vessel may be extremely low and highly inaccurate/uncertain. It is not clear that an IDQ system without a supportable scientific basis would actually reduce interactions with dusky sharks. To the extent that any reduction actually occurred, some vessels would be constrained by the amount of individual quota they are allocated and this could reduce their annual revenue. If a pelagic longline vessel interacts with dusky sharks early in the year and uses their full IDQ allocation, they may be unable to continue fishing with pelagic longline or bottom longline gear for the rest of the year if they are unable to

lease quota from other IDQ holders. This would result in reduced revenues and potential cash flow issues for these small businesses.

If vessel owners are only allocated a very low amount of IDQ, it is very unlikely that an active trading market for IDQs will emerge. The initial allocations could be insufficient for many vessels to maintain their current levels of fishing activity and they may not be able to find IDQs to lease or have insufficient capital to lease a sufficient amount of IDQs. Some vessel owners may view the risk of exceeding their IDQ allocations and the associated costs of acquiring additional quota to outweigh the potential profit from fishing, so they may opt to not continue participating in the fishery.

The annual transaction costs associated with matching lessor and lessees, the costs associated with drafting agreements, and the uncertainty vessel owners would face regarding quota availability would reduce some of the economic benefits associated with leasing quota and fishing.

There would also be increased costs associated with bottom longline vessels obtaining and installing EM and VMS units. Some bottom longline vessel owners might have to consider obtaining new vessels if their current vessels cannot be equipped with EM and VMS. There would be increased costs associated with VMS reporting of dusky interactions. Some fishermen would also need to ship EM hard drives after each trip and they may need to consider acquiring extra hard drives to avoid not having one available when they want to go on a subsequent trip.

Given the challenges in properly identifying dusky sharks, every shark would need to be brought on board the vessel and ensure an accurate picture of identifying features was taken by the EM cameras. Such handling would likely increase dusky shark and other shark species mortality and thus not fully achieve the stated objectives of this rule. This alternative is also

unlikely to minimize the economic impact of this rule as compared to the preferred alternatives given the potential for reduced fishing revenues, monitoring equipment costs, and transaction costs.

Small Entity Compliance Guide

Section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996 states that, for each rule or group of related rules for which an agency is required to prepare a FRFA, the agency shall publish one or more guides to assist small entities in complying with the rule, and shall designate such publications as “small entity compliance guides.” The agency shall explain the actions a small entity is required to take to comply with a rule or group of rules. Copies of this final rule and the compliance guide are available upon request from NMFS (see **ADDRESSES**). Copies of the compliance guide will be available from the Highly Migratory Species Management Division website at <http://www.nmfs.noaa.gov/sfa/hms/>.

List of Subjects

15 CFR Part 902

Reporting and recordkeeping requirements

50 CFR Part 635

Fisheries, Fishing, Fishing vessels, Foreign relations, Imports, Penalties, Reporting and recordkeeping requirements, Treaties.

Dated: March 30, 2017

Alan D. Risenhoover,

Acting Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

For reasons set out in the preamble, NMFS amends 15 CFR part 902 and 50 CFR part 635 as follows:

Title 15—Commerce and Foreign Trade

PART 902—NOAA INFORMATION COLLECTION REQUIREMENTS UNDER THE PAPERWORK REDUCTION ACT: OMB CONTROL NUMBERS

1. The authority citation for part 902 continues to read as follows:

Authority: 44 U.S.C. 3501 *et seq.*

2. In § 902.1, in the table in paragraph (b) under “50 CFR”, add entries for “635.2”, “635.4(c)”, and “635.4(j)” in numerical order to read as follows:

§ 902.1 OMB control numbers assigned pursuant to the Paperwork Reduction Act.

* * * * *

(b) * * *

| CFR part or section where the information collection requirement is located | Current OMB control number (all numbers begin with 0648–) |
|---|---|
| ***** | |
| 50 CFR: | |
| ***** | |
| 635.2 | –0327 |
| ***** | |
| 635.4(c) | –0327 |
| ***** | |
| 635.4(j) | –0327 |
| ***** | |

Title 50—Wildlife and Fisheries

PART 635—ATLANTIC HIGHLY MIGRATORY SPECIES

3. The authority citation for part 635 continues to read as follows:

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

4. In § 635.2:

a. Remove the definition of “Protected species safe handling, release, and identification workshop certificate”; and

b. Add new definitions for “Safe handling, release, and identification workshop certificate” and “Shark endorsement” in alphabetical order to read as follows:

§ 635.2 Definitions.

* * * * *

Safe handling, release, and identification workshop certificate means the document issued by NMFS, or its designee, indicating that the person named on the certificate has successfully completed the Atlantic HMS safe handling, release, and identification workshop.

* * * * *

Shark endorsement means an authorization added to an HMS Angling, HMS Charter/Headboat, Atlantic Tunas General, or Swordfish General Commercial permit that allows for the retention of authorized Atlantic sharks consistent with all other applicable regulations in this part.

* * * * *

5. In § 635.4, revise paragraphs (b)(1), (c)(1), and (c)(2), and add paragraphs (c)(5) and (j)(4) to read as follows:

§ 635.4 Permits and fees.

* * * * *

(b) * * *

(1) The owner of a charter boat or headboat used to fish for, retain, possess, or land any Atlantic HMS must obtain an HMS Charter/Headboat permit. In order to fish for, retain, possess, or land Atlantic sharks, the owner must have a valid shark endorsement issued by NMFS. A vessel issued an HMS Charter/Headboat permit for a fishing year shall not be issued an HMS Angling permit, a Swordfish General Commercial permit, or an Atlantic Tunas permit in any category for that same fishing year, regardless of a change in the vessel's ownership.

* * * * *

(c) * * *

(1) The owner of any vessel used to fish recreationally for Atlantic HMS or on which Atlantic HMS are retained or possessed recreationally, must obtain an HMS Angling permit, except as provided in paragraph (c)(2) of this section. In order to fish for, retain, possess, or land Atlantic sharks, the owner must have a valid shark endorsement issued by NMFS. Atlantic HMS caught, retained, possessed, or landed by persons on board vessels with an HMS Angling permit may not be sold or transferred to any person for a commercial purpose. A vessel issued an HMS Angling permit for a fishing year shall not be issued an HMS Charter/Headboat permit, a Swordfish General Commercial permit, or an Atlantic Tunas permit in any category for that same fishing year, regardless of a change in the vessel's ownership.

(2) A vessel with a valid Atlantic Tunas General category permit issued under paragraph (d) of this section or with a valid Swordfish General Commercial permit issued under paragraph (f) of this section may fish in a recreational HMS fishing tournament if the vessel has registered for, paid an entry fee to, and is fishing under the rules of a tournament that has registered with NMFS' HMS Management Division as required under § 635.5(d). When a vessel issued a valid Atlantic Tunas General category permit or a valid Swordfish General Commercial permit is fishing in such a tournament, such vessel must comply with HMS Angling category regulations, except as provided in paragraphs (c)(3) through (c)(5) of this section.

* * * * *

(5) In order to fish for, retain, possess, or land sharks, the owner of a vessel fishing in a registered recreational HMS fishing tournament and issued either an Atlantic Tunas General category or Swordfish General Commercial permit must have a shark endorsement.

* * * * *

(j) * * *

(4) In order to obtain a shark endorsement to fish for, retain, possess, or land sharks, a vessel owner with a vessel fishing in a registered recreational HMS fishing tournament and issued or required to be issued either an Atlantic Tunas General category or Swordfish General Commercial permit or a vessel owner of a vessel issued or required to be issued an HMS Angling or HMS Charter/Headboat permit must take a shark endorsement online quiz. After completion of the quiz, NMFS will issue the vessel owner a new or revised permit with the shark endorsement for the vessel. The vessel owner can take the quiz at any time during the fishing year, but his or her vessel may not leave the dock on a trip during which sharks will be fished for, retained, possessed, or landed unless a new or revised permit with a shark endorsement has been issued by NMFS for the vessel. The addition of a shark endorsement to the permit does not constitute a permit category change and does not change the timing considerations for permit category changes specified in paragraph (j)(3) of this section. Vessel owners may request that NMFS remove the shark endorsement from the permit at any time. If NMFS removes the shark endorsement from the vessel permit, no person on board the vessel may fish for, retain, possess, or land sharks.

* * * * *

6. In § 635.8, revise paragraphs (a), (c)(2), (c)(3), (c)(5), (c)(6), and (c)(7) as follows:

§ 635.8 Workshops.

(a) *Safe handling, release, and identification workshops.* (1) Both the owner and operator of a vessel that fishes with longline or gillnet gear must be certified by NMFS, or its designee, as having completed a safe handling, release, and identification workshop before a shark or swordfish limited access vessel permit, pursuant to § 635.4(e) and (f), is renewed. For the

purposes of this section, it is a rebuttable presumption that a vessel fishes with longline or gillnet gear if: longline or gillnet gear is onboard the vessel; logbook reports indicate that longline or gillnet gear was used on at least one trip in the preceding year; or, in the case of a permit transfer to new owners that occurred less than a year ago, logbook reports indicate that longline or gillnet gear was used on at least one trip since the permit transfer.

(2) NMFS, or its designee, will issue a safe handling, release, and identification workshop certificate to any person who completes a safe handling, release, and identification workshop. If an owner owns multiple vessels, NMFS will issue a certificate for each vessel that the owner owns upon successful completion of one workshop. An owner who is also an operator will be issued multiple certificates, one as the owner of the vessel and one as the operator.

(3) The owner of a vessel that fishes with longline or gillnet gear, as specified in paragraph (a)(1) of this section, is required to possess on board the vessel a valid safe handling, release, and identification workshop certificate issued to that vessel owner. A copy of a valid safe handling, release, and identification workshop certificate issued to the vessel owner for a vessel that fishes with longline or gillnet gear must be included in the application package to renew or obtain a shark or swordfish limited access permit.

(4) An operator that fishes with longline or gillnet gear as specified in paragraph (a)(1) of this section must possess on board the vessel a valid safe handling, release, and identification workshop certificate issued to that operator, in addition to a certificate issued to the vessel owner.

* * * * *

(c) * * *

(2) If a vessel fishes with longline or gillnet gear as described in paragraph (a)(1) of this section, the vessel owner may not renew a shark or swordfish limited access permit, issued pursuant to § 635.4(e) or (f), without submitting a valid safe handling, release, and identification workshop certificate with the permit renewal application.

(3) A vessel that fishes with longline or gillnet gear as described in paragraph (a)(1) of this section and that has been, or should be, issued a valid limited access permit pursuant to § 635.4(e) or (f), may not fish unless a valid safe handling, release, and identification workshop certificate has been issued to both the owner and operator of that vessel.

* * * * *

(5) A vessel owner, operator, shark dealer, proxy for a shark dealer, or participant who is issued either a safe handling, release, and identification workshop certificate or an Atlantic shark identification workshop certificate may not transfer that certificate to another person.

(6) Vessel owners issued a valid safe handling, release, and identification workshop certificate may request, in the application for permit transfer per § 635.4(1)(2), additional safe handling, release, and identification workshop certificates for additional vessels that they own. Shark dealers may request from NMFS additional Atlantic shark identification workshop certificates for additional places of business authorized to receive sharks that they own as long as they, and not a proxy, were issued the certificate. All certificates must be renewed prior to the date of expiration on the certificate.

(7) To receive the safe handling, release, and identification workshop certificate or Atlantic shark identification workshop certificate, persons required to attend the workshop must first show a copy of their HMS permit, as well as proof of identification to NMFS or NMFS' designee at the workshop. If a permit holder is a corporation, partnership, association, or any

other entity, the individual attending on behalf of the permit holder must show proof that he or she is the permit holder's agent and provide a copy of the HMS permit to NMFS or NMFS' designee at the workshop. For proxies attending on behalf of a shark dealer, the proxy must have documentation from the shark dealer acknowledging that the proxy is attending the workshop on behalf of the Atlantic shark dealer and must show a copy of the Atlantic shark dealer permit to NMFS or NMFS' designee at the workshop.

7. In § 635.19, revise paragraph (d) to read as follows:

§ 635.19 Authorized gears.

* * * * *

(d) *Sharks.* (1) No person may possess a shark without a permit issued under § 635.4.

(2) No person issued a Federal Atlantic commercial shark permit under § 635.4 may possess a shark taken by any gear other than rod and reel, handline, bandit gear, longline, or gillnet, except that smoothhound sharks may be retained incidentally while fishing with trawl gear subject to the restrictions specified in § 635.24(a)(7).

(3) No person issued an HMS Commercial Caribbean Small Boat permit may possess a shark taken from the U.S. Caribbean, as defined at § 622.2 of this chapter, by any gear other than with rod and reel, handline or bandit gear.

(4) Persons on a vessel issued a permit with a shark endorsement under § 635.4 may possess a shark only if the shark was taken by rod and reel or handline, except that persons on a vessel issued both an HMS Charter/Headboat permit (with or without a shark endorsement) and a Federal Atlantic commercial shark permit may possess sharks taken by rod and reel, handline, bandit gear, longline, or gillnet if the vessel is engaged in a non for-hire fishing trip and the commercial shark fishery is open pursuant to § 635.28(b).

* * * * *

8. In § 635.21:
 - a. Add paragraph (c)(6);
 - b. Revise the introductory text for paragraph (d)(2);
 - c. Add paragraphs (d)(2)(iii) and (d)(4);
 - d. Revise paragraph (f); and
 - e. Add paragraphs (g)(5) and (k).

The additions and revisions read as follows:

§ 635.21 Gear operation and deployment restrictions.

* * * * *

(c) * * *

(6) The owner or operator of a vessel permitted or required to be permitted under this part and that has pelagic longline gear on board must undertake the following shark bycatch mitigation measures:

(i) *Handling and release requirements.* As safely as practicable, any hooked or entangled sharks that are not being retained must be released using dehookers or line clippers or cutters. If using a line clipper or cutter, the gangion must be cut so that less than three feet (91.4 cm) of line remains attached to the hook.

(ii) *Fleet communication and relocation protocol.* The owner or operator of any vessel that catches a dusky shark must, as quickly as practicable, broadcast the location of the dusky shark interaction over the radio to other fishing vessels in the surrounding area. Subsequent fishing sets by that vessel on that trip must be at least 1 nmi from the reported location of the dusky shark catch. Vessel owners and operators are encouraged to move the vessel further away

than 1 nmi if conditions (e.g., water temperature, depth, tide, etc.) indicate that moving a greater distance is warranted to avoid additional dusky shark interactions.

(d) * * *

(2) The operator of a vessel required to be permitted under this part and that has bottom longline gear on board must undertake the following bycatch mitigation measures:

* * * * *

(iii) *Fleet communication and relocation protocol.* The owner or operator of any vessel that catches a dusky shark must, as quickly as practicable, broadcast the location of the dusky shark interaction over the radio to other fishing vessels in the surrounding area. Subsequent fishing sets by that vessel on that trip must be at least 1 nmi from the reported location of the dusky shark catch. Vessel owners and operators are encouraged to move the vessel further away than 1 nmi if conditions (e.g., water temperature, depth, tide, etc.) indicate that moving a greater distance is warranted to avoid additional dusky shark interactions.

* * * * *

(4) Vessels that have bottom longline gear on board and that have been issued, or are required to have been issued, a directed shark limited access permit under § 635.4(e) must have only circle hooks as defined at § 635.2 on board.

* * * * *

(f) *Rod and reel.* (1) Persons who have been issued or are required to be issued a permit under this part and who are participating in a “tournament,” as defined in § 635.2, that bestows points, prizes, or awards for Atlantic billfish must deploy only non-offset circle hooks when using natural bait or natural bait/artificial lure combinations, and may not deploy a J-hook or an offset circle hook in combination with natural bait or a natural bait/artificial lure combination.

(2) A person on board a vessel that has been issued or is required to be issued a permit with a shark endorsement under this part and who is participating in an HMS registered tournament that bestows points, prizes, or awards for Atlantic sharks must deploy only non-offset, corrodible circle hooks when fishing for, retaining, possessing, or landing sharks south of 41° 43' N latitude, except when fishing with flies or artificial lures. Any shark caught south of 41° 43' N latitude on non-circle hooks must be released, unless the shark was caught when fishing with flies or artificial lures.

(3) A person on board a vessel that has been issued or is required to be issued an HMS Angling permit with a shark endorsement or an HMS Charter/Headboat permit with a shark endorsement must deploy only non-offset, corrodible circle hooks when fishing for, retaining, possessing, or landing sharks south of 41° 43' N latitude, except when fishing with flies or artificial lures. Any shark caught south of 41° 43' N latitude on non-circle hooks must be released, unless the shark was caught when fishing with flies or artificial lures.

(g) * * *

(5) *Fleet communication and relocation protocol.* The owner or operator of any vessel issued or required to be issued a Federal Atlantic commercial shark limited access permit that catches a dusky shark must, as quickly as practicable, broadcast the location of the dusky shark interaction over the radio to other fishing vessels in the surrounding area. Subsequent fishing sets by that vessel that trip must be at least 1 nmi from the reported location of the dusky shark catch. Vessel owners and operators are encouraged to move the vessel further away than 1 nmi if conditions (e.g., water temperature, depth, tide, etc.) indicate that moving a greater distance is warranted to avoid additional dusky shark interactions.

* * * * *

(k) *Handline*. (1) A person on board a vessel that has been issued or is required to be issued a permit with a shark endorsement under this part and who is participating in an HMS registered tournament that bestows points, prizes, or awards for Atlantic sharks must deploy only non-offset, corrodible circle hooks when fishing for, retaining, possessing, or landing sharks south of 41° 43' N latitude, except when fishing with flies or artificial lures. Any shark caught south of 41° 43' N latitude on non-circle hooks must be released, unless the shark was caught when fishing with flies or artificial lures.

(2) A person on board a vessel that has been issued or is required to be issued an HMS Angling permit with a shark endorsement or a person on board a vessel with an HMS Charter/Headboat permit with a shark endorsement must deploy only non-offset, corrodible circle hooks when fishing for, retaining, possessing, or landing sharks south of 41° 43' N latitude, except when fishing with flies or artificial lures. Any shark caught south of 41° 43' N latitude on non-circle hooks must be released, unless the shark was caught when fishing with flies or artificial lures.

9. In § 635.22, revise paragraph (c)(1) to read as follows:

§ 635.22 Recreational retention limits.

(c) * * *

(1) The recreational retention limit for sharks applies to any person who fishes in any manner, except to persons aboard a vessel that has been issued a Federal Atlantic commercial shark vessel permit under § 635.4. The retention limit can change depending on the species being caught and the size limit under which they are being caught as specified under § 635.20(e). If a commercial Atlantic shark quota is closed under § 635.28, the recreational retention limit for sharks and no sale provision in paragraph (a) of this section may be applied to persons aboard a

vessel issued a Federal Atlantic commercial shark vessel permit under § 635.4, only if that vessel has also been issued an HMS Charter/Headboat permit with a shark endorsement under § 635.4 and is engaged in a for-hire fishing trip. A person on board a vessel that has been issued or is required to be issued a permit with a shark endorsement under § 635.4 may be required to use non-offset, corrodible circle hooks as specified in § 635.21(f) and (k) in order to retain sharks per the retention limits specified in this section.

* * * * *

10. In § 635.71, revise paragraphs (a)(50) through (52), and add paragraphs (d)(21) through (d)(26) to read as follows:

§ 635.71 Prohibitions.

* * * * *

(a) * * *

(50) Fish without a NMFS safe handling, release, and identification workshop certificate, as required in § 635.8.

(51) Fish without having on board the vessel a valid safe handling, release, and identification workshop certificate issued to the vessel owner and operator as required in § 635.8.

(52) Falsify a NMFS safe handling, release, and identification workshop certificate or a NMFS Atlantic shark identification workshop certificate as specified at § 635.8.

* * * * *

(d) * * *

(21) Fish for, retain, possess, or land sharks without a shark endorsement, as specified in § 635.4(b) and (c).

(22) Except when fishing only with flies or artificial lures, fish for, retain, possess, or land sharks south of 41° 43' N latitude without deploying non-offset, corrodible circle hooks when fishing at a registered recreational HMS fishing tournament that has awards or prizes for sharks, as specified in § 635.21(f) and (k).

(23) Except when fishing only with flies or artificial lures, fish for, retain, possess, or land sharks south of 41° 43' N latitude without deploying non-offset, corrodible circle hooks when issued an Atlantic HMS Angling permit or HMS Charter/Headboat permit with a shark endorsement, as specified in § 635.21(f) and (k).

(24) Release sharks with more than 3 feet (91.4 cm) of trailing gear, as specified in § 635.21(c)(6).

(25) Fail to follow the fleet communication and relocation protocol for dusky sharks as specified at § 635.21(c)(6), (d)(2), and (g)(5).

(26) Deploy bottom longline gear without circle hooks, or have on board both bottom longline gear and non-circle hooks, as specified at § 635.21(d)(4).

* * * * *

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