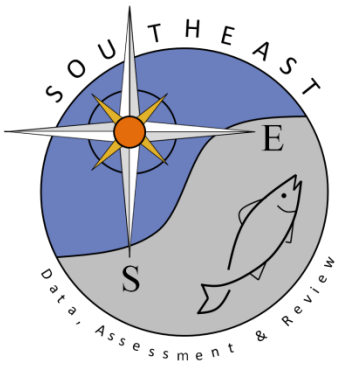
Final Amendment 14 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan

NOAA Fisheries: Highly Migratory Species

SEDAR77-RD55

Received: *4/18/2023*



This information is distributed solely for the purpose of pre-dissemination peer review. It does not represent and should not be construed to represent any agency determination or policy.

Final Amendment 14 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan

JANUARY 2023

NOAA FISHERIES

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service

Executive Summary

In Amendment 14, NOAA Fisheries sets forth a revised framework[1] to be used in establishing quotas and related management measures for Atlantic shark fisheries. No changes to existing regulations are being made at this time. This document incorporates for potential use several optional fishery management tools that were adopted in the 2016 revised guidelines for implementing National Standard 1 (NS1) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Amendment 14 modifies the general procedures that are followed in establishing the acceptable biological catch (ABC) and annual catch limits (ACLs), and the process used to account for carryover or underharvests of quotas. It also allows the option to phase-in ABC control rules and to adopt multi-year overfishing status determination criteria.

Atlantic highly migratory species (HMS) fisheries are managed under the authority of the Magnuson-Stevens Act and the Atlantic Tunas Convention Act (ATCA). Under the Magnuson-Stevens Act, NOAA Fisheries must, consistent with 10 National Standards, manage fisheries to maintain optimum yield on a continuing basis while preventing overfishing. ATCA authorizes the Secretary of Commerce (Secretary) to promulgate regulations as necessary and appropriate to carry out recommendations of the International Commission for the Conservation of Atlantic Tunas (ICCAT). The authority to issue regulations under the Magnuson-Stevens Act and ATCA has been delegated from the Secretary to NOAA Fisheries' Assistant Administrator for Fisheries. Currently, Atlantic sharks, tunas, swordfish, and billfish are managed under the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan (FMP) (2006 Consolidated HMS FMP) and its amendments.

A framework for establishing ACLs and accountability measures (AMs) for Atlantic HMS shark fisheries was implemented in Amendment 3 to the 2006 Consolidated HMS FMP. Consistent with the Magnuson-Stevens Act, the framework established a mechanism for specifying ACLs at a level that would prevent overfishing and for including AMs to ensure ACLs would not be exceeded. In 2016, NOAA Fisheries published a final rule (81 FR 71858; October 18, 2016) that, among other things, revised the NS1 guidelines. The revisions were aimed at improving and streamlining the guidelines to enhance their utility for managers and the public and providing flexibility in meeting MSA mandates. Final Amendment 14 revises the framework established in Amendment 3 to adopt some of the provisions in the revised NS1 guidelines. These provisions provide more flexibility in management measures to meet certain MSA mandates while accounting for uncertainty and improving stability within the fishery. Final Amendment 14 does not apply the revised framework to any of the shark stocks or stock complexes. Application of the revised framework would take place in subsequent FMP amendments or regulatory actions, with appropriate environmental impacts analysis and further opportunity for public comment.

[1] Recognizing that different FMPs may use different terminology, NMFS' Operational Guidelines generally define "frameworking" as establishing in an FMP/amendment or regulations a mechanism for implementing recurrent, routine, or foreseeable actions in an expedited manner. *See* NMFS Operational Guidelines, Appendix 1 at page 3 (terminology). Here, Amendment 14 uses "framework" in a broader sense (i.e., basic structure). The amendment does not set up a mechanism for recurrent, routine or foreseeable actions.

On May 21, 2019, NOAA Fisheries published a Notice of Intent to prepare an Environmental Impact Statement (EIS) for Amendment 14 to the 2006 Consolidated HMS FMP (84 FR 23014). From May 21 through July 31, 2019, NOAA Fisheries conducted four scoping meetings, and presented information about Amendment 14 scoping to the New England, Mid-Atlantic, and South Atlantic Fishery Management Councils and the Atlantic States Marine Fisheries Commission. The Agency received five written comments and a variety of verbal comments on options presented in the Amendment 14 Issues and Options paper. NOAA Fisheries was initially prepared to undertake an EIS for Amendment 14, but determined after considering public comments, the structure of the Amendment, and National Environmental Policy Act (NEPA) guidance, that an EIS would not be required for the Amendment as structured. Because the Amendment 14 framework would not implement measures with effects, it would not individually or cumulatively have a significant effect on the human environment and was therefore categorically excluded from further NEPA analysis, consistent with provisions in the Companion Manual for NOAA Administrative Order 216-6A.

Draft Amendment 14 was published on September 24, 2020, and public comment was taken through December 31, 2020 (85 FR 60132). A summary of public comments received and the Agency's responses are included in the Appendix. As part of that public comment period, NOAA Fisheries received requests to provide what type of an approach NOAA Fisheries would take to determine the ABC control rules for the Atlantic shark fishery. On January 24, 2022, NOAA Fisheries published a supplemental document providing further details on the application of the tiered ABC control rule (87 FR 3504). The publication of the supplemental document also included a public comment period through March 10, 2022. A summary of public comments received on the supplemental document and the Agency's responses are included in the Appendix.

After considering public comment, NOAA Fisheries is finalizing Amendment 14. A full description and analysis of the different management options considered can be found in Chapter 2 of this document. A list of final management options can be found below (Table 1). Because of the technical complexity in determining the appropriate level of scientific uncertainty for all stocks across all the different methodologies used in past shark stock assessments, NOAA Fisheries may phase in the ABC control rule changes for newly assessed stocks. A full description of any phased-in ABC control rule would be provided in future rulemakings, if appropriate.

Table 1. Preferred Management Options in Final Amendment 14 to the 2006 Consolidated HMS FMP.

Topic	Preferred Option*
Acceptable biological catch control rule	*Management Option A3* Create a tiered ABC control rule.
Phase-in acceptable biological catch control rule	*Management Option B2* Allow consideration of phase-in ABC control rules for modifications in ABC.
Annual catch limit development	*Management Option C2* Actively manage all sector ACLs (commercial and recreational).
	Management Option C5 Establish an ACL for each Atlantic shark management group, without commercial ACL quota linkages.
Carry-over	*Management Option D6* Allow carry-over for underharvest of the commercial quotas (landings only) under certain conditions.
Multi-year overfishing status determination criteria	*Management Option E3* Compare a three-year average of fishing mortality estimates to the OFL to determine overfishing status.

*No changes to the preferred options from the draft to final version.

Table of Contents

1 Introduction

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires that any fishery management plan (FMP) or FMP amendment be consistent with 10 national standards. Specifically, National Standard 1 (NS1) requires that "conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the United States fishing industry." In 2016, NOAA Fisheries revised the NS1 guidelines (81 FR 71858; October 18, 2016). The goal of the revisions was to improve, streamline, and enhance their utility for managers and the public, and to facilitate compliance with the requirements of the Magnuson-Stevens Act while providing additional management flexibility.

The 2016 revised NS1 guidelines addressed a range of issues, such as providing guidance on phasing in changes to catch limits and carrying over unused quota from one year to the next (81 FR 71858; October 18, 2016). In Final Amendment 14, NOAA Fisheries has decided to implement some of the management options from the 2016 NS1 guidelines for Atlantic shark stocks and management complexes. Final Amendment 14 focuses on provisions related to acceptable biological catch (ABC), annual catch limits (ACLs), carryover, and overfishing determinations. An ABC is "a level of a stock or stock complex's annual catch, which is based on an ABC control rule that accounts for the scientific uncertainty in the estimate of the overfishing limit (OFL), any other scientific uncertainty, and the Council's risk policy." 50 CFR 600.310(f)(1)(ii). An ACL is defined as "a limit on the total annual catch of a stock or stock complex, which cannot exceed the ABC, which serves as the basis for invoking AMs. An ACL may be divided into sector-ACLs." 50 CFR 600.310(f)(1)(iii).

Under the Magnuson-Stevens Act, the requirement to establish a mechanism for specifying ACLs and AMs applies "unless otherwise provided for under an international agreement in which the United States participates" (Pub. L. 109-479 104(b)(1)). This exception applies to stocks or stock complexes subject to management under an international agreement, which is defined as "any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party" (Magnuson-Stevens Act, section 3(24)). On January 16, 2009, NOAA Fisheries published NS1 guidelines providing guidance for implementing the ACL and AM requirements of the Magnuson-Stevens Act (74 FR 3178). Per the January 2009 final rule, ACLs and AMs apply to all fisheries "unless otherwise provided for under an international agreement in which the United States participates."

While small coastal sharks, large coastal sharks, and pelagic sharks are predominantly managed through domestic management measures, ICCAT has adopted a number of recommendations regarding sharks caught in association with ICCAT fisheries (e.g., ICCAT recommendations 04-10, 10-07, 10-08, 11-08, 15-06, 17-08, 19-06, 19-07, 21-09). ATCA authorizes the Secretary of Commerce to promulgate regulations as may be necessary and appropriate to implement binding ICCAT recommendations. Some shark species or complexes (e.g., small coastal sharks) are managed solely through domestic actions taken under the Magnuson-Stevens Act. Other shark species (e.g., shortfin mako sharks) are managed through a combination of domestic actions taken under the Magnuson-Stevens Act and international actions taken pursuant to international

fishery agreements or through other appropriate international organizations. As Regional Fishery Management Organizations, including ICCAT, undertake more direct management measures for shark fisheries, the methods for managing affected species may also adapt in response.

Atlantic shark stock assessments for large coastal, small coastal, and smoothhound sharks are generally completed through the Southeast Data, Assessment, and Review (SEDAR) process. SEDAR assessments have previously been classified as benchmark-type, standard-type, or update-type assessments. More recently, SEDAR assessments have been classified as either research track or operational assessments. These new classifications apply to future assessments undertaken under this new scheme; older assessments will remain as previously classified. Research track assessments are similar to benchmark assessments, in that they are peer reviewed and have numerous opportunities for public input; and are used to develop the tools, data, and models used in the stock assessment process. Research track assessments are not used to provide management advice. Instead, they establish the foundations for operational assessments that do provide management advice. Operational assessments, which may include procedures similar to the previous standard-type and update-type assessments, use previously approved methods and data sources to provide management advice quickly and efficiently. The major differences between research track and operational assessments are summarized in Table 2 of the best scientific information available (BSIA) framework for Atlantic Highly Migratory Species (HMS) stock assessments and stock status determinations (https://www.fisheries.noaa.gov/resource/document/atlantic-highly-migratory-species-best-scientific-information-available-regional). The first HMS stocks that are being assessed using this approach are the hammerhead shark species, in 2021-2023.

Some shark stock assessments are conducted outside the SEDAR process. ICCAT, through its Standing Committee on Research and Statistics (SCRS) conducts some shark stock assessments, primarily pelagic shark assessments (blue, porbeagle, and shortfin mako sharks). Information on these assessments is available at https://www.iccat.int/en/assess.html. In addition, NOAA Fisheries has accepted peer reviewed stock assessments conducted by academia in the past and in limited instances has used them for management purposes (scalloped hammerhead shark, Hayes et al. 2009), and is exploring the use of peer reviewed stock assessments conducted externally to the agency for management purposes. Recent stock assessments have aimed to assess species individually at the stock level to the extent possible, with the assessment providing a total allowable catch (TAC) for that species.

Atlantic shark stock assessments produce a sustainable catch level (referred to as a TAC), which incorporates scientific uncertainty in the stock assessment. NOAA Fisheries then uses that information to calculate the ACL. Since Amendment 3 to the 2006 Consolidated HMS FMP, NOAA Fisheries has, in practice, set the ABC, OFL, and overall ACL equal to the TAC (TAC=OFL=ABC=ACL). For more explanation on this process, see the description of Amendment 3 below under the Management History section. NOAA Fisheries has used the subsequent ABC to calculate the shark sector ACLs (commercial ACL, recreational ACL, and discard ACL). The commercial sector ACL is further divided into the commercial landings quota and commercial dead discards for the non-prohibited shark species, while the recreational ACL includes both landings and discards. The discard sector ACL includes discard estimates within HMS managed fisheries and from fisheries that are not managed as part of the HMS fishery

management plan to ensure that all mortality is included. The discard estimates are currently calculated during a stock assessment.

For the prohibited shark complex, where the fisheries are closed and commercial and recreational retention and landings are not allowed, the ACL is set equal to zero, which NOAA Fisheries clarified in Amendment 5b (82 FR 16478; April 4, 2017). Final Amendment 14 is not changing the approach to management of the prohibited shark complex.

In light of the 2016 revised NS1 guidelines, NOAA Fisheries is revising the framework established in Amendment 3 to include modifying the ABC control rule, revising processes for the implementation of an ABC, and modifying the management options for carry-over, phase-in, and multi-year overfishing provisions. In Final Amendment 14, NOAA Fisheries determined the preferred management options for federally-managed Atlantic shark stocks within the following topic areas:

- ABC Control Rule Management Options;
- Phase-In ABC Control Rule;
- ACL Development;
- Carry-over options; and
- Multi-Year Overfishing Status Determination Criteria.

These preferred options would establish the general framework through which specific management measures would later be developed and adopted. Any changes to the management and quotas of HMS-managed Atlantic sharks would occur in future FMP amendments or regulatory action. A full description of the management options considered can be found in Chapter 2.

NOAA Fisheries published a Notice of Intent to prepare an Environmental Impact Statement (EIS) for Amendment 14 (84 FR 23014; May 21, 2019). Comments received on the Amendment 14 scoping document also included comments provided at the May 2019 HMS Advisory Panel meeting. Details on the comments received during the scoping comment period are listed in Appendix 1.

NOAA Fisheries was initially prepared to undertake an EIS for Amendment 14, but determined after considering public comments, the structure of the Draft Amendment, and NEPA guidance, that an EIS is not required. Amendment 14 would only establish the procedures to set the ABC, ACLs, and quotas, and calculate carryover or underharvests of sharks. Amendment 14 would not make changes to the current quotas or other management measures. Any changes to ABCs, ACLs, quotas, or carryover would be made in future FMP amendments or regulatory action, and would be informed by the appropriate NEPA analyses and public review. Since the Amendment 14 framework itself would not implement measures with effects, it would not individually or cumulatively have a significant effect on the human environment and is appropriately categorically excluded from further NEPA analysis. As neither an environmental assessment nor an EIS is required, NOAA Fisheries has determined that Amendment 14 is categorically excluded from further NEPA analysis.

NOAA Fisheries published Draft Amendment 14 on September 24, 2020, and public comment was taken through December 31, 2020 (85 FR 60132). Through the public comment period,

NOAA Fisheries received 10 written comments along with numerous oral comments at various meetings. As part of that public comment period, NOAA Fisheries also received requests to provide what type of an approach would be taken in determining our ABC control rules. On January 24, 2022, NOAA Fisheries published a supplemental document providing further details on the application of the tiered ABC control rule (87 FR 3504) and reopened the comment period through March 10, 2022. During that comment period, NOAA Fisheries received eight written comments along with numerous oral comments. For a summary of the comments received along with the Agency's response, please refer to Appendix 1.

For FMPs and plan amendments, the Magnuson-Stevens Act requires a fishery impact statement (FIS), which assesses, specifies, and describes the likely effects of conservation and management measures on participants in the fishery or fisheries being managed, fishing communities, and participants in neighboring fisheries. The FIS includes an assessment and description of the economic and social impacts of the final action on the various components of the fishery being managed, over the entire range of the regulated species, on participants in the fishery and in other fisheries, and on fishing communities. Chapter 4 is the FIS for Final Amendment 14.

Management History

In 1993, NOAA Fisheries finalized the first FMP for Sharks of the Atlantic Ocean (58 FR 21931; April 26, 1993) (1993 FMP). The 1993 FMP established many of the management measures for Atlantic sharks that are the basis for those in place today, including permitting and reporting requirements, management complexes, commercial quotas, and recreational bag limits. NOAA Fisheries has continued to implement various management measures for Atlantic shark fisheries, including revised quotas, management group (i.e., a group of shark species that are combined for quota management purposes, and a mechanism for establishing ACLs. Those management measures that are relevant to the options under consideration in this action are discussed below. For more detailed information, please see the 1999 FMP for Atlantic Tunas, Swordfish, and Sharks (64 FR 29090; May 28, 1999) (1999 FMP), Amendment 1 to the 1999 FMP, the 2006 Consolidated HMS FMP, and Amendments 2, 3, 5a, 5b, 6, 9, and 11 to the 2006 Consolidated HMS FMP.

1999 FMP for Atlantic Tunas, Swordfish, and Sharks

In the 1999 FMP for Atlantic Tunas, Swordfish, and Sharks and Amendment 1 to the Atlantic Billfish FMP, many of the management practices from the 1993 FMP were changed. For example, the 1999 FMP established that management measures for overfished Atlantic tunas, swordfish, and sharks should have at least a 50 percent chance of rebuilding within a specified rebuilding timeframe. Compared to other HMS and fish species, many shark species are slow growing, take a long time to mature, have few pups, and have a low reproductive potential, reproducing only every two or three years. As described in the 1999 FMP, when addressing management measures for overfished Atlantic shark stocks, NOAA Fisheries' general objective is to rebuild the stock within the rebuilding period with a 70-percent probability. For some shark stocks, depending on factors such as the level of data uncertainty, NOAA Fisheries has occasionally, and on a case-by-case basis, determined that a different level of probability is appropriate. For stocks where overfishing is occurring, the FMP specified that NOAA Fisheries

would adopt measures to end overfishing immediately, consistent with the Magnuson-Stevens Act and NS1 requirements.

Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks

In 2003, in Amendment 1 to the 1999 FMP (68 FR 74746; December 24, 2003), NOAA Fisheries established, among other things, that shark quota levels would start with the maximum sustainable yield (MSY) calculated in the stock assessment. That level was then reduced, as appropriate; to achieve that OY on a continuing basis. For stocks that were not overfished, OY was equal to MSY reduced by 25 percent. For overfished stocks, MSY was reduced by the amount recommended in the stock assessment, tempered by other management measures that could decrease shark mortality. OY was divided into three parts: commercial landings, recreational harvest, and dead discards, with dead discards and recreational landings accounted for before calculating the overall commercial quota. This approach to calculating the commercial quota is very similar to the current methodology. The resulting overall commercial quota was then split, based on past landings, into three fishing seasons for the entire year. Each year, the seasonal commercial quota was adjusted as appropriate based on any over- and/or underharvest from the relevant fishing season in the previous year.

Amendment 2 to the 2006 Consolidated HMS FMP

Amendment 2 to the 2006 Consolidated HMS FMP (73 FR 35778; June 24, 2008; corrected version published July 15, 2008; 73 FR 40658), implemented revised management measures, including a single shark fishing season each year, and a measure to close specific shark fisheries with a minimum of five days' notice once 80 percent of the quota was harvested (See Amendment 3 explanation, below, discussing changes to this measure). This closure approach provided a management buffer for landings that may have occurred outside of federal waters but are counted against the federal quota (e.g., state landings) or were reported and/or accounted for after the season closed.

Amendment 3 to the 2006 Consolidated HMS FMP

Congress amended the Magnuson-Stevens Act in 2007 to require that each FMP establish a mechanism for specifying ACLs at a level that will prevent overfishing and include AMs to ensure ACLs are not exceeded (16 U.S.C. §1853(a)(15)). Amendment 3 amended the HMS FMP to include a mechanism to specify ACLs for stock complexes and certain specific shark species (75 FR 30483; June 1, 2010; corrected version published August 17, 2010; 75 FR 50715). It also identified AMs. Amendment 3 was implemented consistent with the 2009 NS1 guidelines related to ACLs, AMs, and reference points (74 FR 3177; January 16, 2009).

Amendment 3 Mechanism for Establishing ACLs and AMs

According to the NS1 guidelines, ACLs and AMs are related to other reference points, including an OFL and ABC. OFL is greater than or equal to the ABC limit, which is greater than or equal to the ACL. As such, Amendment 3 established for all Atlantic sharks a mechanism to use when

establishing ACLs and applying AMs. The following excerpt from Amendment 3 explains the approach taken:

> "NMFS considers the OFL to be the annual amount of catch that corresponds to the estimate of maximum fishing mortality threshold (MFMT) applied to the stock abundance. The ABC would be established to account for uncertainty in the assessment. Ideally, the actual ABC would be established as part of the stock assessment reports, results, and/or conclusions. However, because the current assessments predate [National Standard 1 Guidelines] NSG1 and because some stock assessments, particularly those done by ICCAT scientists, may not provide an ABC, until such a time that new stock assessments for HMS incorporate an estimate of ABC, NMFS is establishing the ABC equal to the ACL for sharks. This would ensure that the ABC is below the OFL, which is required under NSG1, and should account for scientific uncertainty at a level that is acceptable given the biological characteristics of the species. Management uncertainty can be accounted for using some AMs (e.g., precautionary inseason management) or the use of ACTs less than a stock's ACL.
>
> In general, the ACL is equivalent to the total allowable catch (TAC) for all fisheries that interact with a given shark species. The TAC, or ACL, is provided as part of the stock assessment report, results, and/or conclusions and is the level of mortality that is acceptable given the biological characteristics of the species that would allow a stock to rebuild or remain sustainable during a given timeframe. For overfished stocks, the ACL is equal to the stock assessment's projection that shows rebuilding with a 70-percent chance of success. NMFS uses the 70-percent probability of rebuilding for sharks given their life history traits, such as late age of maturity and low fecundity (i.e., instead of 50-percent, which is commonly used for other species). Additionally, NMFS may establish "sector-ACLs," such as recreational harvest, discards from other fisheries, and the commercial harvest. The commercial harvest would include discards and the "commercial landings components of the sector ACL," which would be the commercial landings quota for specific shark fisheries.
>
> A number of shark stocks have not been individually assessed. Additionally, a number of shark stocks are managed in a complex as some species have not been individually assessed, such as oceanic whitetip (*Carcharhinus longimanus*) and common thresher sharks (*Alopias vulpinus*). As such, NMFS is establishing some exceptions to the above mechanism for establishing ACLs and AMs. For example, MSY, OY, and the status determination criteria for pelagic sharks have been defined in the 1999 FMP (see below) and do not change in this amendment. Additionally, quotas have been established for the pelagic shark complex and for blue and porbeagle sharks. * * *. [G]iven that the current commercial quotas and recreational bag limits serve as limits on catch and prevent overfishing, in the absence of a specific TAC, NMFS considers these quotas to be equivalent to the ACL, ABC, and TAC for pelagic sharks. As needed and required, NMFS can adjust these ACLs and apply AMs.
>
> For sharks, the quotas are generally for the commercial fishery, not the recreational fishery. NMFS has not established quotas for the recreational shark fishery due to the

difficulty in estimating recreational catches in real time, but may consider doing so in the future. While the shark recreational fishery does not have a formal quota, catches within the recreational shark fishery are considered when stock assessments are conducted and are taken into account when NMFS establishes the OFL, ABC, ACL, and TAC. NMFS also takes the recreational catches, along with discards from the commercial sector, into account when establishing the commercial quota or "commercial landings components of the ACL." Because sector ACLs are being used, sector AMs would also be used. This action would change the quotas for small coastal sharks (SCS) and establish a commercial quota for smooth dogfish. It does not change the quotas that were previously established for large coastal sharks (LCS) and pelagic sharks.

NSG1 also requires NMFS to establish AMs. NMFS already has AMs along with measures analogous to annual catch targets (ACTs) in place in commercial Atlantic shark fisheries. Specifically, NMFS closes the quota for each shark species/complex with five days' notice upon filing in the Federal Register when 80 percent of a given quota is filled or projected to be reached. Eighty percent of the shark quota is, therefore, the ACT. An example of a postseason AM currently in the HMS FMP for these fisheries is overharvests of the commercial quotas are removed from the next fishing year's quota. In addition, underharvests for shark species that are not overfished or are not experiencing overfishing are added to the base quota the following year and carry forward is capped at 50 percent of the base quota. There is no carryover of underharvests for species that are unknown, overfished, or experiencing overfishing. The measures considered in this final Amendment 3 to the Consolidated HMS FMP do not change these AMs.

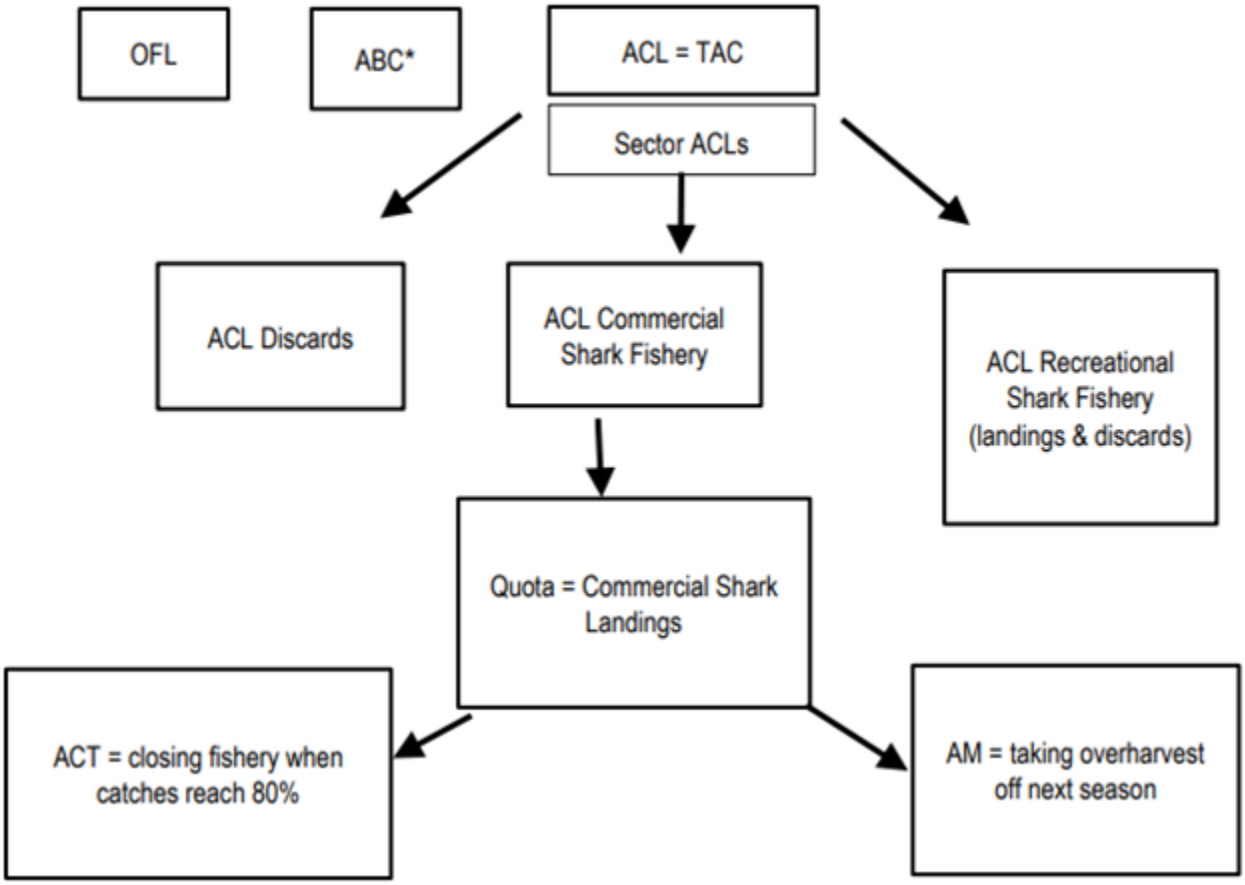
In summary, this amendment and associated rulemaking establishes the mechanism for specifying ACLs as required by Section 303(a)(15) of the statute and is consistent, to the greatest extent practicable with NSG1. Quotas, or landings component of the sector ACL, would be adjusted annually for over- and underharvests from the previous fishing year. ACLs are adjusted based on the result of stock assessments, which are usually done through a FMP amendment. In short, for all HMS managed sharks, with the exceptions noted above, the methods are:

- OFL>ABC≥ ACL (until estimates of ABC are available);
- OFL = the annual amount of catch that corresponds to the estimate of MFMT applied to a stock's abundance relative to the level of fishing mortality (F);
- ABC = to be determined by future stock assessments, as appropriate; in the interim, NMFS assumes ABC=ACL;
- ACL = TAC; for overfished stocks this will be the projection that shows 70 percent probability of rebuilding;
- Commercial quota = landings component of the sector ACL; and
- AMs = restrictions on use of over- and underharvests and closing the fishery when commercial landings are at or projected to be at 80 percent of the quota."

Under the mechanisms established in Amendment 3, if NOAA Fisheries receives a sustainable catch level that incorporates scientific uncertainty in stock assessments, such as a TAC from an Atlantic shark stock assessment, NOAA Fisheries uses that information to calculate the ACL. If

an ABC or an OFL has not been determined in a recent Atlantic shark stock assessment, the ABC and OFL are set equal to the ACL, which is then set equal to the TAC recommended in the stock assessment. NOAA Fisheries selects a TAC from the assessment with a 70-percent chance of maintaining healthy stock status or probability of rebuilding overfished stocks. This is the risk policy for HMS when determining the TAC for a shark species after an assessment. The ACL is then split into "sector-ACLs" based on proportions of harvest that is caught or discarded, similar to the process described in Amendment 1 to the 1999 FMP (Figure 1). The commercial sector ACL is set the same as the commercial quota plus commercial discards.

Figure 1. Generalized Mechanism for Establishing ABCs/ACLs under Amendment 3.



Note: Currently, ACL = ABC as no ABC has been designated in shark stock assessments.

Amendment 5a to the 2006 Consolidated HMS FMP

The final rule for Amendment 5a to the 2006 Consolidated HMS FMP (Amendment 5a) was published on July 3, 2013 (78 FR 4038) and implemented measures to maintain rebuilding of sandbar sharks; end overfishing and rebuild scalloped hammerhead and Atlantic blacknose sharks; and establish a TAC and commercial quota and recreational measures for Gulf of Mexico blacknose and blacktip sharks (NOAA Fisheries 2013). The management groups, commercial quotas, and quota linkages are outlined in Figure 2 below. *See* 50 C.F.R. 635.28(b) for relevant regulatory text.

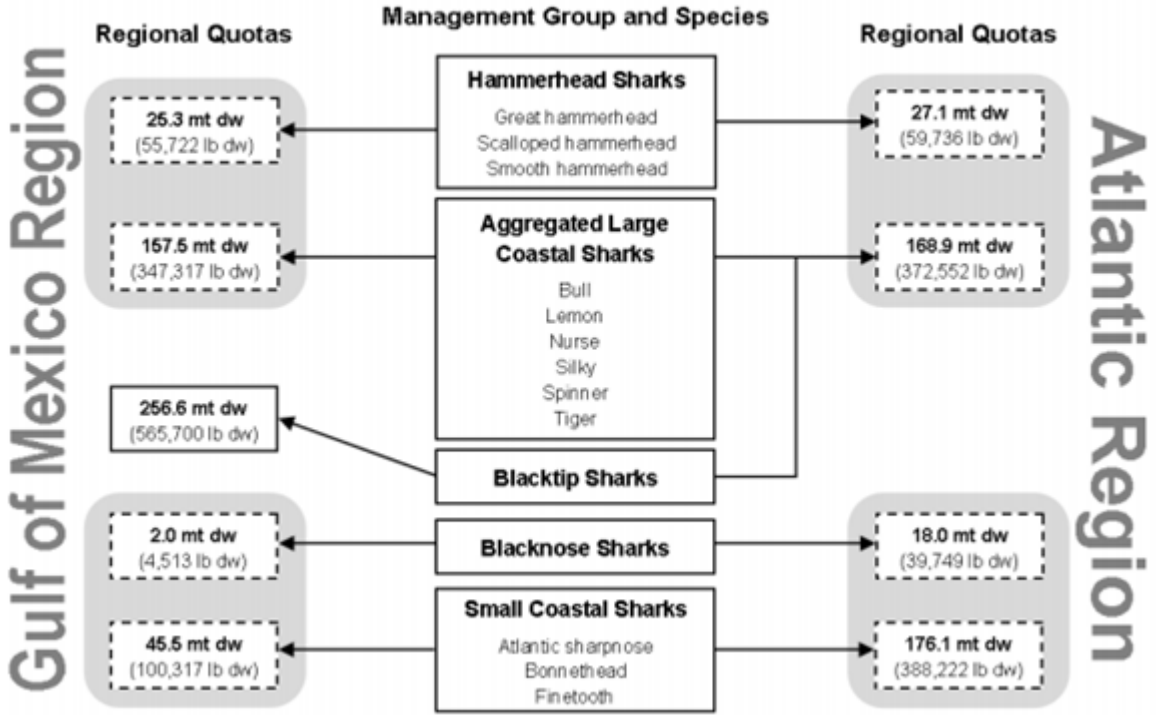


Figure 2. Diagram of Management Group, Commercial Quotas, and Quota Linkages Resulting from the Implementation of Amendment 5a to the 2006 Consolidated HMS FMP.

Notes: mt = metric tons; dw = dressed weight. This figure represents the management measures under Amendment 5a to the 2006 Consolidated HMS FMP, which have been since revised in subsequent rulemakings.

Amendment 5b to the 2006 Consolidated HMS FMP

Amendment 5b to the 2006 Consolidated HMS FMP clarified, among other things, ACLs for the prohibited shark species complex and implemented preventative AMs for the complex (82 FR 16478; April 4, 2017). Amendment 5b clarified that the ACL for the prohibited shark complex is zero, consistent with provisions in the NS1 guidelines. Under the NS1 guidelines, if an ACL is set equal to zero and the AMs for the fishery is a closure that prohibits fishing for a stock, as is the case with the prohibited shark complex, additional AMs are not required if only small amounts of catch (including bycatch) occur, and the catch is unlikely to result in overfishing; see § 600.310(g)(3). Dusky sharks are within the prohibited shark complex and were experiencing overfishing. Amendment 5b adopted additional AMs for that stock, reducing fishing mortality to the extent needed to end overfishing and rebuild the stock. While stock assessments have not been completed for any other prohibited shark species, the best available information does not suggest that overfishing is occurring on other species in this complex. Commercial and recreational retention and landings of prohibited sharks are not allowed, the fishery is closed, and there is only a small amount of bycatch occurring for the complex. NOAA Fisheries established a mechanism in Amendment 5b to annually monitor a rolling three-year average of the bycatch to ensure it remains small or whether additional measures should be considered.

Amendment 6 to the 2006 Consolidated HMS FMP

Amendment 6 to the 2006 Consolidated HMS FMP (80 FR 50074; August 18, 2015) established, among other things, a non-blacknose SCS TAC of 489.3 metric tons (mt) dressed weight (dw) and a non-blacknose SCS TAC of 999.0 mt dw in the Atlantic and Gulf of Mexico regions, respectively. Additionally, this final rule apportioned the Gulf of Mexico regional commercial quotas for aggregated LCS, blacktip, and hammerhead sharks into western and eastern sub-regional quotas.

Amendment 9 to the 2006 Consolidated HMS FMP

Amendment 9 to the 2006 Consolidated HMS FMP (80 FR 73128; November 24, 2015) implemented the smooth dogfish/smoothhound shark measures that were delayed in Amendment 3. Smoothhound sharks include smooth dogfish, Florida smoothhound, and Gulf of Mexico smoothhound. While all three species are regularly seen in the Gulf of Mexico, only smooth dogfish are seen along the Atlantic coast. The regulations implemented in Amendment 9 included establishment of an open access commercial smoothhound shark vessel permit. As authorized by the Shark Conservation Act, which otherwise broadly prohibits the removal of shark fins at sea, this permit allows for the removal of smoothhound shark fins at sea along the Atlantic Coast from Maine through the east coast of Florida as long as they make up at least 25 percent of retained catch on board by weight, and the fin-to-carcass ratio does not exceed 12 percent. Amendment 9 also established regional smoothhound quotas in the Atlantic and Gulf of Mexico and required shark recreational anglers to obtain an HMS Angling or Charter/Headboat permit to retain smoothhound sharks caught in federal waters. Dealers purchasing smoothhound sharks caught in federal waters are also required to obtain an HMS dealer permit.

Status of Atlantic Shark Stocks

Stock assessments measure the impact of fishing on stocks and project harvest levels that maximize the number of fish that can be caught while preventing overfishing, and where necessary, rebuild depleted stocks. The thresholds that NOAA Fisheries uses to determine the status of Atlantic HMS are presented in Figure 3. This figure, also called a Kobe or phase plot, is often used by stock assessment scientists to summarize the results of various stock assessment models or configurations. A stock is considered "overfished" when the current biomass (B) is less than the minimum stock size threshold ($B < MSST$). The minimum stock size threshold (MSST) is determined based on the natural mortality of the stock and the biomass at maximum sustainable yield (B_{MSY}). Maximum sustainable yield (MSY) is the maximum long-term average yield that can be produced by a stock on a continuing basis. The biomass can fall below the B_{MSY} without causing the stock to be declared "overfished" as long as the biomass is above MSST.

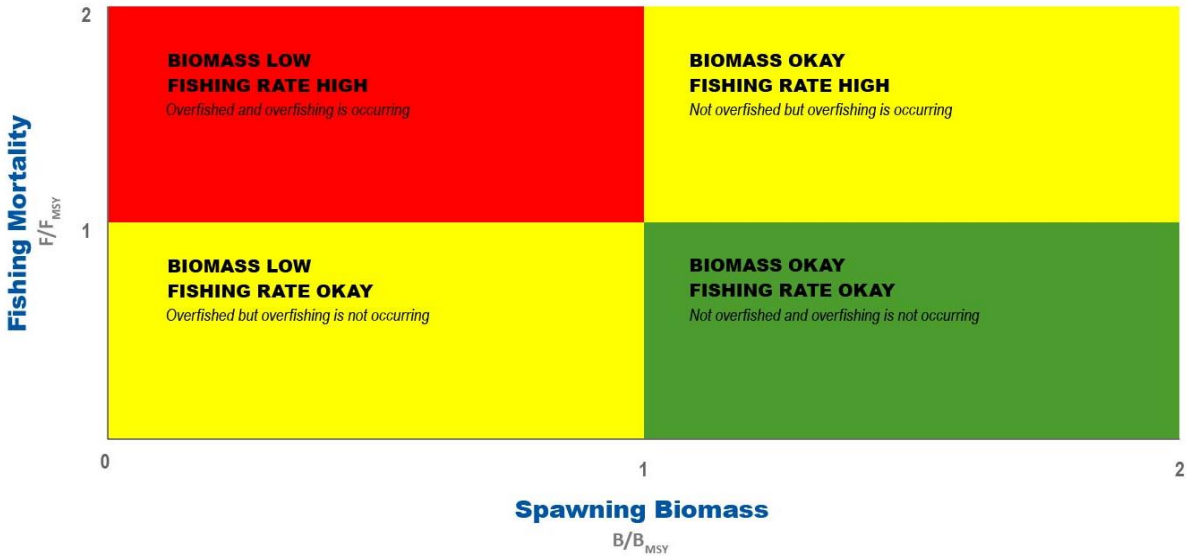


Figure 3. "Kobe Plot" Representation of Stock Status Determination and Rebuilding Terms

Management Objectives

The objectives of Amendment 14 are to incorporate additional flexibility into an updated framework for Atlantic fisheries, with modifications to the ABC control rule and ACL provisions, and with options regarding status determination criteria, carryover, and phase-in of changes in acceptable catch levels, consistent with NS1 and the NS1 Guidelines. NOAA Fisheries explored options for modifying or establishing reference points and increasing management flexibility for Atlantic shark fisheries under its management. Such flexibility is needed to account for uncertainty and improving stability within the fishery. After review and public comment, NOAA Fisheries has determined the preferred options for modifying or establishing reference points and increasing management flexibility for Atlantic shark fisheries under its management.

NOAA Fisheries identified the following objectives for this action:

- Optimize the ability for the commercial shark fishery to harvest available, science-based shark quotas, to the extent practicable, while also considering fairness among sectors.
- Revise the ABC control rule methodology established in Amendment 3 to increase accountability and transparency when implementing ABCs for shark fisheries, consistent with provisions in the NS1 guidelines.
- Revise the ACL framework to reflect changes in the ABC control rule methodology to ensure that effective ACLs are established for non-prohibited shark species, taking into account scientific uncertainty.
- Modify the process for accounting for quota underharvest or overharvest in the commercial sector ACLs.
- Increase management flexibility to react to and account for changes in the distribution of shark harvest among sectors.
- Increase management flexibility to appropriately react to scientific uncertainties, changes in stock status, or changes in allowable harvest levels to ensure stability within the fishery.

Scope and Organization of this Document

Amendment 14 does not make any regulatory changes to how Atlantic HMS fisheries are carried out, but instead implements an updated framework for future action, including factors that would be considered with future implementation of conservation and management measures. Any operational changes to fishery management measures as a result of Amendment 14 would be considered in subsequent rulemakings, as appropriate. As discussed above, NOAA Fisheries has determined that this amendment is categorically excluded from further NEPA review because it would have no significant direct, indirect or cumulative ecological and socioeconomic impacts. This amendment does not involve extraordinary circumstances precluding the use of a CE, and is not connected to a larger action and can be reviewed independently from other actions under NEPA. Thus, NOAA Fisheries did not prepare an EIS or an EA for Amendment 14 and did not

analyze alternatives to the actions in Amendment 14. NOAA Fisheries has considered public comment before finalizing Amendment 14 and a summary of these comments and the Agency's responses are included in the Appendix.

This Amendment is set out as follows: Chapter 2 provides a description of the different management options being considered. Chapter 3 describes the affected environment. Chapter 4 is the fishery impact statement. Chapter 5 explains applicable law in relation to the Amendment's final management options, and Chapter 6 lists preparers, persons consulted, and a summary of the comments received during scoping.

2 Summary of Management Options

Amendment 14 provides final management options that would meet the objectives of the action as described in Chapter 1. These management options consider changes to an ABC control rule for sharks, explore different ways to implement phase-in and carry-over provisions, and consider different ways to implement multi-year overfishing determinations.

Topic A: Acceptable Biological Catch Control Rule

The Magnuson-Stevens Act requires ACLs that prevent overfishing for all federally-managed fish stocks. The OFL-ABC-ACL definition framework was established in NS1 guidelines in order to set ACLs that prevent overfishing while accounting for both scientific and management uncertainty. The OFL is the best estimate of the maximum amount of a stock that can be caught in a year without resulting in overfishing. The ABC is the catch level, usually recommended by a Council's Scientific and Statistical Committee (SSC) that accounts for scientific uncertainty in the estimate of OFL, as well as any other sources of scientific uncertainty, and a risk policy. The ABC may not exceed the OFL, and the degree to which the ABC is reduced from the OFL is based on the level of scientific uncertainty and risk preferences described in the ABC control rule. Finally, the ACL is the limit on the total annual catch for a stock or stock complex. The ACL is informed by the OFL and ABC and cannot exceed the ABC. The ACL can be set lower than the ABC to account for the degree to which the stock's management measures are able to accurately constrain catch (i.e., management uncertainty) as well as relevant ecological, economic, and social considerations.

The NS1 guidelines state, "[f[or stocks and stock complexes required to have an ABC, each Council [or Secretary for HMS] must establish an ABC control rule that accounts for scientific uncertainty in the OFL and for the Council's risk policy, and that is based on a comprehensive analysis that shows how the control rule prevents overfishing. The Council's risk policy could be based on an acceptable probability (at least 50 percent) that catch equal to the stock's ABC will not result in overfishing, but other appropriate methods can be used." 50 CFR 600.310(f)(2). Additionally, the NS1 guidelines state, "[w]hen determining the risk policy, Councils could consider the economic, social, and ecological trade-offs between being more or less risk averse. The Council's choice of a risk policy cannot result in an ABC that exceeds the OFL. The process of establishing an ABC control rule may involve science advisors or the peer review process established under Magnuson-Stevens Act section 302(g)(1)(E)."

NOAA Fisheries outlines different management options and the preferred option for the general approach to the ABC control rule framework for the Atlantic shark fisheries below. This Amendment establishes the framework but does not apply it to particular stocks. Instead, NOAA Fisheries would, in future rulemakings, propose application and detailed analysis on the application of the ABC control rule for shark stocks and how any quotas may change as a result.

Management Option A1

No Action. Maintain the existing ABC methodology established in Amendment 3 where the TAC, OFL, and ABC are all set equal and they all equal the sum of the sector ACLs (TAC = OFL = ABC = ACL).

Under Management Option A1, NOAA Fisheries would maintain the current approach for setting an ABC for sharks. NOAA Fisheries developed the current ABC methodology for sharks through Amendment 3 to the 2006 Consolidated HMS FMP. Under the applicable NS1 guidelines at the time (2009 guidelines), OFL = ABC = ACL was allowed if there was justification and analysis for why the approach would prevent overfishing. The justification for this approach was articulated above under the Amendment 3 management history and stated that a biological reference point, such as the TAC, from an Atlantic shark stock assessment is used to calculate the ACL. The TAC from the assessment has a 70-percent chance of maintaining healthy stock status or rebuilding such that the TAC would have a high probability of not negatively impacting healthy stock status.

For all shark stocks that are assessed, NOAA Fisheries currently sets the ABC equivalent to the TAC based on the information provided by current shark stock assessments. For overfished stocks, in most cases, the TAC and the resulting ABC is equal to the stock assessment's projection that would end overfishing and would rebuild with a 70-percent chance of likelihood within the rebuilding time period. For stocks that are not overfished, the TAC and resulting ABC is equal to the stock assessment's projection that shows the stock would not undergo overfishing within a certain time period specified within the assessment. NOAA Fisheries usually uses this 70-percent (instead of 50-percent, which is commonly used for other species) probability standard for sharks as a function of the risk policy because of life history traits, such as late age of maturity and low fecundity, and the variability in the modeling. In the past, however, NOAA Fisheries has also used 50-percent or other probabilities on a case-by-case basis, based on scientific advice. Therefore, under this option (the status quo), the ABC, which is set equal to the TAC, accounts for scientific uncertainty in the TAC based on the stock assessment and a risk tolerance that reflects the life history traits of sharks.

For stocks that are not assessed, NOAA Fisheries sets the ABC based on historic harvest information in combination with any information from past quota levels (e.g., the ABC for the aggregated large coastal shark management group or the ABC of the non-blacknose small coastal shark management group) or sets the ABC based on the ABC of the species that is assessed within that management group (e.g., the ABC for the hammerhead shark management group). The ABCs for these non-assessed species are adjusted occasionally as species become assessed and are pulled out of management groups.

NOAA Fisheries has an internal review process, consisting of staff from Regional Science Centers and/or Office of Science and Technology, which provides a separate review of ABC control rule recommendations to ensure they would be consistent with stock status. While SEDAR stock assessments are peer reviewed, and NOAA Fisheries ensures the current process for establishing ACLs is based on the best scientific information available, NOAA Fisheries does not have an SSC for Secretarially-managed Atlantic HMS to review stock assessments, develop, and apply ABC control rules, and to make ABC recommendations for the stocks that they manage. The internal stock assessment review process ensures that the assessment and stock

status determination are scientifically valid and reflective of the current state of each stock and appropriately take into account the risk policy to rebuild the stock.

Under Management Option A1, NOAA Fisheries accounts for scientific uncertainty at an acceptable level given the biological characteristics of sharks and the risk policy as explained above. Management uncertainty is accounted for using AMs such as taking off any overharvest in the next fishing season, and only applying up to 50 percent of the underharvest to the next fishing season for healthy stocks.

Because this option does not utilize some of the flexible approaches in the NS1 guidelines that provide opportunities to better account for uncertainty and provide stability in the fisheries in establishing future ABCs, NOAA Fisheries does not prefer Management Option A1 at this time.

Management Option A2

Create a standardized ABC control rule.

Under Management Option A2, NOAA Fisheries would create a standardized ABC control rule for non-prohibited shark species and/or management groups. For shark stocks that have an assessment, NOAA Fisheries would set the standardized ABC control rule at a static percentage for each shark species and/or management group such as at 70 percent of the species' and/or management group's OFL. In cases where an assessment is not available, NOAA Fisheries would set the ABC to a standardized percentage of the average three-year harvest for sharks across all sectors (fishing groups). In cases where ICCAT has established a TAC, regardless of whether an assessment has been conducted, NOAA Fisheries would follow the ICCAT recommended TAC and set that as the ABC.

For many shark stock assessments, the inputs to the stock assessment model may not have a high degree of certainty. For example, one input into most stock assessment models is shark harvest. When considering shark harvests over time, those harvests can be highly variable from year to year. The specific reasons for this variation depend on the species, but can include incorrect species identification, changing market variability, and surveys (such as the Marine Recreational Information Program) that may not be best designed to account for rare event species like sharks. Ideally, an ABC control rule would account for this variability and would consider the uncertainty of the data for each species. Under this option, NOAA Fisheries would design a standardized ABC control rule that would account for both scientific uncertainty and could be set based on NOAA Fisheries risk policy for sharks (which is to use a 70-percent probability of success). The standardized ABC control rule would not be adjusted based on the specifics for each species and the uncertainty surrounding any species-specific stock assessment. For example, stocks that are not overfished (e.g., Gulf of Mexico blacktip sharks), stocks that are overfished (e.g., sandbar sharks), stocks with a recent stock assessment (e.g., smoothhound sharks), and stocks without a recent stock assessment (e.g., finetooth sharks) would all have the same ABC control rule. The ABC control rule would be a standardized percentage reduction in the OFL, such as 70 percent of the OFL.

An internal review process, consisting of staff from Regional Science Centers and/or Office of Science and Technology, would provide a separate review of ABC control rule recommendations to ensure the decisions would be consistent with stock status. While SEDAR stock assessments

are peer reviewed, and NOAA Fisheries ensures the current process for establishing ACLs is based on the best scientific information available, NOAA Fisheries does not have an SSC for Secretarially-managed Atlantic HMS to review stock assessments, develop, and apply ABC control rules, and to make ABC recommendations for the stocks that they manage. The internal stock assessment review process ensures that the assessment and stock status determination are scientifically valid and reflective of the current state of each stock and appropriately take into account the risk policy to rebuild the stock.

NOAA Fisheries does not prefer Management Option A2. This management option would limit management flexibility by creating a one-size-fits-all ABC control rule for all shark stocks without taking into consideration species-specific best scientific information available, which limits managers' ability to accurately manage those stocks. This approach assumes that scientific uncertainty would be similar for all managed shark species, regardless of stock status or data availability. NOAA Fisheries risk policy of setting the OFL at 70-percent probability of rebuilding or maintaining healthy status (for most shark stocks) already creates a standardized approach at determining an ABC.

Management Option A3—Preferred Management Option

Create a tiered ABC control rule.

Under Management Option A3, the preferred management option, NOAA Fisheries would adopt a tiered approach to appropriately consider differences in the available data and levels of uncertainty in the application of the ABC control rule.

The tier structure presented in Table 2 would place stocks to which the tier structure applies in a tier based on the available data, reliability of the data and modeling time series, the structure of a stock assessment, and the availability of key status determination criteria. These criteria include estimates of MSST, which is determined based on the natural mortality (M) and the biomass at maximum sustainable yield (B_{MSY}). Maximum sustainable yield (MSY) is the maximum long-term average yield that can be produced by a stock on a continuing basis. The biomass can fall below B_{MSY} without causing the stock to be declared overfished as long as the biomass is above MSST. The tiered ABC control rule would apply to any sharks with a stock status of healthy (i.e., not subject to overfishing and not overfished), experiencing overfishing, or unknown. For shark stocks with other statuses (overfished), or that are assessed or could be assessed by ICCAT or are in the prohibited shark complex, the ABC, where required, would be calculated outside of the tiered ABC control rule. Consistent with 50 CFR 600.310(j)(2)(i), upon notification that a stock or stock complex is undergoing overfishing, NOAA Fisheries would immediately begin working with Agency scientists and/or peer review processes to ensure that the ABC is set appropriately to end overfishing. NOAA Fisheries would evaluate the cause of overfishing, address the issue that caused overfishing, and reevaluate their ACLs and AMs to make sure they are adequate.

Each tier outlines the different processes and parameters for specifying OFL and ABC. Each tier accounts for scientific uncertainty in general (i.e., data-rich, data-moderate, and data-limited), and the tier determination and application is made on a stock-by-stock basis. The processes and parameters in each tier would be applied on a stock-by-stock basis, allowing for application of the uncertainty principles on a stock-by-stock basis. The ABC control rule would further account

for the risk of overfishing based on NOAA Fisheries' management risk policy as described below.

As stated in the NS1 guidelines, sources of uncertainty must be considered when establishing ACLs, including scientific uncertainty and management uncertainty. Scientific uncertainty refers to uncertainty in the information about a stock and its reference points, including the OFL (50 CFR 600.310(f)(1)(vi)). In general, an ABC control rule is a procedure for setting the ABC for a stock or stock complex as a function of the scientific uncertainty in the estimate of the OFL, any other scientific uncertainty, and a risk policy. The tiered ABC control rule for HMS shark stocks presented here is similar to the approaches taken by the Caribbean, Gulf of Mexico, and Pacific Fishery Management Councils (CFMC 2020; GMFMC 2011; PFMC 2020) and in a NOAA Technical Memorandum currently being developed (Courtney and Rice 2022). The Ralston et al. (2011) approach was used to estimate initial levels of scientific uncertainty by analyzing the historical variability in Atlantic shark stock assessments' estimates of population size for application in the tiered ABC control rule.

Under the Ralston et al. (2011) approach, NOAA Fisheries would conduct a meta-analysis (a statistical analysis that combines the results of multiple scientific studies) of information across assessments for Atlantic shark stocks that have been assessed multiple times (e.g., sandbar, blacktip, and Atlantic sharpnose sharks; Courtney and Rice 2022). Specifically, the meta-analysis would analyze the variability across those assessments, which indicates the amount of scientific uncertainty (sigma) across the assessment results. From this analysis, NOAA Fisheries would obtain a "pooled" estimate of scientific uncertainty in the stock assessment process. This estimate would provide an initial, minimum estimate of scientific uncertainty (sigma_min) for application in the ABC control rule. The sigma_min is the minimum amount of uncertainty to be used to calculate the reduction (buffer) from the OFL needed to obtain an ABC in tiers 1, 2, and 3. Each accepted assessment would also have its own sigma value reflecting an uncertainty estimate. When determining which estimate—the pooled estimate or the assessment-specific estimate—to use when calculating the ABC for each stock, NOAA Fisheries would choose the larger of the two values to be more precautionary around the scientific uncertainty. The selected scientific uncertainty estimate would be used to calculate the buffer from the OFL needed to obtain an ABC in Tiers 1, 2, and 3.

Consistent with the 2006 Consolidated HMS FMP, the HMS management risk policy for most Atlantic shark stocks is to ensure a 70-percent likelihood of success in ending and preventing overfishing, rebuilding overfished stocks, and maintaining healthy stocks, because most sharks have low reproductive potential, are long-lived, and have slow population growth rates. Within the existing risk policy, a range between 50- and 70-percent likelihood of success has also been considered depending on the stock and relevant circumstances. The corresponding acceptable probability of overfishing (P*) would be 30 percent for most stocks, although a range of between 30 and 50 percent could also be considered, consistent with the NS1 guidelines. In considering the appropriate P*, NOAA Fisheries would consider the specific characteristics and circumstances for a stock or stock complex, the fishery management objectives in the FMP, the specifics of the stock assessment models and any concern regarding model fit or other scientific uncertainty that scientists feel is or is not considered in the model, and other relevant information. For example, NOAA Fisheries might choose a different P* if the last year of data

used in the stock assessment was several years ago, if the fishery had changed how it operates since that last year of data, or if other extenuating circumstances happened that were not considered in the stock assessment to ensure success in ending and preventing overfishing. Overall, the HMS risk policy is intended to ensure that the ABC does not exceed the OFL. Amendment 14 does not change the HMS management risk policy.

Description of Each ABC Control Rule Tier

Table 2 provides an overview of the framework that NOAA Fisheries would use to calculate an ABC for shark stocks with a status of healthy (no overfishing/not overfished), experiencing overfishing, or unknown. Tiers 1 through 3 of the ABC control rule each requires inputs from an accepted shark stock assessment. An "accepted" shark stock assessment is one that has been approved by peer review scientists and determined by the Agency to meet the standards of a stock assessment. Tier 4 of the ABC control rule is for stocks without an accepted stock assessment.

Tier 1 stocks are those that are data-rich, with a full age-structured stock assessment (e.g., catch-at-age or catch-at-length model with sufficient life history data to fully parameterize the population dynamics) that includes, at a minimum, reliable time series of catch, size or age composition, and an index of abundance. These stock assessments would provide the following inputs or proxies for these inputs: MSST, MFMT, and OFL. The OFL (or the OFL proxy) is the annual catch amount that corresponds to the estimate of MFMT (or MFMT proxy) applied to a stock's or stock complex's abundance and is expressed in terms of numbers or weight of fish. The ABC is derived from the OFL (or the OFL proxy), reduced (buffered) as needed to account for both scientific uncertainty and the risk policy (i.e., reflect the acceptable probability of overfishing). After each Tier 1 assessment, an estimate of scientific uncertainty from the assessment (sigma), for example if available from stock assessment projections, would be compared to sigma_min. *See* explanation of Ralston et al. (2011) approach and description of sigma_min above. The larger of the two values would be used to estimate the uncertainty around the OFL. For Tier 1 stocks, consistent with the existing HMS risk policy for Atlantic shark stocks or complexes as stated above, NOAA Fisheries would apply an acceptable probability of overfishing occurring (P*) based on a range of 30 through 50 percent. This would be applied corresponding to a likelihood of success in ending and preventing overfishing and maintaining healthy stocks of 70 percent for most shark stocks, although a range between 50 and 70 percent may be considered depending on the stock and relevant circumstances.

Tier 2 stocks are those that are data-moderate (e.g., insufficient time series or life history data to fully parameterize catch-at-age or catch-at-length population dynamics) with a stock assessment that includes two of the three time series listed in Tier 1. The stock assessment provides estimates of MSST, MFMT, or OFL, or provides proxies for MSST, MFMT, or OFL. The methods to derive OFL and ABC are the same as the approach under Tier 1, but given the data-moderate considerations, a higher level of uncertainty (multiple of the sigma_min) would be used. Under Tier 2, the scientific uncertainty of the OFL is determined from either the larger value of the most recent assessment (sigma), for example if available from stock assessment projections, or 1*sigma_min through 2*sigma_min based on the stock assessment recommendations regarding overall stock assessment uncertainty. For Tier 2 stocks, consistent

with the HMS risk policy for Atlantic shark stocks, NOAA Fisheries would apply an acceptable probability of overfishing occurring (P*) based on a range of 30 through 50 percent. This would be applied corresponding to likelihood of success in ending and preventing overfishing and maintaining healthy stocks at 70 percent for most shark stocks, although a range between 50 and 70 percent may be considered depending on the stock and relevant circumstances.

Tier 3 stocks are those that are data-limited, with an accepted stock assessment that does not contain as much time series data as required for Tiers 1 and 2 but given the data-limited considerations, a higher level of uncertainty (multiple of the sigma_min) would be used. In Tier 3, the scientific uncertainty of the OFL is determined from either the larger value of the most recent assessment (sigma), for example if available from stock assessment projections, or greater than or equal to 2*sigma_min based on the stock assessment recommendations regarding overall stock assessment uncertainty. For Tier 3 stocks, consistent with the HMS risk policy for Atlantic shark stocks, NOAA Fisheries would apply an acceptable probability of overfishing occurring (P*) based on a range of 30 through 50 percent. This would be applied corresponding to a likelihood of success in ending and preventing overfishing and maintaining healthy stocks of 70 percent for most shark stocks, although a range between 50 and 70 percent may be considered depending on the stock and relevant circumstances.

As described above, the Ralston et al. (2011) methodology for determining sigma_min, as well as the methodology to determine OFL and sigma from each individual assessment, is highly technical. While NOAA Fisheries has worked through the process for stock assessments conducted using an integrated age-structured model (Stock Synthesis) (these assessments are anticipated to fall under Tier 1), the process for calculating OFL and sigma has not been completed for each previous individual data-moderate or data-limited assessment model (anticipated to fall under Tier 2 or Tier 3). As such, NOAA Fisheries is concerned that fully calculating the appropriate OFL and sigma to use for each stock that has already been assessed (using models other than Stock Synthesis) may cause inordinate delays in implementing the ABC control rule and could also have implications on the timing of ongoing and future stock assessments. In order to reduce such delays, NOAA Fisheries may phase in the changes from the ABC control rule for some shark stocks. Under this phased-in approach, any new stock assessment, including update assessments of previously assessed stocks, would provide the information necessary to fully calculate the scientific uncertainty needed to meet the requirements under this preferred alternative. For example, this process could start with the ongoing SEDAR 77 (Hammerhead Sharks Research Track Assessment) with the application of the ABC control rule for scalloped hammerhead, great hammerhead, and smooth hammerhead sharks and be peer-reviewed through the SEDAR process and CIE reviewers. Until a new stock assessment is completed or the methodology to obtain OFL and sigma has been developed for all previous stock assessment models, NOAA Fisheries generally would use the BSIA from the previous stock assessments to determine the appropriate OFL, ABC, and ACL for each shark stock. As needed, NOAA Fisheries will provide the details for the phased approach in the future rulemakings that implement the framework implemented in this document.

Tier 4 shark stocks are those for which an accepted stock assessment is not available, and therefore data quality and data availability have not been fully vetted through a stock assessment process that is subject to peer review. Because the data are not fully vetted, the figures needed to calculate OFL are not available and OFL is unknown. In such cases, an OFL proxy would be set

equal to the mean of reference period catch multiplied by a scalar less than or equal to three. Under Amendment 14, NOAA Fisheries would use three as the upper bound for the scalar, which is also what was adopted in Caribbean Fishery Management Council's Island-based FMP (CFMC 2020). However, the specific scalar would be derived from the data for the particular shark stock or stock complex, such as life history characteristics (e.g., productivity), susceptibility to fishing pressure, or other appropriate considerations (e.g., results of an ecological risk assessment) of the fishery for each shark stock. ABC would then be set at less than or equal to 90 percent of the OFL proxy, based on scientific uncertainty associated with data for the particular shark stock or stock complex. The reference period and appropriate scalar for the OFL proxy and the ABC would be established in a subsequent rulemaking for a particular stock or stock complex.

The OFL proxy, which can be considered to be a minimum estimate of MSY, is intended to account for variability around long-term catch and maintain a stock at a sustainable level until an accepted stock assessment can be determined. This approach provides the flexibility to consider the circumstances of each stock while also proposing an upper bound on the scalar.

Table 2. Calculating ABC for shark stocks with a status of healthy, experiencing overfishing, or unknown.

Tier Level	Condition of Use	Method to Determine OFL	Method to Determine ABC
1	Accepted data-rich stage-structured stock assessment approach (e.g., catch-at-age or catch-at-length model with sufficient life history data to fully parameterize the population dynamics) that includes, at a minimum, reliable time series of: (1) catch, (2) size or age composition, and (3) index of abundance. The assessment provides estimates of MSST, MFMT, and OFL or provides proxies for MSST, MFMT, and OFL.	OFL (or the OFL proxy) = catch at MFMT (or the MFMT proxy)[1]	ABC = OFL (or the OFL proxy) as reduced (buffered) as needed to account for scientific uncertainty[2] and reflecting the acceptable probability of overfishing[3].
2	Accepted data-moderate stock assessment approach (e.g., insufficient time series or life history data to fully parameterize catch-at-age or catch-at-length population dynamics) that includes two of the three reliable time series listed in Tier 1. The assessment provides estimates of MSST, MFMT, or OFL, or provides proxies for MSST, MFMT, or OFL.	OFL (or the OFL proxy) = catch at MFMT (or the MFMT proxy)[1]	ABC = OFL (or the OFL proxy) as reduced (buffered) as needed to account for scientific uncertainty[4] and reflecting the acceptable probability of overfishing[3] The ABC reduction would likely be greater than Tier 1[4].
3	Accepted stock assessment available, but the data used are relatively limited and do not meet the standards regarding time series set for Tiers 1 and 2. The assessment provides estimates of MSST, MFMT, or OFL or provides proxies for MSST, MFMT, or OFL.	OFL (or the OFL proxy) = catch at MFMT (or the MFMT proxy)[1]	ABC = OFL (or the OFL proxy) as reduced (buffered) as needed to account for scientific uncertainty[5] and reflecting the acceptable probability of overfishing[3] The ABC reduction would likely be greater than Tiers 1 and 2.
4	No accepted stock assessment available, and, therefore, data quality and data availability have not been fully vetted through an assessment process.	OFL is unknown. OFL proxy = mean of reference period[6] catch multiplied by a scalar ≤ 3, as refined per life history characteristics (e.g., productivity), susceptibility to fishing pressure, or other appropriate considerations (e.g., results of an ecological risk assessment).	ABC ≤ 90% of OFL proxy as determined by scientific uncertainty[7].

Note: For shark stocks with other statuses (overfished, assessed or could be assessed by ICCAT, or in the prohibited shark complex), the ABC, where required, would be calculated outside of the tiered ABC control rule.

[1] *See* 50 CFR 600.310(e)(2)(i)(D) (defining OFL as "annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.").

[2] Scientific uncertainty is based on the larger value of either the most recent stock assessment (sigma), for example if available from stock assessment projections or the pooled meta-analysis estimate from multiple Tier 1 assessments (sigma_min).

[3] Acceptable probability of overfishing determined by the HMS risk policy would take into account, but not be limited to, the species life history and ecological function.

[4] The ABC reduction could range from the larger value of either sigma, if available, or 1*sigma_min through 2*sigma_min.

[5] The ABC reduction could range from the larger value of either sigma, if available, or greater than or equal 2*sigma_min.

[6] Reference period to be determined on a stock or complex basis, based on life history characteristics, susceptibility to fishing pressure, or other appropriate considerations.

[7] The reduction from OFL proxy to ABC to take into account scientific uncertainty could include, but is not limited to, deficiencies in catch data, availability of ancillary data, species life history, ecological function, perceived level of depletion, and vulnerability of the stock to fisheries.

Shark Stocks outside the Tier Structure

As described above, some shark stocks do not fit into the tier structure and their ABCs would be calculated differently. In particular, the ABC for shark stocks that are under a rebuilding plan, assessed (or could be assessed in the future) by ICCAT's scientific body, or in the prohibited shark complex (Table 1 of Appendix A to 50 CFR part 635) would be calculated outside of these tiers.

Consistent with National Standard 1 guidelines, § 600.310(f)(3)(ii), overfished stocks and stock complexes must have a rebuilding ABC that reflects the annual catch is consistent with the schedule of fishing mortality rates (i.e., $F_{rebuild}$) in the rebuilding plan. Thus, for species in this category, a rebuilding ABC would be determined consistent with a stock's rebuilding plan, and outside the tier structure described above.

Some shark stocks are assessed internationally by the ICCAT, consistent with Article IV of the ICCAT Convention. ICCAT also has adopted management measures for shark stocks that are caught in association with ICCAT species (e.g., shortfin mako, silky sharks, oceanic whitetip sharks). For some ICCAT-assessed shark stocks caught in ICCAT fisheries, ICCAT has established conservation and management measures and has more recently established or considered establishing limits or quotas for stocks through binding recommendations under Article VIII of the Convention (e.g., North and South Atlantic blue sharks). As a member of ICCAT, and consistent with the Atlantic Tunas Convention Act, 16 U.S.C. § 971 et seq., the United States promulgates regulations, as necessary and appropriate, to implement binding ICCAT recommendations.

For many of these internationally-managed stocks, the United States catch constitutes only a small portion of fishing mortality on the stock. In such situations, the United States could not end overfishing or rebuild a stock on its own. The Magnuson-Stevens Act provides an exception from the ACL and AM requirement, which the NS1 Guidelines explain applies to stocks or stock complexes subject to management under an international agreement, which is defined as, "any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party.'" 50 CFR. § 600.310(h)(1)(ii) (citing Magnuson-Stevens Act section 3(24)). NOAA Fisheries determines application of this exception on a case-by-case basis. ABC is not required in such cases, but stocks would still need to have stock determination criteria, MSY and OY. *See* 50 CFR. §§ 600.310(h)(1)(ii), (e)(2)(i)(A)).

Recent amendments to the ICCAT Convention, which are not yet in force, have broadened the scope of the species covered by the Convention, including additional elasmobranchs that are oceanic, pelagic, and highly migratory. ICCAT Recommendation 19-01 lists which species of elasmobranchs will be considered oceanic, pelagic, and highly migratory and thus more clearly subject to direct management under Article VIII of the Convention. Until the ICCAT Convention amendments are in force, the following approach will be taken for shark stocks that are (e.g., blue shark) or that could be (e.g., thresher shark) assessed by ICCAT's Standing Committee on Research and Statistics (SCRS).

Specifically, if an ICCAT Recommendation provides a specific quota allocation to the United States, then NOAA Fisheries would implement that allocation, consistent with ATCA and also

considering consistency with Magnuson-Stevens Act requirements. If, however, ICCAT does not provide a specific allocation to the United States, NOAA Fisheries may decide to calculate an OFL proxy, if it determines that an ABC, ACL or other related measures are needed for the U.S. fishery for monitoring or other purposes, consistent with the Magnuson-Stevens Act. In those cases, NOAA Fisheries would use U.S. catch information from an appropriate reference period and take into consideration relevant ICCAT recommendations or resolutions, stock status information or trends if available, and other appropriate considerations. This OFL proxy calculation may scale the catch as refined per life history characteristics (e.g., productivity), susceptibility to fishing pressure, or other appropriate considerations (e.g., results of an ecological risk assessment). The resulting U.S. catch limit may be set equal to or less than the OFL proxy as determined by scientific uncertainty. Once the ICCAT Convention amendments are in force, NOAA Fisheries may revisit this approach.

For shark species that are prohibited (Table 1 of Appendix A to 50 CFR part 635), where the fisheries are closed and commercial and recreational retention and landings are not allowed, the ACL is set equal to zero, which NOAA Fisheries initially established in Amendment 3 and clarified in Amendment 5b (82 FR 16478; April 4, 2017). As stated above, NOAA Fisheries is not changing the approach to management of the prohibited shark complex.

Under preferred Management Option A3 and consistent with the guidelines for National Standard 2 (best scientific information available), NOAA Fisheries would continue to use the internal review process, consisting of staff from Regional Science Centers and/or Office of Science and Technology, which provides a separate review of ABC control rule recommendations. NOAA Fisheries would also continue to use SEDAR stock assessments for sharks, which are peer reviewed. The internal stock assessment review process ensures that assessments and stock status determinations are based on best scientific information available, scientifically valid and reflective of the current state of each stock or stock complex, and appropriately take into account the risk policy on preventing overfishing and/or rebuilding the stock.

Topic B: Phase-In Acceptable Biological Catch (ABC) Control Rule

The NS1 guidelines state, “Large changes in catch limits due to new scientific information about the status of the stock can have negative short-term effects on a fishing industry. To help stabilize catch levels as stock assessments are updated, a Council may choose to develop a control rule that phases in changes to ABC over a period of time, not to exceed three years, as long as overfishing is prevented each year (i.e., the phased-in catch level cannot exceed the OFL in any year). In addition, the Councils should evaluate the appropriateness of phase-in provisions for stocks that are overfished and/or rebuilding, as the overriding goal for such stocks is to rebuild them in as short a time as possible.” (600.310 (f)(2)(ii)(A)).

NOAA Fisheries prefers to use management options presented in the NS1 guidelines to increase management flexibility to phase-in changes to the ABC. This flexibility would allow NOAA Fisheries the ability to phase-in change to the shark fisheries to relieve economic impacts to the fishery and prevent market instability with a market surplus. NOAA Fisheries will still evaluate

each application in a stock-by-stock analysis at the time of implementation and determine the best process to rebuild the stock.

In the HMS shark stock context, a phase-in ABC control rule would allow the phase-in changes to the ABC over a period of time, not to exceed three-years, as long as overfishing is prevented and after evaluating the appropriateness of phase-in provisions for stocks that are overfished and/or rebuilding. A phase-in ABC control rule would allow NOAA Fisheries to have an increased level of flexibility to determine how the ABC for a particular species or management group is implemented and to help stabilize catch levels as stock assessments are updated to lessen negative short-term effects on a fishing industry.

Management Option B1

Maintain status quo. Do not use a phase-in ABC control rule for HMS stocks. Reduce ABC below OFL and/or to the level at which rebuilding or ending overfishing would occur.

Under Management Option B1, NOAA Fisheries would not implement a phase-in ABC control rule. The ABC would be implemented without phasing the ABC in over time, which is how shark ABCs are currently implemented. However, given the NS1 guidelines has afforded NOAA Fisheries additional flexibility for the phase-in of an ABC, NOAA Fisheries does not prefer Management Option B1 at this time.

Management Option B2—Preferred Management Option

Allow consideration of phase-in ABC control rules for modifications in ABC.

Management Option B2 would allow for consideration of using a phase-in ABC control rule for modifications to the ABC. NOAA Fisheries would have the option to phase-in a new ABC over up to three years, in a stepwise fashion, as outlined in the NS1 guidelines. Under this management option, any reduction or increase in ABC, regardless of stock status, could be phased in over a three-year period. During the three-year phase-in period, the ABC must remain under the OFL (the TAC if OFL is not offered in stock assessment) and NOAA Fisheries must prevent overfishing. NOAA Fisheries will still evaluate each application of an ABC phase-in on a stock-specific basis to determine the best process to rebuild the stock.

Under preferred Management Option B2, NOAA Fisheries would follow guidelines for using the phase-in provision as laid out in the NS1 guidelines. Specifically, when considering the appropriateness of applying a phase-in ABC control rule for a stock or management complex, NOAA Fisheries would ensure that the resulting ABC prevents overfishing (i.e., ABC cannot exceed OFL). The ABC control rules would be based on a comprehensive analysis that shows how the control rule prevents overfishing (50 CFR 600.310 (f)(2)(i)). The impact of phase-in on a stock's rebuilding progress would be considered, as the overriding management goal for stocks in a rebuilding plan is to rebuild them in as short a time as possible.

If a phase-in ABC control rule has been determined to be appropriate to achieve a needed reduction in ABC based on scientific advice, NOAA Fisheries would implement the phase-in ABC provision by setting the year one ABC at a level below the OFL. In year two, NOAA Fisheries would set the ABC at 50 percent of the difference between the OFL and the

recommended ABC. Finally, in year three, NOAA Fisheries would set the ABC at the recommended level. NOAA Fisheries believes this could be the best method for sharks due to the high variability in shark stock assessments.

Conversely, if NOAA Fisheries determines that a phase-in approach is appropriate for an increase in ABC, NOAA Fisheries would implement the phase-in ABC provision by setting the year one ABC at 25 percent of the difference between the current ABC and recommended ABC. In year two, NOAA Fisheries would set the ABC at 50 percent of the difference, and in year three, it would set the ABC at the recommended level.

NOAA Fisheries prefers this management option because it increases the flexibility in how NOAA Fisheries implements ABCs after stock assessments. Since many shark stocks are unassessed and/or in an unknown stock status, these shark stocks could see a significant change in ABC after they are assessed. NOAA Fisheries prefers to have the flexibility to phase-in large changes, allowing stakeholders additional time to adjust to reduced ABCs and stakeholders, including markets, to adjust to increased ABCs. NOAA Fisheries recognizes that this approach may have limited impacts on the health of a stock during the phase-in period, but the fishery would be managed below the OFL during the phase-in period and could lead to more stable fisheries over time. However, these impacts would need to be analyzed on a stock by stock basis during relevant rulemakings, prior to implementation of a phase-in ABC.

Management Option B3

Use a phase-in ABC control rule for healthy shark stocks; no phase-in for overfished/overfishing stocks.

Under Management Option B3, NOAA Fisheries would use a phase-in provision for the ABC control rule only if the stock is healthy (not overfished and no overfishing is occurring). NOAA Fisheries would implement the full ABC in one year/step if an assessment determines a stock to be overfished and/or overfishing is occurring.

A stock assessment may determine that a stock is healthy (not overfished and overfishing is not occurring), but needs a reduction in mortality to maintain the stock status. If a stock is healthy, a phase-in approach may not have a detrimental impact as long as the total catch remains below the OFL. This management option should not cause long-term harm to the stock since the stock is not overfished, and therefore, would not slow a rebuilding timeline or impact any biological stock characteristics. However, any stocks determined to utilize a phase-in ABC control rule would require a detailed impact analysis prior to implementation of the control rule.

This option would also allow for phase-in for an increase in the ABC if the stock is determined to be healthy. As with option B2, this option would help stabilize market conditions and avoid creating a market surplus due to large increases of an ABC. NOAA Fisheries does not prefer this management option because it would limit management flexibility to appropriately react to changes in stock status and changes in allowable harvest levels within the fishery. Additionally, the limited flexibility may have detrimental economic impacts to the fishery.

Management Option B4

Use a phase-in ABC control rule, unless the stock is overfished with overfishing occurring.

Under Management Option B4, NOAA Fisheries would implement the full ABC in one year/step if an assessment indicates a stock to be overfished with overfishing is occurring. In the event a stock is not overfished with overfishing occurring, then NOAA Fisheries would have the option to phase-in the reduced ABC to allow for more management flexibility as needed.

Stocks that are both overfished and experiencing overfishing are stocks in which the fishing mortality is too high and the stock biomass is too small to replace losses. If the stock is overfished and experiencing overfishing, it is not achieving MSY or OY. Thus, NOAA Fisheries would implement the necessary ABC as soon as possible to help rebuild the stock and end overfishing. This option would only allow for a phased-in approach if the stock is determined to be healthy and the ABC is to be increased. Gradually increasing the ABC would also help stabilize market conditions and avoid creating a market surplus due to large increases of an ABC.

NOAA Fisheries does not prefer this management option because it would not allow management flexibility to appropriately react to stock status and would not help reduce economic impact of having a large reduction in a single year's catch limits and thus would not address potential instability in the fishery.

Topic C: Annual Catch Limit Development

The NS1 guidelines state, "If sector-ACLs are used, sector-AMs should also be specified. 'Sector,' for purposes of this section, means a distinct user group to which separate management strategies and separate catch quotas apply. Examples of sectors include the commercial sector, recreational sector, or various gear groups within a fishery. If the management measures for different sectors differ in the degree of management uncertainty, then sector-ACLs may be necessary so that appropriate AMs can be developed for each sector. If a Council chooses to use sector-ACLs, the sum of sector-ACLs must not exceed the stock or stock complex level ACL. The system of ACLs and AMs designed must be effective in protecting the stock or stock complex as a whole. Even if sector-ACLs and sector-AMs are established, additional AMs at the stock or stock complex level may be necessary." (600.310(f)(4)(ii)).

An ACL is a limit on the total annual catch of a stock and/or stock complex, which cannot exceed the ABC that serves as the basis for invoking AMs. An ACL may be divided into sector-ACLs. ACLs are used as a limit on a sector or stock to prevent overfishing. As a result of the modified ABC control rule provisions in the NS1 guidelines, NOAA Fisheries has determined that it is appropriate to review the ACL framework for shark stocks that is currently used and was established in Amendment 3. Because the various user groups within the fishery and management measures for the different sector-ACLs differ so much, NOAA Fisheries is considering an option to actively manage the sectors (commercial and recreational) and have management and AMs based on separate mortality estimates.

Management Option C1

No Action. No change to the current mechanism for determining ACLs.

Under Management Option C1, NOAA Fisheries would maintain the existing process for determining the ACL for all shark species and/or management groups, which was established in Amendment 3 to the 2006 Consolidated HMS FMP (Figure 1). NOAA Fisheries has, in practice, set the ABC, OFL, and overall ACL equal to the TAC (TAC=OFL=ABC=ACL). The TAC usually is provided as part of the stock assessment report, results, and/or conclusions, and determines the level of acceptable mortality, given the biological characteristics of the species that would allow a stock to rebuild or remain sustainable for a given timeframe. For overfished stocks, in most cases, the ACL is equal to the stock assessment's projection that shows rebuilding with a 70-percent chance of success within an acceptable rebuilding timeframe. NOAA Fisheries currently uses the 70-percent probability of rebuilding for sharks given their life history traits, such as late age of maturity and low fecundity (instead of 50-percent, which is commonly used for other species), with some limited exceptions made on a case-by-case basis. The 70-percent rebuilding threshold is consistent with NOAA Fisheries' risk policy for shark species.

Additionally, Amendment 3 established three "sector-ACLs" for 1) recreational harvest (landings and discards), 2) commercial discards, and 3) commercial landings. The commercial discard sector ACL includes discard estimates within HMS managed fisheries and from fisheries that are not managed as part of the HMS fishery management plan to ensure that all mortality is included. The discard estimates are currently calculated during a stock assessment. The commercial landings ACL is the commercial shark quota for specific shark fisheries. It is calculated by removing the recreational and commercial discard estimates from the TAC received from the stock assessment. The commercial shark landing quota also has AMs where the shark fishery closes when the landings have reached or are projected to reach 80 percent of the commercial quota (only if NOAA Fisheries determines that the commercial quota would be exceeded by the end of the year), which is the annual catch target (ACT).

Landings and discards of recreational ACLs are determined when a stock assessment is conducted. These numbers are used as the annual recreational mortality estimates in the interim years between stock assessments due to the paucity of recreational landings and discard data for most shark species obtained through various regional recreational surveys conducted by federal and state agencies. To date, active inseason monitoring of recreational shark landings and discards is not conducted, as it is difficult to do outside of stock assessments. The commercial landings ACL is the only ACL for sharks that is actively monitored and adjusted each year.

More details on these calculations and the establishment of specific TACs and ACLs can be found in the amendments to the 2006 Consolidated HMS FMP: Amendment 2 (2008), Amendment 3 (2010), Amendment 5a (2013), Amendment 6 (2015), and Amendment 9 (2016). The specific ACLs for sharks are in Table 3.

Table 3. Total Allowable Catches and Annual Catch Limits (mt dw) of Current Shark Management Groups.

Fishery	TAC = ACL	Commercial Sector ACL	Recreational Sector ACL	Dead Discard Sector ACL
Aggregated LCS–Atlantic	346.2	204.6	147.1	N/A
Aggregated LCS—Eastern Gulf of Mexico	175.2	103.6	71.7	N/A
Aggregated LCS—Western Gulf of Mexico	147.6	87.2	60.4	N/A
LCS shark research fishery	50.0	50.0	N/A	0
Blacktip—Gulf of Mexico	413.4	256.6	60.3	96.2
Blacktip—Eastern Gulf of Mexico	40.5	25.1	5.9	9.4
Blacktip—Western Gulf of Mexico	372.9	231.5	54.4	86.7
Hammerhead—Atlantic	41.2	27.1	2.5	11.4
Hammerhead—Eastern Gulf of Mexico	20.4	13.4	1.3	5.6
Hammerhead—Western Gulf of Mexico	18.1	11.9	1.1	5.0
Sandbar	158.3	90.7	27.0*	40.6*
Non-blacknose SCS—Atlantic	489.3	264.1	100.6	122.4
Non-blacknose SCS—Gulf of Mexico	999.0	112.6	66.2	818.7
Blacknose—Atlantic	21.2	17.2	0.4	3.5
Blacknose—Gulf of Mexico	34.9	0	2.6	32.3
Prohibited species	0	0	0	0
Pelagic shark complex	488.0	Undefined	Undefined	Undefined
Porbeagle shark	11.3	1.7	0.1	9.5
Blue shark	279.0	Undefined	Undefined	Undefined
Smoothhound—Atlantic	1,430.6	1,201.7	188.4	39.1
Smoothhound—Gulf of Mexico	509.6	336.4	0.6	169.8

Note: mt dw = Metric tons dressed weight; LCS = Large coastal shark; SCS = Small coastal shark. *NOAA Fisheries discovered a typographical error and has updated the sandbar shark TAC accordingly, which did not impact the shark research fishery.

NOAA Fisheries does not prefer this management option because the current mechanism for establishing an ACL is based on the older NS1 guidelines from 2009 without considering options for management presented in the 2016 guidelines. In light of the NS1 guidelines, NOAA Fisheries is considering revising the shark fisheries ABC framework established in Amendment 3 (including modifying the ABC control rule (Topic A), phasing in the implementation of an ABC (Topic B), and modifying carry-over, phase-in and multi-year overfishing provisions (Topics D and E)) in order to update fishery management regulations to improve the health of shark stocks and the fishery. Thus, after reviewing the NS1 guidelines, NOAA Fisheries has determined that it is appropriate to consider changes for setting and managing ACLs at this time.

Management Option C2—Preferred Management Option

Actively manage all sector ACLs (commercial and recreational).

Under Management Option C2, the preferred management option, the overall ACL would be split into two different sector ACLs (commercial and recreational) as described in Figure 4. The revised framework would only apply to non-prohibited sharks. In cases where ICCAT has established a TAC, regardless of whether an assessment has been conducted, NOAA Fisheries would follow the ICCAT recommended TAC and set that as the ABC. The overall ACL would

be set below the ABC to account for management uncertainty. Management uncertainty includes, but is not limited to, shark mortality from fisheries not managed directly by the NOAA Fisheries HMS Management Division and any research mortality. This overall ACL would be further divided into commercial and recreational fishery sector ACLs, which would be determined in subsequent FMP amendments or regulatory actions.

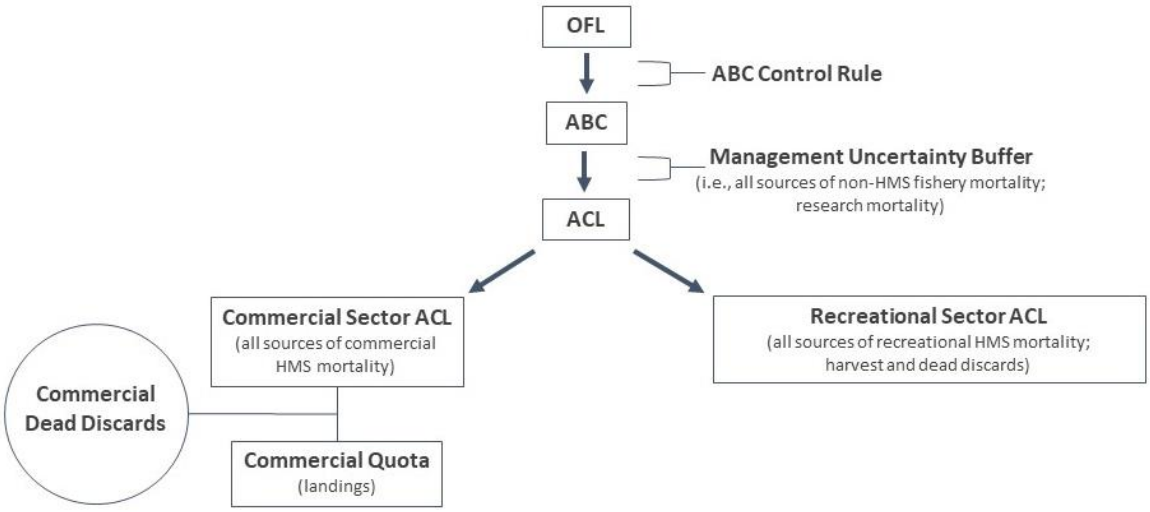


Figure 4. The Annual Catch Limit Framework for Non-Prohibited Shark Species under Preferred ACL Development Management Option C2.

Note: The ABC control rule is determined based on preferred Management Option A3

For the commercial ACL, NOAA Fisheries would manage commercial quotas and account for HMS commercial fishery dead discards. Currently, commercial quotas are actively managed and monitored through electronically submitted dealer reports on a weekly basis to ensure quotas are not exceeded. As for the commercial dead discards, NOAA Fisheries initially receives estimates during stock assessments. These commercial dead discard estimates include HMS fisheries and non-HMS fisheries (e.g., snapper-grouper fishery, menhaden fishery, and shrimp trawl fishery). Before Amendment 14, all of the commercial dead discards were removed from the overall ABC and estimates were used as a proxy for mortality that must be annually accounted for until a subsequent stock assessment updates the estimates. Under this management option, the commercial dead discards would include all shark fishery mortality (estimated dead discards and/or post release mortality) associated with the shark management group and/or species. As described below, these estimates would be accounted for annually based on a three-year average of fishing mortality estimates before setting a commercial quota. Shark mortality that occurs outside of HMS fisheries would be accounted for through the management uncertainty buffer set between the ABC and overall ACL. This would ensure that the mortality counted against the ACL matches the mortality used in the assessment to calculate the OFL or TAC.

To calculate the commercial dead discards for years when a stock assessment is not conducted, NOAA Fisheries would compile observer data, logbook data, and work with the SEFSC to determine these estimates. The most recent year of dead discard estimates would have the highest levels of uncertainty due to the potential of late reports, incomplete surveys, and unverified data. In addition, many shark species are rarely observed, which could result in large confidence intervals in mortality estimates. Since some of the data (observer and logbook) are

not finalized until after the start of the following year and annual estimates of catch and interactions are variable year to year, NOAA Fisheries would revise the commercial dead discard estimate based on the most recent past three complete years of data. For example, the 2023 commercial dead discard estimate for a shark species and/or management group would be based on dead discard data from 2019 through 2021, and the 2024 commercial dead discard estimate would be based on data from 2020 through 2022. NOAA Fisheries believes actively managing and adjusting the dead discard estimates based on a rolling three year average would be the best method to handle variability in the shark fishery. NOAA Fisheries chose the three-year period to be consistent with the three-year phase-in provision in the NS1 guidelines, and using data from the most recent three years would provide an updated representation of the discard estimates in the fisheries outside of a stock assessment.

If NOAA Fisheries adjusted the dead discard estimate based on one year of data, the annual estimates could result in large annual adjustments in the fishery that may well be unwarranted given the lack of precision in the data. Thus, it would be beneficial for NOAA Fisheries to base any management decisions on multiple years of data to help smooth out the large levels of variability in these estimates.

If the shark species and/or management group has not been assessed, NOAA Fisheries would identify those sources of mortality by reviewing observer and logbook data in HMS and non-HMS fisheries. Once NOAA Fisheries identifies those sources of mortality, the dead discard estimates would be calculated in the same manner as described above.

Regarding underharvest of the commercial ACL, NOAA Fisheries is considering some management options below. The preferred option (Management Option D6) would allow only underharvest from the commercial sector to be eligible for carry-over. Any unused quota would be added to the next year's commercial quota for any management group as long as the overall ACL remains below the ABC. For overharvest, NOAA Fisheries would reduce the commercial ACL to account for the overharvest. This would reduce next year's commercial quota for any management group.

For the recreational ACL, NOAA Fisheries would actively monitor the overall recreational fishing mortality. This would include accounting for the harvest and dead discard estimates for the shark management group and/or species within the recreational fishing sector. Currently, NOAA Fisheries calculates the recreational mortality through a stock assessment and removes this mortality estimate from the overall OFL for the shark species/complex. Similar to commercial dead discards, the recreational mortality estimate from a stock assessment is used as a proxy, where the same mortality estimate is removed from the ACL every year, until the next stock assessment provides more accurate mortality estimates. The data on recreational mortality for Atlantic sharks is obtained through various regional recreational surveys conducted by federal and state agencies. These surveys provide estimated (i.e., extrapolated) numbers of shark interactions based on data provided by anglers and captains. The data used to establish the recreational ACL would match the recreational data source(s) used in the relevant stock assessment (e.g., if the stock assessment used Large Pelagics Survey (LPS) data, the recreational ACL would also use LPS data, and not use Marine Recreational Information Program (MRIP) data or other sources).

Given the high annual variability of recreational harvest and mortality, NOAA Fisheries would continue to collect recreational estimates through various regional recreational surveys conducted by federal and state agencies. The recreational ACL would be adjusted annually based on data from the past three years. Using a multi-year average would be similar to the approach for estimating commercial dead discards. The most recent year of harvest and dead discard estimates would have the highest levels of uncertainty due to potentially late reports, incomplete surveys, and unverified data. In addition, many shark species are rarely observed in recreational surveys, resulting in large confidence intervals in harvest and mortality estimates. Using such data for annual estimates could result in large annual adjustments in the fishery that may well be unwarranted given the lack of precision in the data. Thus, it would be beneficial for NOAA Fisheries to base any management decisions on multiple years of data to help smooth out the large levels of variability in these estimates. For example, the 2023 recreational ACL for a shark species and/or management group would be based on consideration of all recreational estimate data from 2019 through 2021 and the 2024 recreational ACL would be based on data from 2020 through 2022.

Regarding underharvest and overharvest of the recreational ACL, NOAA Fisheries would consider management measures to limit mortality by adjusting the bag limits, size limits, gear restrictions, and/or other measures as appropriate on a stock-specific basis the following fishing season based on the three-year average of fishing mortality estimates, which again was chosen to be consistent with the three-year phase-in provision in the NS1 guidelines, and because using data from the most recent three years would provide an updated representation of the recreational harvest and mortality in the fisheries outside of a stock assessment. For example, in a situation where a healthy shark management group's recreational ACL is not fully harvested, NOAA Fisheries could increase bag limits or reduce size limits to increase fishing opportunities through the annual specifications or inseason action. If that same healthy shark management group ACL is overharvested, bag limits could be reduced, size limits increased, or area/season restrictions could be implemented.

NOAA Fisheries prefers this management option because it allows for the commercial and recreational sectors to be actively managed and have management and AMs, based on separate mortality estimates. As mentioned above, NOAA Fisheries monitors mortality in the commercial and recreational sectors differently. In the December 2020 HMS Advisory Panel meeting, the members indicated that they would support divisions in the ACLs between the sectors so that there is a reasonable expectation of allocation on a yearly basis. Management Option C2 would provide each sector with a percentage of quota, which would not change unless the overall ACL was exceeded.

Management Option C3

Establish a "reserve" sector ACL; develop mechanisms for inseason transfer.

In Management Option C3, NOAA Fisheries would create a "reserve" sector ACL, which would be subtracted from the overall Shark Fisheries ACL. Similar to the Atlantic bluefin tuna fishery, the "reserve" sector ACL would be an amount held in reserve for inseason transfers, annual adjustments, and/or research. The "reserve" sector ACL amount would be developed based on management uncertainty to ensure that the overall harvest from all sectors does not exceed the ABC. NOAA Fisheries would develop criteria to determine the appropriate quota distribution

from the reserve sector. The "reserve" sector ACL would create a buffer between the ABC and the overall ACL, thus allowing for adjustments resulting from any over- or underharvests. Due to the reporting and data quality of each sector ACL, NOAA Fisheries would develop a mechanism for inseason transfer every two years. This would allow NOAA Fisheries time to ensure all the mortality is accurately accounted for and the overall ACL was not exceeded.

NOAA Fisheries does not prefer this management option at this time because transferring from the "reserve" sector ACL to any other sector ACL would not be on a seasonal basis (January 1 through December 31). If NOAA Fisheries created a "reserve" sector ACL, it would be difficult to appropriately distribute to the commercial and recreational sector ACLs during the season, as mortality estimates from commercial dead discards and recreational harvest would not be available until after a fishing year ends. Even under the preferred Management Option C2, a "reserve" sector ACL would have little benefit regarding making quota available to the fisheries during a given season due to the lags in receiving discard and recreational sector data. While the "reserve" sector ACL could create an additional buffer for the OFL, NOAA Fisheries does not prefer this management option at this time.

Management Option C4

Establish an ACL for each shark complex (combining management groups) as a whole, without a focus on individual species.

Management Option C4 would establish an overall ACL for each management group as a whole rather than for individual species. This would combine all the shark species that are often caught together with the same gear type and/or similar ecological conditions into larger management groups. This is how the Atlantic HMS management groups were established in 1993 (LCS, SCS, and pelagic shark complexes). Under this management option, NOAA Fisheries could create a Gulf of Mexico LCS complex by combining the blacktip, aggregated LCS, and hammerhead shark management groups, and an Atlantic LCS complex by combining the aggregated LCS and hammerhead shark management groups. For the SCS complex, NOAA Fisheries could combine the non-blacknose SCS and blacknose shark management groups and create separate regional groups. For the pelagic shark complex, NOAA Fisheries could combine the blue, porbeagle, and other pelagic shark management groups together.

For example, the Atlantic aggregated LCS quota (168.9 mt dw) would be combined with the Atlantic hammerhead shark quota (27.1 mt dw) for an Atlantic LCS complex quota of 196 mt dw. NOAA Fisheries would monitor the overall LCS landings in the Atlantic region without setting individual species quotas. NOAA Fisheries would implement management measures (i.e., retention limits, opening dates) for the whole LCS complex.

NOAA Fisheries does not prefer this management option because NOAA Fisheries would not be able to use the best available science to manage each shark species and ensure OFLs recommended from stock assessments for individual species and the resulting ABCs are not exceeded. When the shark species are combined into large complexes, NOAA Fisheries would not be able to implement specific management measures to ensure the rebuilding of the shark species based on information from stock assessments that are significantly different than what is currently in place for the management of Atlantic sharks. Management measures implemented

for the larger complex could not limit landings for individual shark species stocks, potentially leading to overfishing of the more vulnerable stocks.

Management Option C5—Preferred Management Option

Establish an ACL for each Atlantic shark management group, without commercial ACL quota linkages.

Under Management Option C5, NOAA Fisheries would establish an ACL for each existing shark management group or species and remove commercial management group linkages. NOAA Fisheries manages the Atlantic shark fishery based on ACLs established for each shark management group or species through FMP amendments (Table 3). Currently, NOAA Fisheries manages each Atlantic shark management group or species to a specific commercial ACL, with some linkages among shark management groups whose species are often caught together, to prevent exceeding the established quotas through discarded bycatch. Once one of the linked quotas is reached, both management groups are closed regardless of the remaining quotas. For example, the commercial hammerhead shark management group ACL is linked to the commercial aggregated LCS management group ACL. Both of these management groups close together, after one of the commercial landings have reached or are projected to reach 80 percent of the available overall, regional, and/or sub-regional quota, if the commercial fishery's landings are not projected to reach 100 percent of the applicable quota before the end of the season.

Under Management Option C5, NOAA Fisheries would change the current management structure in the HMS fishery. To ensure ACLs are not exceeded, NOAA Fisheries would need to account for all potential mortality when the commercial ACL species linkages are removed. NOAA Fisheries would ensure that any discarded bycatch that may occur when the fishery remains open would be accounted for in the commercial dead discard estimates. In this case, the assumed discards would be increased to cover any additional mortality, and it could potentially reduce the commercial ACL quotas for the fishery.

NOAA Fisheries prefers Management Option C5 because the fisheries could remain open all year to ensure that each shark management group or species quota is fully utilized. However, once an ACL is reached, NOAA Fisheries would close that fishery to prevent overharvesting. This was the case with the SCS fishery in the Atlantic region from 2013 to 2017, before management measures changed to implement a retention limit for blacknose sharks. However, NOAA Fisheries would still account for the dead discards after a shark management group is closed and this potential increase in estimated mortality could reduce commercial quotas.

While NOAA Fisheries considered keeping the current management structure with commercial ACL species linkages, NOAA Fisheries does not prefer keeping quota linkages since historically commercial ACL quota linkages have negatively impacted the fishery and closed seasons earlier than would otherwise be necessary. ACL species linkages were established to minimize discards in the shark fishery. Because NOAA Fisheries would be actively monitoring those discards and adjusting the commercial sector ACL appropriately, removing this AM would increase the opportunity to utilize the available commercial quotas. The monitoring provisions would ensure that ACLs were adhered to achieve conservation objectives. In all of the quota linkages, one shark management group has a larger quota than its linked shark management group. Once one of the linked quotas is reached, both management groups are closed regardless of the remaining

quotas. Since NOAA Fisheries started implementing commercial ACL quota linkages in the shark fishery in Amendment 5a to the 2006 Consolidated HMS FMP (78 FR 40317; July 3, 2013), 13 shark management groups through 2021 were closed early due to quota linkages. The remaining under-utilized commercial ACL quota from 2013 to 2021 from the 13 shark management groups accounts for 522.7 mt dw, which has been lost to the commercial fishery. In addition, commercial ACL quota linkages have caused fishermen to discard shark species to ensure that certain fisheries remain open longer.

Management Option C6

Create species-specific ACLs with commercial ACL quota linkages.

Under Management Option C6, NOAA Fisheries would create species-specific ACLs, independent of linkages to other species. NOAA Fisheries could also consider species linkages for each species-specific commercial ACL. Currently, some shark species are managed in a management group (aggregated LCS, hammerhead, non-blacknose SCS, pelagic sharks). Under this management option, each species of shark would have its own ACL. For example, each Atlantic region aggregated LCS management group species (blacktip, bull, lemon, nurse, silky, spinner, and tiger shark) and hammerhead shark management group species (great, scalloped, and smooth) would be managed separately with its own ACL. Because there have not been stock assessments for each of these shark species, the ACLs could be based on average mortality. In addition, NOAA Fisheries could consider quota linkages for the species-specific ACLs or not linking the ACLs. If the ACLs are linked, then when one species' commercial ACL is reached, the other linked species' commercial fishery would also close, potentially resulting in an underutilization of that species' quota.

NOAA Fisheries does not prefer this management option at this time because of the administrative difficulties in establishing and monitoring numerous species-specific ACLs, the confusion that could be caused from multiple species openings and closures, and the potential misidentification of shark species by fishermen. NOAA Fisheries allows commercial and/or recreational harvest on 27 different stocks. Monitoring and managing that number of species-specific ACLs would be an administrative burden on the Agency. This option could also cause confusion among stakeholders from multiple species openings and closures. Further, some assessed species have group TACs recommended by the scientists because of identification issues (e.g., Gulf of Mexico smoothhound sharks). In addition, other species have not been assessed in a formal stock assessment and lack data to create species-specific ACLs. For instance, NOAA Fisheries created the hammerhead shark management group in Amendment 5a to the 2006 Consolidated HMS FMP due to the difficulty in differentiating hammerhead shark species, especially when dressed (heads removed). Therefore, NOAA Fisheries combined hammerhead sharks into a management group and counted all of the landings towards one quota to address the issue. If all three large hammerhead sharks are not grouped under one quota, some scalloped hammerhead sharks could be misidentified as smooth or great hammerhead sharks and would not be appropriately accounted for, possibly leading to mortality in excess of the scalloped hammerhead ACL. In addition, establishing and monitoring numerous species-specific ACLs would cause administrative difficulties and potentially cause delays in timely management measures.

Topic D: Carry-Over of Underharvested ACL

The NS1 guidelines state, "ABC control rules may include provisions for the carry-over of some of the unused portions of an ACL (i.e., an ACL underage) from one year to increase the ABC for the next year, based on the increased stock abundance resulting from the fishery harvesting less than the full ACL. The resulting ABC recommended by the SSC must prevent overfishing and must consider scientific uncertainty consistent with the Council's risk policy. Carry-over provisions could also allow an ACL to be adjusted upwards as long as the revised ACL does not exceed the specified ABC. When considering whether to use a carry-over provision, Councils should consider the likely reason for the ACL underage. ACL underages that result from management uncertainty (e.g., premature fishery closure) may be appropriate circumstances for considering a carry-over provision. ACL underages that occur as a result of poor or unknown stock status may not be appropriate to consider in a carry-over provision. In addition, the Councils should evaluate the appropriateness of carry-over provisions for stocks that are overfished and/or rebuilding, as the overriding goal for such stocks is to rebuild them in as short a time as possible" (600.310 (f)(2)(ii)(B)).

Based on the NS1 guidelines, NOAA Fisheries is considering developing carry-over provisions, permitting underharvests in one year to be added to the allowable catch in a subsequent year. Underharvest may be the result of a variety of factors, including changes in effort, fish availability, socioeconomic constraints, and/or regulatory constraints. Since HMS-managed shark stocks do not have annual stock assessment updates, it would not be possible to update projections for potential increases in stock biomass due to underharvests. Therefore, calculating appropriate increases in the ABC is not currently feasible. Thus, the range of management options below are constrained to applying a carry-over approach if the ACL is lower than the ABC and there is an underharvest. Consistent with the NS1 guidelines, NOAA Fisheries may account for underharvests by adjusting the next year's ACL upwards (by adding all or part of the underharvest) as long as the ACL that is adjusted with the underharvest does not exceed the pre-specified ABC.

In all instances, as is done now, carry-over would not be available for stocks that are overfished or experiencing overfishing; this limitation on possible carry-over would help ensure that any potential underharvest would contribute to improving the status for stocks in those conditions.

Management Option D1

No Action. Allow up to 50 percent carry-over of the commercial landings sector ACL if a stock is not overfished, not experiencing overfishing, or not in an unknown status.

Under Management Option D1, NOAA Fisheries would maintain the status quo where the carry-over of the underharvest of a commercial landings sector ACL of shark stocks would be based on the individual shark species' stock status. For shark stocks that are not overfished or are not experiencing overfishing, underharvest from the previous commercial sector-fishing year for that particular stock would be added to its base commercial sector ACL in the following year to create an "adjusted" commercial sector ACL. This carry-over of the underharvest currently only applies to the Gulf of Mexico blacktip shark, Gulf of Mexico smoothhound shark, and Atlantic smoothhound shark stocks. The underharvest carry-over would continue to be capped at 50

percent of the base ACL for the commercial landings sector, which would limit the amount of underharvest that could be applied in the subsequent fishing year, to protect healthy species and prevent quota stockpiling. The carry-over of underharvest of an ACL would only occur for commercial ACLs.

NOAA Fisheries has not traditionally actively monitored recreational harvest of sharks on an inseason or annual basis. As such, the recreational sector ACL has not needed to be adjusted as a result of any carry-over of any underharvest. Instead, NOAA Fisheries has used the harvest levels and discards provided during stock assessments to adjust the recreational sector ACL when needed. This approach is used due to the large uncertainty in the estimates of recreational harvest and discard data for most shark species.

Under Management Option D1, NOAA Fisheries would not apply carry-over of underharvests for individual species that have an unknown stock status, are overfished, or are experiencing overfishing. Further, if any species within a complex has a stock status determination of unknown, overfished, or experiencing overfishing, then carry-over of underharvest would not be applied to the complex's ACL. By not allowing carry-over for these stocks, any underharvest would contribute to improving stock status.

NOAA Fisheries does not prefer Management Option D1 since this option would only allow underharvest carry-over to three shark stocks (Gulf of Mexico blacktip shark, Gulf of Mexico smoothhound shark, and Atlantic smoothhound shark). Currently, most of the commercial shark quotas are underharvested. In addition, there are no current HMS regulations that require shark fisheries to stay below the ACL or the ABC, which is inconsistent with the NS1 guidelines. This option does not utilize available quotas and ACLs, and likely would contribute to continued underharvests.

Management Option D2

Distribute any unused catch to the sector where the underharvest occurs, provided the overall ACL does not exceed ABC.

This option would distribute any unused catch to the sector ACL (i.e., commercial or recreational) where the underharvest occurred. The underharvest would be carried over to that sector in the following year, as long as the overall ACL does not exceed the ABC. The distribution back to the underharvested sector would encourage equity in disbursement and would only have an effect on the sector that did not fully utilize their ACL. Because the overall ACL must remain under the ABC, it is possible that only a portion of the underharvest would be carried over.

For example, if the commercial sector ACL for one management group was fully utilized, and the recreational sector ACL for that same management group was underharvested by 25 mt dw, NOAA Fisheries would redistribute the underharvest back to the recreational sector ACL in the next fishing year, as long as the overall ACL does not exceed ABC. Thus, the following fishing season the commercial sector ACL of this management group would be the same as the previous fishing season, while recreational sector ACL would be increased by 25 mt dw.

This option is not preferred because there is less confidence in the recreational data compared to the commercial data. Recreational data are estimated and are usually not finalized until 6 months after the end of the calendar year. Therefore, NOAA Fisheries would not know the underharvest amount until half-way through the following year. Given the low confidence in the data, this approach may not help to fully utilize ACLs. Additionally, if underharvest is a result of a regulatory restriction(s) that prevents full ACL utilization (e.g., as a result of early closures due to quota linkages) or if underharvest occurs consistently in one sector, redistribution of the underharvest to that same sector may not increase opportunities to utilize the ACL.

Management Option D3

Distribute any unused catch across all sectors based on the regulatory proportion of the sector allocation, provided the overall ACL does not exceed ABC.

Under Management Option D3, any unused catch would be carried over and distributed across both the commercial and recreational sectors based on the proportions of the sector ACL distribution specified in the regulations. The unused ACL would be carried forward regardless of which sector the underharvest occurred in, as long as the overall ACL does not exceed the ABC. As with Management Option D2, because the overall ACL must remain under the ABC, it is possible that only a portion of the underharvest will be carried over.

For example, the commercial sector ACL for one management group accounts for 60 percent of the overall ACL, and the recreational sector ACL accounts for 40 percent of the overall ACL. If, after the fishing season, the commercial sector ACL was fully utilized, but the recreational sector ACL was underharvested by 10 mt dw, NOAA Fisheries would distribute the underharvest across both sector ACLs based on the proportions of the sector ACL distribution specified in the regulations. Thus, the following fishing season the commercial sector ACL of this management group would be increased by 6 mt dw (60 percent of 10 mt dw), while recreational sector ACL would be increased by 4 mt dw (40 percent of 10 mt dw).

This option is not preferred because there is less confidence in the recreational data than the commercial data. Recreational data are estimated and are usually not finalized until 6 months after the end of the calendar year. Therefore, NOAA Fisheries would not know the underharvest amounts until half-way through the following year. There is more confidence in commercial data as they are census data (complete data from all commercial dealers), and are updated on a weekly basis. Given these disparities, this approach may not help to fully utilize ACLs. Additionally, if underharvest is a result of a regulatory restriction(s) that prevents full ACL utilization (e.g., as a result of early closures due to quota linkages) or if underharvest occurs consistently in one sector, redistribution of the underharvest to that same sector may not increase opportunities to utilize the ACL.

Management Option D4

Distribute any unused portion of ACLs to the "reserve" sector ACL.

Under this option, if Management Option C3, which includes establishing a "reserve" sector allocation, is also preferred, then any underharvests of the overall ACL would be applied to the

reserve allocation in the subsequent year. NOAA Fisheries could then use the available reserve sector ACL to cover any potential overharvests or to increase initial quotas, if needed.

For example, if the commercial sector ACL for one shark management group was underharvested by 25 mt dw, and the recreational sector ACL was underharvested by 20 mt dw, NOAA Fisheries would redistribute the total underharvest of 45 mt dw to the "reserve" sector ACL. In the following fishing season, NOAA Fisheries could transfer the reserve section ACL to any of the management group sectors during the season. As with option D3, the overall ACL would still need to remain below the ABC.

This option is not preferred because the preferred ACL management option does not include a reserve sector. In addition, there is uncertainty with the confidence of the recreational data estimates. It would be administratively difficult to move quota inseason from the "reserve" sector ACL.

Management Option D5

Allow limited carry-over of underharvest to be distributed equally to the different sector ACLs, provided the overall ACL does not exceed the ABC.

Under this option, a limited portion of the unused overall ACL would be carried over on an annual basis and equally distributed to the different sector ACLs. NOAA Fisheries would limit the percentage of carry-over due to uncertainty in reporting, landings, and the biological condition of shark stocks.

For example, the overall ACL (combined commercial and recreational ACLs) for one healthy stock status shark management group with a high certainty with the landings reported is underharvested by 20 percent. Under Management Option D5, NOAA Fisheries could limit that carry-over to 15 percent of the overall ACL and equally distributed to the different sector ACLs. The remaining 5 percent would be held back for any potential management uncertainty. Another example would be where the overall ACL (combined commercial and recreational ACLs) for one shark management group with a high uncertainty with the landings reported has an overfished stock status and is underharvested by 20 percent. This option would limit that carry-over to potentially 5 percent of the overall ACL and equally distributed to the different sector ACLs. The remaining 15 percent would be held back for any potential management uncertainty. As with the other management options, the overall ACL would still need to remain below the ABC.

This option is not preferred because there is less confidence in the recreational data than the commercial data. Recreational data are estimated and are usually not finalized until 6 months after the end of the calendar year. Therefore, NOAA Fisheries would not know the underharvest amount until half way through the following year. There is more confidence in commercial data as they are census data, and are updated on a weekly basis. Given these disparities, this approach may not help to fully utilize ACLs. Additionally, if underharvest is a result of a regulatory restriction(s) that prevents full ACL utilization (e.g., as a result of early closures due to quota linkages) or if underharvest occurs consistently in one sector, equal distribution of the limited carry-over underharvest may not increase opportunities to utilize the ACL.

Management Option D6—Preferred Management Option

Allow carry-over for underharvests of the commercial quotas (landings only) under certain conditions.

Under Management Option D6, the preferred option, only underharvests from the commercial sector would be eligible for carry-over. Any unused quota would be added to the next year's commercial quota for any management group as long as the overall ACL remains below the ABC. Management Option D6 would be different from current regulations since this option would not cap carry-over underharvest to 50 percent of the base commercial quota and would not restrict which shark stocks can receive carry-over. In addition, this management unit also restricts the available underharvests that can be carried over to ensure the ABC is not exceeded.

This management option would allow carry-over for healthy, overfished, and unknown (unassessed) stocks. Shark stocks that are both overfished and experiencing overfishing would not be eligible for any carry-over of underharvests of the commercial quotas. For overfished stocks, the ABC would be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan. For unknown (unassessed) stocks, NOAA Fisheries in the past established the commercial quota at the historical average landings for that shark management group. As long as the commercial quota is not exceeded, carry-over of the underharvest would be appropriate.

This management option considers current catch monitoring limitations in HMS fisheries. Specifically, commercial landings are the only portion of the catch that is consistently reported and closely monitored on a frequent basis (weekly) with a high level of certainty across the entire range of the fishery. Estimates of dead discards are typically only compiled and evaluated during a stock assessment and have significantly higher year-to-year variability and associated uncertainty. Allowing carry-over due to an underharvest of dead discards would also not incentivize bycatch avoidance. Recreational harvest estimates are usually not finalized until 6 months after the end of the calendar year and could have high levels of uncertainty. Applying carry-over based on highly variable and/or uncertain estimates of recreational harvest and dead discards could carry a high risk of overages in subsequent years.

While this approach may appear to disadvantage the recreational sector by not allowing carry-over of recreational underharvests, this is not the intent of this option. Instead, NOAA Fisheries intends to maintain the current approach to recreational management by allowing shark fishing opportunities year-round without interruption, and by limiting mortality by a combination of bag limits, size limits, and gear restrictions. If recreational ACL underharvests or overharvests occur, NOAA Fisheries would implement management measures (such as bag or size limit adjustments) to adjust the ACL accordingly, and, if warranted, would reconsider the overall allocation between the commercial and recreational sectors following the process outlined in Final Amendment 12.

This option is preferred because of the high confidence in commercial data, which are census data and updated on a weekly basis, and because it could provide improved opportunities to utilize available quota. In combination with preferred Management Option C5 (removal or quota linkages), NOAA Fisheries believes the commercial ACL could be fully optimized on an annual basis. NOAA Fisheries does not have as high a level of confidence in the recreational data to

support the carry-over of underharvests in this sector. Thus, NOAA Fisheries prefers to implement management measures to adjust the recreational ACL, as appropriate, throughout the year.

Topic E: Multi-Year Overfishing Status Determination Criteria

The NS1 guidelines state, "[I]n certain circumstances, a Council may utilize a multi-year approach to determine overfishing status based on a period of no more than 3 years. The Council should identify in its FMP or FMP amendment, circumstances when the multi-year approach is appropriate and will be used. Such circumstances may include situations where there is high uncertainty in the estimate of F in the most recent year, cases where stock abundance fluctuations are high and assessments are not timely enough to forecast such changes, or other circumstances where the most recent catch or F data does not reflect the overall status of the stock. The multi-year approach to determine overfishing status may not be used to specify future annual catch limits at levels that do not prevent overfishing" (50 CFR 600.310(e)(2)(ii)(A)(3)).

The length of time between shark stock assessments is often greater than five years. The NS1 guidelines provide flexibility in overfishing status determinations to allow for a multiyear approach in instances where managers believe the most recent year's data point may not reflect the overall status of the stock. Therefore, NOAA Fisheries is exploring management options to incorporate this additional flexibility.

NOAA Fisheries may utilize a multi-year approach to determine overfishing status based on the NS1 guidelines, and identify where the multi-year approach is appropriate. NOAA Fisheries shark stock assessments are not timely enough to reflect changes in stock status for stocks in successful rebuilding plans. Additionally, the shark stock assessment process is not timely enough to accurately reflect status based on catch. NOAA Fisheries knows that the most recent catch levels are the most variable. Therefore, NOAA Fisheries needs the management flexibility to accurately change the stock status based on the current catch levels while utilizing a multiple year approach to reduce the uncertainty from the most recent catch data.

Management Option E1

No Action. Do not allow for multi-year overfishing stock determination criteria; overfishing occurs when F > MFMT = F_{MSY}; Stock Status would not change without a stock assessment.

Under this management option, NOAA Fisheries would maintain the current overfishing status determination criteria for shark stocks, which is when F exceeds the maximum fishing mortality threshold (MFMT = F_{MSY}). Changes in stock status would not occur without a stock assessment, which means there would be no change in stock status for any period of time between stock assessments.

NOAA Fisheries does not prefer Management Option E1 because most shark species can often go 5 to 10 years between assessments and the status can change more quickly than what is captured by assessments conducted under these timeframes. Given the extended periods of time between stock assessments, it would be beneficial to have the ability to evaluate and, if needed, adjust the stock status based on the most recent values for the status determination criteria to

determine the new stock status as with Management Option E3. This would allow for more responsive management of shark stocks.

Management Option E2

Change stock status annually in response to fishing mortality estimates.

Under Management Option E2, in years when a stock assessment is completed, NOAA Fisheries would use the results of a completed stock assessment to determine the overfishing status, and outside of an assessment year, would make decisions on stock status based on comparing annual catch to the OFL. If annual catch exceeds the annual OFL, then NOAA Fisheries would determine that overfishing is occurring. Conversely, if the annual catch is below the annual OFL, then NOAA Fisheries would determine that overfishing is not occurring. This option would allow NOAA Fisheries to determine whether or not overfishing is occurring without the need for a stock assessment. This option would not be used to determine if a stock is overfished.

Many shark stocks are assessed infrequently, which means that overfishing determinations are made infrequently as well. For example, sandbar sharks were assessed 5 years apart in 2011 and 2016 (overfished and not subject to overfishing), and finetooth sharks were assessed in 2007 (not overfished with no overfishing occurring) and the next assessment is expected to start in 2024 (over 14 years to date). This management option would give NOAA Fisheries the ability to evaluate stock status annually to determine whether overfishing is occurring. Evaluating the overfishing stock status on an annual basis would allow for more timely management actions.

NOAA Fisheries does not prefer this management option given the high annual variability of recreational and commercial harvests and bycatch estimates. The most recent estimates of mortality typically have the highest levels of management uncertainty (e.g., late reports, incomplete surveys). Applying an annual approach to determine overfishing stock status may add greater uncertainty into the management process, and result in management decisions that are either not beneficial to the stock or the stakeholders involved. Using such data for annual overfishing determinations could result in high instability in the fishery that might be unwarranted given the lack of accuracy in the data. For these reasons, NOAA Fisheries does not prefer this management option.

Management Option E3—Preferred Management Option

Compare a three-year average of fishing mortality estimates to the OFL to determine overfishing status.

Under Management Option E3, the preferred management option, in years when an assessment is conducted, NOAA Fisheries would use the results of a completed stock assessment to determine the overfishing status. Outside of an assessment year, NOAA Fisheries would compare a three-year rolling average of catch to the average OFL to determine overfishing status. This management option is the same as option E2 except that it uses a three-year rolling average instead of an annual measurement. As with management option E2, this management option would not be used to determine if a stock is overfished.

Specifically, if the three-year rolling average of catch exceeds the average OFL, then NOAA Fisheries would determine that overfishing is occurring. Conversely, if the three-year rolling average of catch is below the average OFL, then NOAA Fisheries would determine that overfishing is not occurring. This option would allow for a continued rolling average of catch compared to the OFL to determine if changes in management have been effective in ensuring overfishing is not occurring. If management is not effective, this option would allow for actions to be taken to end overfishing without the need to wait for an assessment.

NOAA Fisheries recognizes that the length of time between shark stock assessments is often greater than five years. The provisions in the NS1 guidelines provide flexibility in determining the most appropriate method to use to determine overfishing status. NMFS believes that a multi-year approach to determine overfishing can, in appropriate cases, be used effectively to protect a stock while providing stability to the fishery. Due to the high variability in the dead discard and recreational estimate data used to determine the amount of catch, NOAA Fisheries would use a three-year catch average for overfishing determinations (in the years when an assessment is not conducted). The most recent year of catch estimates would have the highest levels of uncertainty due to the potential of late reports, incomplete surveys, and unverified data. Many shark species are rarely observed in the commercial and recreational surveys, which could result in large confidence intervals in catch estimates. Some of the catch data are not finalized until after the start of the following fishing year and annual estimates of catch and interactions are variable year to year. Using annual catch estimates for overfishing determinations could result in stocks going on and off the overfishing list, and result in large annual adjustments in the fishery that may well be unwarranted given the lack of precision in the data.

NOAA Fisheries prefers this management option since it would allow for a more appropriate way for determining overfishing stock status, and would provide a more accurate status of the current stock status when compared to Management Option E2. In addition, this option would allow for more responsive management of shark stocks. The use of a three-year rolling average of catch (in the years when an assessment is not conducted) would also help to minimize the impact of highly variable annual estimates of recreational harvest and commercial bycatch on overfishing determinations, and thus provide more stability to the fishery.

3 Affected Environment

Brief Summary of Atlantic HMS Management

In 1993, NOAA Fisheries finalized the first FMP for Sharks of the Atlantic Ocean (58 FR 21931; April 26, 1993) (1993 FMP). The 1993 FMP established many of the management measures for Atlantic sharks that are the basis for those in place today, including permitting and reporting requirements, species complexes, commercial quotas, and recreational bag limits. NOAA Fisheries has continued to implement various management measures for Atlantic shark fisheries, including revised quotas, management groups, and a mechanism for establishing ACLs. Some of these measures are discussed in Chapter 1 of this document or in the 2019 Atlantic HMS SAFE Report (NOAA Fisheries 2020). Information on the complete HMS management history as it relates to sharks can be found in the 2006 Consolidated HMS FMP (NOAA Fisheries 2006) and Amendments 2, 3, 5a, 5b, 6, 9, and 11 to the 2006 Consolidated HMS FMP. Short descriptions of the relevant FMPS are outlined in Chapter 1 of this document.

Summary of Shark Management and Stock Status

The domestic stock status determination criteria and thresholds used to determine the stock status of Atlantic HMS are presented in Chapter 2 of the 2019 HMS SAFE Report (NOAA Fisheries 2020). Atlantic shark stock assessments for large coastal sharks and small coastal sharks are generally completed by the SEDAR process. All SEDAR reports are available at http://sedarweb.org/. ICCAT's SCRS has assessed blue, shortfin mako, and porbeagle sharks. All SCRS final stock assessment reports can be found at https://www.iccat.int/en/assess.html. In some cases, NOAA Fisheries also looks at available resources, including peer reviewed literature, for external assessments that, if deemed appropriate, could be used for domestic management purposes. NOAA Fisheries followed this process in determining the stock status of scalloped hammerhead sharks based on an assessment for the sharks completed by Hayes et al. (2009). Information on the stock status for Atlantic Shark species can be found in Chapter 2 of the 2021 HMS SAFE Report.

Shark Biology and Habitat

Sharks belong to the class Chondrichthyes (cartilaginous fishes), which also includes rays, skates, and deep water chimaeras (ratfishes). From an evolutionary perspective, sharks are an old group of fishes characterized by skeletons lacking true bones. The earliest known sharks were identified from fossils from the Devonian period, over 400 million years ago. These primitive sharks were small creatures, about 60 to 100 cm long, that were preyed upon by larger armored fishes that dominated the seas.

Shark species have highly variable life history characteristics and reproductive potential. These differences may have major effects on the management of these species and the levels at which sustainable yield can be achieved. NOAA Fisheries has considered this information in establishing reference points and management groups in previous amendments and rulemakings. Detailed information regarding the biology and reproductive potential of shark species managed

by NOAA Fisheries is available in the 2006 Consolidated HMS FMP (71 FR 58057; November 1, 2006).

Seventy-three species of sharks are known to inhabit the waters along the U.S. Atlantic coast, including the Gulf of Mexico and the waters around Puerto Rico and the U.S. Virgin Islands. Forty-two species are managed by the NOAA Fisheries HMS Management Division based upon their need for conservation and management. NOAA Fisheries divided HMS sharks into five species groups or complexes, based on ecology and fishery dynamics, for purposes of HMS management. These species groups or complexes are outlined in Table 4.

Table 4. Common Names of Shark Species Included within the Five Species Complexes

Species Complex	Shark Species Included
Large coastal sharks (11)	Sandbar[2, 5], silky[1, 4], tiger, blacktip[5], bull[5], spinner[5], lemon[5], nurse, smooth hammerhead[1, 4], scalloped hammerhead[1, 3, 4], and great hammerhead[1, 4] sharks
Small coastal sharks (4)	Atlantic sharpnose[5], blacknose[5], finetooth, and bonnethead[5] sharks
Pelagic sharks (5)	Shortfin mako[4], thresher, oceanic whitetip[1, 4], porbeagle[4, 6], and blue[5] sharks
Prohibited species (19)	Whale[4], basking[4], sand tiger, bigeye sand tiger, white[4], dusky[5], night[5], bignose[5], Galapagos[5], Caribbean reef [4], narrowtooth, longfin mako[4], bigeye thresher, sevengill, sixgill, bigeye sixgill, Caribbean sharpnose[5], smalltail[5], and Atlantic angel sharks
Smoothhound sharks (3)	Smooth dogfish, Florida smoothhound, and Gulf smoothhound

[1] Prohibited from commercial retention on pelagic longline gear and recreationally if swordfish, tunas, and/or billfish are also retained.
[2] Prohibited from retention with the exception of vessels selected to participate in the shark research fishery.
[3] Distinct population segment (DPS) in the central and southwest Atlantic Ocean listed as threatened under the Endangered Species Act.
[4] Listed under the Convention on International Trade in Endangered Species (CITES) Appendix II.
[5] Listed under CITES Appendix II with a 12-month implementation delay (November 2023).
[6] Must be released when caught alive on pelagic longline gear and recreationally if swordfish, tunas, and/or billfish are also retained.

Shark Fisheries Data

NOAA Fisheries monitors commercial landings of Atlantic sharks through electronically submitted dealer reports. Summary information of shark landings 2016 through 2020 are provided below and discussed in detail in the 2021 SAFE Report (Tables 5.9 – 5.15) (NOAA Fisheries 2022).

Over this period, the highest commercial landings of LCS in the Atlantic region were from 2016 with a total landings of 183 mt dw, primarily due to high landings blacktip, bull and tiger sharks. The lowest commercial landings for the time period occurred in 2019 with a total landings of 93 mt dw. Landings are variable over the time period and between the different LCS management groups with average annual landings of 131.8 mt dw.

In the Gulf of Mexico region, the highest commercial landings of LCS sharks occurred in 2018 with a total landings of 600 mt dw, primarily due to high landings of blacktip sharks. The lowest

commercial landings for this time period occurred in 2016 with a total commercial LCS landings of 346 mt dw. Average annual commercial LCS landings over this period were 400.8 mt dw.

In the Atlantic region, over this period, the highest commercial landings of SCS were from 2019 with a total of 148 mt dw landed, primarily of Atlantic sharpnose sharks. The lowest commercial landings over this period occurred in 2016 (95 mt dw for all SCS combined) when the blacknose shark fishery closed earlier in the season. The average annual commercial landings of SCS from 2016 through 2020 were 123.8 mt dw.

In the Gulf of Mexico, commercial landings of SCS over this period had the highest landings in 2016 with 74 mt dw landed, primarily of Atlantic sharpnose sharks. The lowest landings occurred in 2020 with 64 mt dw landed for all SCS combined. The average annual commercial landings from 2016 through 2020 of SCS were 67.2 mt dw.

Commercial landings of smoothhound sharks in the Atlantic and Gulf of Mexico combined between 2016 and 2020 averaged 351 mt dw with the highest landings occurring in 2018 with 412 mt dw landed. The lowest landings occurred in 2020 with 282 mt dw landed.

Pelagic sharks are harvested commercially both in the Gulf of Mexico and Atlantic regions. The highest commercial landings from 2016 to 2020 were in 2017 with 114 mt dw landed, primarily from shortfin mako. The lowest commercial landings occurred in 2020 with 45 mt dw landed, primarily due to a reduction in shortfin mako landings. Average commercial landings were 74 mt dw from 2016 through 2020.

Economic and Social Environment

In 2020, 8.4 billion pounds valued at $4.8 billion were landed for all fish species by U.S. fishermen at U.S. ports. That represents a 10.5 percent decrease over the 9.4 billion pounds valued at $5.6 billion that were landed for all fish species by U.S. fishermen at U.S. ports in 2019, with the decrease in landings largely being due to the effects of the COVID-19 pandemic on commercial fishing operations. The total value of commercial HMS landings in 2020 was $30.9 million (2021 SAFE Report). Revenues of HMS fisheries are further discussed in the 2021 Atlantic HMS SAFE Report (NOAA Fisheries 2022). This report includes information related to the revenue breakdown by gear type and gives specific information on the ex-vessel prices for the landed Atlantic HMS.

4 Fishery Impact Statement

For FMPs and plan amendments, the Magnuson-Stevens Act requires an FIS, which provides analyses of the benefits and costs of this action to the nation and the fishery as a whole. The information contained in this document, taken together with the data and analysis incorporated by reference, comprise the complete FIS.

Specifically, Section 303(a)(9) of the Magnuson Stevens Act requires NOAA Fisheries to include a FIS for plans or amendments (in the case of a plan or amendment there to submitted to or prepared by the Secretary after October 1, 1990), which shall assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for:

- Participants in the fisheries and fishing communities affected by the plan or amendment.
- Participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants.
- The safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery.

This chapter describes the fishery impacts as required by the Magnuson-Stevens Act.

Description of Management Objectives

The objectives of this amendment are to incorporate additional flexibility into an updated framework for Atlantic fisheries, with modifications to the ABC control rule and ACL provisions, and with options regarding status determination criteria, carryover, and phase-in of changes in acceptable catch levels, consistent with NS1 and the NS1 Guidelines. The revisions address a range of issues, including providing guidance on phasing in changes to catch limits and carrying over unused quota from one year to the next (81 FR 71858; October 18, 2016).

Economic Analysis of Expected Effects of the Final Action Relative to the Baseline

The social and economic impacts from all the management options considered in this action, relative to the status quo, are expected to be neutral as none of them would require regulatory changes to the shark fisheries, or significantly change administrative costs to the Agency. Final Amendment 14 provides changes to the shark management framework, established in Amendment 3, to adopt some of the provisions in the NS1 guidelines. These provisions allow for more flexibility in management measures to meet certain NS1 obligations while accounting for uncertainty and improving stability within the fishery. Final Amendment 14 does not apply the revised framework to any of the shark stocks or stock complexes. Application of the revised framework to specific shark fisheries would take place in subsequent rulemakings, with appropriate environmental impacts analysis and an opportunity for public comment.

There are potential benefits associated with this action relative to the no-action management option. The management options being considered would establish greater transparency and flexibility in the management of Atlantic shark fisheries that could provide greater stability to the commercial and recreational shark fisheries in the long term.

Conclusion

This action would not have an impact, direct or indirect, on the fishery, participants, safety at sea, or other fisheries. This action is not implementing regulations, modifying regulations or directly changing management. Any future actions implemented applying the management approaches implemented through Amendment 14 would be analyzed at the time they are proposed.

5 Applicable Law

Magnuson-Stevens Fishery Conservation and Management Act

Any FMP and any implementing regulations must be consistent with the 10 National Standards contained in the Magnuson-Stevens Act (Sec. 301). This section describes how the preferred management options for Final Amendment 14 are consistent with the national standards.

Consistency with National Standards

National Standard 1

NS1 requires that conservation and management measures prevent overfishing while achieving, on a continuing basis, optimum yield from each fishery. Final Amendment 14 provides changes to the shark management framework established in Amendment 3 to adopt some of the provisions in the NS1 guidelines. These provisions allow for more flexibility in management measures, while accounting for uncertainty and improving stability within the fishery. Final Amendment 14 does not apply the revised framework to any of the shark stocks or stock complexes. Application of the revised framework to specific shark fisheries would take place in subsequent FMP amendments and/or rulemakings, with appropriate environmental impacts analyses and opportunities for public comment.

NOAA Fisheries has undertaken numerous management actions, including the 2006 Consolidated HMS FMP (NOAA Fisheries 2006), Amendment 2 (NOAA Fisheries 2008), Amendment 3 (NOAA Fisheries 2010), Amendment 5a (NOAA Fisheries 2013), Amendment 6 (NOAA Fisheries 2015), and Amendment 5b (NOAA Fisheries 2017b), to address overfishing and to rebuild shark stocks. The preferred management options in this document build upon ongoing management efforts to rebuild, manage, and conserve target species in accordance with NS1, the NS1 guidelines, and other Magnuson-Stevens Act requirements.

National Standard 2

Consistent with NS2, NOAA Fisheries developed the preferred management options to fully utilize the best scientific information available. Under the preferred management options, NOAA Fisheries would improve flexibility in overfishing status determinations to allow for a multiyear approach in instances where the length of time between assessments does not provide more timely feedback to evaluate overfishing status based on current fishing levels. Amendment 14 would establish a framework for use in future actions and NOAA Fisheries would use the best scientific information available in developing those future actions.

National Standard 3

NS3 requires that, to the extent practicable, an individual stock of fish be managed as a unit throughout its range and interrelated stocks of fish be managed as a unit or in close coordination. Consistent with the approach set forth in the 2006 Consolidated HMS FMP (and its amendments), Final Amendment 14 applies to managed Atlantic shark stocks throughout their

range within the U.S. Exclusive Economic Zone (EEZ) and in state waters as a condition of federal HMS fishing permits, unless the state has more restrictive measures.

National Standard 4

NS4 requires that conservation and management measures do not discriminate between residents of different states. Furthermore, if it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation should be fair and equitable to all fishermen; be reasonably calculated to promote conservation; and should be carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges. The preferred management options in this document are consistent with NS4, as they apply across the entire Atlantic, Gulf of Mexico, and Caribbean U.S. EEZ. The preferred management options do not allocate or assign fishing privileges, or modify current allocations of fishing privileges. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address consistency of existing allocations and other conservation and management measures with NS4.

National Standard 5

NS5 requires that conservation and management measures should, where practicable, consider efficiency in the utilization of fishery resources with the exception that no such measure shall have economic allocation as its sole purpose. The preferred management measures improve the utilization of the fishery resources by ensuring there is greater flexibility to achieve optimum yield. None of the preferred management measures has economic allocation as its sole purpose. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address consistency of existing conservation and management measures with NS5.

National Standard 6

NS6 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches. Consistent with NS6, the preferred management measures provide the flexibility to consider the differences in fisheries (commercial and recreational), fishery resources, and variability of catches over time. The framework in Final Amendment 14 allows future ABCs, ACLs, phase-in ABC provisions, carry-over provisions, and multi-year overfishing designations to account for and address these differences as appropriate. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address consistency of existing conservation and management measures with NS6.

National Standard 7

NS7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication. The focus of Final Amendment 14 is to establish changes to the shark management framework based upon the NS1 guidelines. Thus, there are no costs or duplication to address here. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address minimizing costs and avoiding duplication in the fishery's existing conservation and management measures.

National Standard 8

NS8 states that conservation and management measures shall, consistent with the conservation requirements of the Magnuson-Stevens Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to provide for the sustained participation of such communities, and to the extent practicable, minimize adverse economic impacts on such communities. Final Amendment 14 provides flexibility in addressing NS1 requirements, consistent with the NS1 guidelines. This action would not have economic impacts on communities, because it is establishing a framework for future regulatory actions. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address consistency of existing conservation and management measures with NS8.

National Standard 9

NS9 states that conservation and management measures shall, to the extent practicable, minimize bycatch, and to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. Final Amendment 14 provides changes to the shark management framework for use in subsequent FMP amendments and/or rulemakings. Thus, it would not have impacts on bycatch or bycatch mortality. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address consistency of existing conservation and management measures with NS9.

National Standard 10

NS10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea. Final Amendment 14 provides changes to the shark management framework for use in subsequent FMP amendments and/or rulemakings. Thus, it would not have impacts on safety at sea. The 2006 Consolidated HMS FMP (and its amendments) and implementing regulations address consistency of existing conservation and management measures with NS10.

Consideration of Section 304(g) Measures

Section 304(g) of the Magnuson-Stevens Act sets forth requirements specific to the preparation and implementation of an FMP or FMP amendment for HMS. See 16 U.S.C. 1854(g). The summary of the requirements of Section 304(g) and an explanation of how NOAA Fisheries is consistent with these requirements are below. Final Amendment 14 sets out the procedure NOAA Fisheries would follow for establishing ABCs and ACLs in future rulemakings. No quotas or other management measures would actually be changed or affected. The preferred management options are described in more detail in Chapter 2 of the document.

Table 5. Requirements to Implement Fishery Management Plan Amendments and Related Actions by NOAA Fisheries

Requirement	Actions Taken
Consult with and consider the views of affected Councils, Commissioners, and advisory groups.	On September 24, 2020, NOAA Fisheries published a Notice of Availability for Draft Amendment 14 (85 FR 60132). The comment period closed on December 31, 2020, and included three public webinars. NOAA Fisheries also presented information on Draft Amendment 14 at the HMS Advisory Panel along with the Gulf of Mexico and South Atlantic Fishery Management Council meetings. In response to the commenters' requests for more information on the ABC control rule, NOAA Fisheries published a supplement to Draft Amendment 14 on January 24, 2022 (87 FR 3504). The comment period closed on March 10, 2022 and details were presented at one public webinar and at the HMS Advisory Panel meeting in February 2022.
Establish an advisory panel for each FMP.	As part of the 2006 Consolidated HMS FMP, NOAA Fisheries combined the Atlantic Billfish and HMS Advisory Panels into one. The combined panel provides representation from the commercial and recreational fishing industry, academia, non-governmental organizations, state representatives, representatives from the Regional Fishery Management Councils, and the Atlantic and Gulf States Marine Fisheries Commissions. This amendment would not change the HMS Advisory Panel, and discussed the relevant subjects at the December 2020 and February 2022 meetings, including extensive discussion of the preferred management options, as outlined in the Amendment 14 Scoping document.
Evaluate the likely effects, if any, of conservation and management measures on participants in the affected fisheries and minimize, to the extent practicable, any disadvantage to U.S. fishermen in relation to foreign competitors.	Throughout this document, NOAA Fisheries has described the effects of the management measures and no impacts expected on U.S. fishermen. The preferred management options in this document are necessary to evaluate and incorporate additional tools to better manage shark stocks through the use of phase-in and carry-over provisions, multiyear overfishing designations, and the modification of current ABC control rules, which in the long-term are not expected to disadvantage U.S. fishermen in relation to foreign competitors.
With respect to HMS for which the United States is authorized to harvest an allocation, quota, or fishing mortality level under a relevant international fishery agreement, provide fishing vessels with a reasonable opportunity to harvest such allocation, quota, or at such fishing mortality level.	No measures are being finalized as part of this action with regard to harvest of allocation, quota, or fishing mortality levels. Amendment 14 is developing a framework to implement management measures in subsequent rulemakings to be consistent with the NS1 guidelines, and considers changes to ABC control rule, phase-in ABC provisions, carry over provisions, and multiyear overfishing designations.
Review on a continuing basis, and revise as appropriate, the conservation and management measures included in the FMP.	NOAA Fisheries continues to review the need for any revisions to the existing regulations for Atlantic HMS fisheries. Amendment 14 to the 2006 Consolidated HMS FMP is the culmination of one of those reviews.

Diligently pursue, through international entities, comparable international fishery management measures with respect to HMS.	Amendment 14 is developing a framework to implement management measures in subsequent rulemakings to be consistent with the NS1 guidelines, and considers changes to ABC control rule, phase-in ABC provisions, carry over provisions, and multiyear overfishing designations. For internationally managed stocks that establish a TAC, the TAC would be adopted and implemented as appropriate.
Ensure that conservation and management measures under this subsection: 1. Promote international conservation of the affected fishery; 2. Take into consideration traditional fishing patterns of fishing vessels of the United States and the operating requirements of the fisheries; 3. Are fair and equitable in allocating fishing privileges among U.S. fishermen and do not have economic allocation as the sole purpose; and 4. Promote, to the extent practicable, implementation of scientific research programs that include the tagging and release of Atlantic HMS.	The goal of Amendment 14 is to modify the current framework for determining and implementing ABCs and ACLs for domestic shark species. Therefore, it is only relevant to domestic shark stocks. In addition, no management measures are finalized as part of this action, and these requirements are not applicable for this action.

Paperwork Reduction Act

There are no new collection of information requirements in the action pursuant to the Paperwork Reduction Act.

Coastal Zone Management Act

NOAA Fisheries has determined that this action would not affect the coastal zone of any state beyond that previously analyzed in the consistency determinations for Amendments 2, 5a, 6, and 9 sent to the states following publication of the applicable rules. Consequently, no additional consistency consultation is required.

NOAA Fisheries previously determined that the final rule to implement Amendment 2 to the 2006 Consolidated HMS FMP (73 FR 35778, June 24, 2008; corrected on 73 FR 40658; July 15, 2008), the final rule to implement Amendment 5a to the 2006 Consolidated HMS FMP (78 FR 40318; July 3, 2013), the final rule to implement Amendment 6 to the 2006 Consolidated HMS FMP (80 FR 50073; August 18, 2015), and the final rule to implement Amendment 9 to the 2006 Consolidated HMS FMP (80 FR 73128; November 24, 2015) are consistent to the maximum extent practicable with the enforceable policies of the approved coastal management program of coastal states on the Atlantic including the Gulf of Mexico and the Caribbean Sea. Pursuant to 15 CFR 930.41(a), NOAA Fisheries provided the Coastal Zone Management Program of each coastal state a 60-day period to review the consistency determination and to advise the Agency

of their concurrence. NOAA Fisheries received concurrence with the consistency determinations from several states and inferred consistency from those states that did not respond within the 60-day time period.

Environmental Justice

Executive Order 12898 requires agencies to identify and address disproportionately high and adverse environmental effects of its regulations on minority and low-income populations. To determine whether environmental justice concerns exist, the demographics of the affected area should be examined to ascertain whether minority populations and low-income populations are present. If so, a determination must be made as to whether implementation of the management options may cause disproportionately high and adverse human health or environmental effects on these populations.

Community profile information is available in the 2006 Consolidated HMS FMP (Chapter 9), a report by MRAG Americas, and Jepson (2008) titled "Updated Profiles for HMS Dependent Fishing Communities" (Appendix E of Amendment 2 to the 2006 Consolidated HMS FMP), and in the 2015 HMS SAFE Report. The MRAG report updated community profiles presented in the 2006 Consolidated HMS FMP, and provided new social impacts assessments for HMS fishing communities along the Atlantic and Gulf of Mexico coasts. The 2011 and 2012 SAFE Reports (NOAA Fisheries 2011 and NOAA Fisheries 2012) include updated census data for all coastal Atlantic states, and some selected communities that are known centers of HMS fishing, processing, or dealer activity. Demographic data indicate that coastal counties with fishing communities are variable in terms of social indicators like income, employment, and race and ethnic composition.

The preferred management options have no ecological and economic impacts and provide for the sustained participation of fishing communities. The preferred management options would not have any effects on human health nor are they expected to have any disproportionate social or economic effects on minority and low-income communities. Since the Final Amendment 14 framework would not implement measures with effects, it would not individually or cumulatively have a significant effect on the human environment and is appropriately categorically excluded from further NEPA analysis. Thus, neither an environmental assessment nor an EIS is required.

6 List of Preparers

The development of this rulemaking involved input from many people within NOAA Fisheries, NOAA Fisheries contractors, and input from the public, constituent groups, and the HMS Advisory Panel. Staff and contractors from the HMS Management Division, in alphabetical order, who worked on this document include:

- Randy Blankinship, Division Chief
- Karyl Brewster-Geisz, Branch Chief
- Peter Cooper, Branch Chief
- Guy DuBeck, Fishery Management Specialist
- Brad McHale, Branch Chief
- Ian Miller, Fishery Management Specialist
- Sarah McLaughlin, Management and Program Analyst
- Ann Williamson, Fishery Management Specialist

The development of this document also involved considerable input from other staff members and Offices throughout NOAA including, but not limited to:

- Other Divisions within the Office of Sustainable Fisheries
    - Debra Lambert
- NOAA Fisheries Southeast Fisheries Science Center
    - Craig Brown, Branch Chief
    - Dean Courtney, Research Fish Biologist
    - Enric Cortes, Senior Scientist
    - Joel Rice, Contractor
    - Xinsheng Zhang, Research Mathematical Statistician
- NOAA Office of General Counsel
    - Megan Walline, Attorney-Advisor, Fisheries and Protected Resources Section
    - Sean Roberts, Attorney-Advisor, Fisheries and Protected Resources Section
- NOAA Fisheries NEPA
    - Cristi Reid, NEPA Coordinator, Office of Policy

List of Agencies, Organizations, and Persons Consulted

Under 304(g)(1)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to consult and consider the comments and views of affected Fishery Management Councils, ICCAT Commissioners and advisory groups, and advisory panels established under 302(g) regarding amendments to an Atlantic HMS FMP. NOAA Fisheries provided documents for the Atlantic, Gulf, and Caribbean Fishery Management Councils, Gulf and Atlantic States Marine Fisheries Commissions, and the HMS Advisory Panel at various stages throughout the process.

Specifically, the HMS Advisory Panel was consulted during the scoping, draft amendment, supplemental ABC control rule tiers phases. Hard copies will be provided to anyone who requests copies. All comments received during the draft amendment phase and the supplemental document phase are summarized and addressed in Appendix 1.

References

CFMC. 2020. Final Island Based Fishery Management Plans. CFMC, San Juan, Puerto Rico. Public Document.

Courtney, D., and J. Rice. In preparation. Meta-analysis of historical stock assessment uncertainty for U.S. Atlantic HMS domestic sharks: An example application within a tiered acceptable biological catch (ABC) control rule. NOAA Technical Memorandum NMFS-SEFSC.

GMFMC. 2011. Final Generic Annual Catch Limits/Accountability Measures Amendment for the Gulf of Mexico Fishery Management Council's Red Drum, Reef Fish, Shrimp, Coral and Coral Reefs, Fishery Management Plans. Gulf of Mexico Fishery Management Council, 2203 North Lois Avenue, Suite 1100, Tampa, Florida 33607.

Hayes CG, Jiao Y, Cortés E. 2009. Stock assessment of scalloped hammerheads in the Western North Atlantic Ocean and Gulf of Mexico. North American Journal of Fisheries Management 29:1406-1417.

MRAG, Americas, Inc., and M. Jepson. 2008. Updated Profiles for HMS Dependent Fishing Communities: Social Impact Assessment Services for HMS Fishing Communities. Solicitation Number: DG133F06RQ0381, 84 pp.

NOAA Fisheries. 1999. Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2003. Final Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2006. Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD. Public Document.

NOAA Fisheries. 2008. Final Amendment 2 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2010. Final Amendment 3 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2011. Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species, 2011. Silver Spring MD: U.S. Department of Commerce, National Marine Fisheries Service. 294 pp.

NOAA Fisheries. 2012. Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species, 2011. Silver Spring MD: U.S. Department of Commerce, National Marine Fisheries Service. 203 pp.

NOAA Fisheries. 2013. Final Amendment 5a to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2015. Final Amendment 6 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2016. Final Amendment 9 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2017a. Final Amendment 10 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD. Public Document.

NOAA Fisheries. 2017b. Final Amendment 5b to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NOAA Fisheries. 2022. Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species, 2021. Silver Spring MD: U.S. Department of Commerce, National Marine Fisheries Service. 273 pp.

PFMC. 2020. Pacific Coast Groundfish Fishery Management Plan. Pacific Fishery Management Council. 7700 NE Ambassador Place, Suite 101, Portland, OR 97220.

Ralston, S., Punt, A. E., Hamel, O. S., DeVore, J. D. and Conser, R. J. 2011. A meta-analytic approach to quantifying scientific uncertainty in stock assessments. Fishery Bulletin 109:217–231.

Appendix 1. Comments Received During Draft Amendment and Supplement to Draft Amendment

This section provides a summary of the comments received during the draft amendment and the supplement to draft amendment phases. The written comments received can all be found at *www.regulations.gov* (NOAA-NMFS-2019-0040).

Overall Comments on this Amendment

Comment: NOAA Fisheries received a comment in support of and a comment in opposition to Amendment 14. Florida Fish and Wildlife Conservation Commission (FWC) said they supported the actions and preferred management options in Draft Amendment 14 because the measures could provide for more active, responsive management and increase management flexibility. A commenter opposed Amendment 14, saying there was a lack of details provided in the document regarding the effect of changes in terms of a new ABC control rule or harvest control rules used to set ACLs. The commenter asserted that NEPA requires NOAA Fisheries to fully consider and disclose the environmental consequences of an agency action before proceeding with that action.

Response: NOAA Fisheries agrees with the Florida FWC that Amendment 14 would increase management flexibility and create more responsive management measures. In response to the second comment, since Amendment 14 sets forth a framework general approaches to how NOAA Fisheries may establish management changes are presented, without some of the specific details. The application of the revised framework to specific shark stocks and management complexes would take place in subsequent FMP amendments or regulatory action, with appropriate environmental impacts and other analyses and an opportunity for public comment.

Comment: One commenter supported overall management improvements and new management measures on data collection, including regarding fishery-independent data collection and observer and reporting requirements. The commenter stated that these data are important to calculate estimates of each shark population as well as estimates of fishing mortality, directed catch, and bycatch for each shark species.

Response: As described in the Atlantic HMS Best Scientific Information Available (BSIA) Regional Framework, NOAA Fisheries continues to use the best scientific information available to manage the shark stocks. NOAA Fisheries has an internal review process, consisting of staff from Regional Science Centers and/or Office of Science and Technology, which provides guidance and support on data collection along with calculating estimates to actively manage the shark fisheries and also a separate review of scientific recommendations to ensure they would be consistent with stock status. In addition, NOAA Fisheries will continue to use SEDAR stock assessments, which are peer reviewed, for domestically assessed sharks. All of the SEDAR

meetings are open to the public and the data provided in the assessment is located on the SEDAR website (http://sedarweb.org/). The internal stock assessment review process ensures that assessments and data used in the assessments are based on best scientific information available, scientifically valid and reflective of the current state of each stock or stock complex, and appropriately take into account the risk policy on preventing overfishing and/or rebuilding the stock. For internationally assessed stock assessments, NOAA Fisheries relies on the ICCAT stock assessment process. If NOAA Fisheries determines an externally conducted stock assessment that has been published in a scientific journal constitutes the best scientific information available, that stock assessment would be reviewed to ensure it is also appropriate for management to use before any results from that assessment are used in the development of management measures.

Comment: One commenter stated that NOAA Fisheries should examine ways to better account for the age structure of shark populations in management measures, which can affect factors like size and fecundity.

Response: Under the ABC control rule tiers described in the Supplement to Draft Amendment 14 and finalized in this document, shark stocks that would be considered Tier 1 stocks would include an accepted data-rich age-structure stock assessment approach. For Tiers 2 and 3, the accepted assessment may include age-structure as one of the time series in the assessment. For Tier 4 shark stocks, NOAA Fisheries may consider the age-structure of the shark stock when determining the scalar multiplier for the OFL proxy. NOAA Fisheries would provide more details on this information for specific shark stocks or stock complexes in subsequent FMP amendments or regulatory action.

Comments Regarding ABC Control Rule Options (Topic A)

Comment: During the first round of comments on the ABC Control Rule, NOAA Fisheries received comments that supported the preferred option (Management Option A3) for a tiered ABC control rule and comments that indicated concern for the lack of detail in the preferred option. Commenters supported the tiered ABC control rule approach because they felt it is the most sustainable plan for sharks. Some commenters were concerned about supporting the preferred option without any concrete information regarding what the "tiers" would be. There was concern that Amendment 14 sets the standards for future shark fishery management decisions without all the details. When NOAA Fisheries took comments on the Supplement to Amendment 14, most commenters supported the ABC control rule, but some commenters requested more details on the placement of shark stocks within the tier structure. Commenters wanted to know where each shark stock would be placed within the tier structure along with the OFL, ABC, ACLs, and the scientific uncertainty buffers for those stocks.

Response: Based on the first round of comments, NOAA Fisheries reworked the preferred Management Option A3 and provided further details on the tiered ABC control rule in the Supplement to Draft Amendment 14. In finalizing Amendment 14, NOAA Fisheries combined Draft Amendment 14 and the Supplement to Draft Amendment 14. Within the revised preferred Management Option A3, the tiers apply to all sharks that have a stock status of healthy (i.e., not subject to overfishing and not overfished), experiencing overfishing, or unknown. Shark

stocks that are: (1) under a rebuilding plan, (2) assessed (or could be assessed) by the scientific body of ICCAT, or (3) in the prohibited shark complex (Table 1 of Appendix A to 50 CFR part 635) would be outside of these tiers, as discussed in more detail in Final Amendment 14. However, NOAA Fisheries did not provide details on the placement of each shark stock with the ABC control rule nor the OFL, ABC, ACLs, and the scientific uncertainty buffers for those stocks.

Because of the high technical complexity in determining sigma_min, as well as the methodology to determine OFL and sigma from each individual assessment, NOAA Fisheries may phase in the ABC control rule changes for some shark stocks. Under this phased-in approach, any new stock assessment would provide the information necessary to fully calculate the scientific uncertainty needed to meet the requirements under this preferred alternative. Until a new stock assessment is completed or the methodology to obtain OFL and sigma has been developed for all previous stock assessment models, NOAA Fisheries generally would use the BSIA from the previous stock assessments to determine the appropriate OFL, ABC, and ACL for each shark stock. As needed, NOAA Fisheries will provide the details for the phased approach in the future rulemakings that implement the framework implemented in this document.

Amendment 14 establishes the ABC control rule framework, but does not apply it to particular stocks. Instead, NOAA Fisheries will, in future rulemakings, propose application and detailed analysis on the application of the ABC control rule for specific shark stocks and provide OFL, ABC, ACLs, and the scientific uncertainty buffers for those shark stocks. All of this would be provided in subsequent FMP amendments or regulatory actions, with appropriate environmental impacts analysis and an opportunity for public comment.

Comment: NOAA Fisheries received comments regarding the HMS risk policy. Commenters stated that NOAA Fisheries should require a likelihood of success of at least 70 percent in all circumstances since shark species are vulnerable to overfishing due to their slow reproduction rates. Some commenters expressed concern that a 50-percent likelihood of success for the HMS risk policy would create a small buffer between the OFL and ABC, and not properly account for scientific uncertainty. In addition, a commenter stated that the HMS risk policy of 70-percent probability of achieving shark recovery is too high in light of the shark depredation impacts to other species and fisheries.

Response: In Draft Amendment 14, NOAA Fisheries did not propose changing the HMS management risk policy. For most Atlantic shark stocks, NOAA Fisheries would establish a 70-percent likelihood of success in ending and preventing overfishing, rebuilding overfished stocks, and maintaining healthy stocks, because most sharks have low reproductive potential, are long-lived, and have slow population growth rates. However, a range between 50- and 70-percent likelihood of success within the existing risk policy has also been considered depending on the stock and relevant circumstances (e.g., data, fishery changes, extenuating circumstances, etc.). Overall, the HMS risk policy is intended to ensure that the ABC does not exceed the OFL and scientific uncertainty would properly be accounted for.

The rate of shark depredation events by a certain shark species was not considered when the risk policy was established. Based on anecdotal information from state-managed and federally-managed fisheries, NOAA Fisheries believes that reports of shark depredation have

been increasing in recent years due in part to potentially learned behavior, rebuilding of some shark populations, increasing fishing effort, and more fish being released and discarded due to more restrictive regulations. As with any recovering apex predator population, interactions between humans and sharks are expected to increase as their stocks and their prey rebuild, although other factors are likely involved in the increased occurrence of shark depredation. However, NOAA Fisheries does not have sufficient information (e.g., which species are involved, where and when depredation is occurring, etc.) to consider this issue in the context of the risk policy.

Comment: NOAA Fisheries received comments on how to develop the ABC control rule. One commenter suggested that NOAA Fisheries review Regional Fishery Management Councils' ABC control rules to help develop one for the shark fisheries. Another commenter suggested that NOAA Fisheries work with a SSC to develop tier levels and evaluate the data that goes into each tier.

Response: NOAA Fisheries reviewed the various Council ABC control rules and incorporated elements into the HMS ABC control rule. For example, the Supplement to Draft Amendment 14 proposed three as the upper bound for the scalar, as this was adopted in the Caribbean Fishery Management Council's Island-based FMP (CFMC 2020). Final Amendment 14 finalizes that approach for Atlantic sharks.

NOAA Fisheries does not have an SSC for Secretarially-managed Atlantic HMS, but SEDAR stock assessments are peer reviewed and NOAA Fisheries uses an internal review process, consisting of staff from Regional Science Centers and/or Office of Science and Technology, which provides a separate review of ABC control rule recommendations to ensure they would be consistent with BSIA. While SEDAR stock assessments are peer reviewed, and NOAA Fisheries ensures the current process for establishing ACLs is based on the best scientific information available, NOAA Fisheries does not have an SSC for Secretarially-managed Atlantic HMS to review stock assessments, develop, and apply ABC control rules, and to make ABC recommendations for the stocks that they manage. The internal stock assessment review process ensures that the assessment and stock status determination are scientifically valid and reflective of the current state of each stock and appropriately take into account the risk policy to rebuild the stock.

Comment: NOAA Fisheries received comments regarding the data in the ABC control rule along with factors to consider for the uncertainty buffers. Some commenters expressed concern that the OFL, ABC, and ACL could be based on uncertain data sources estimates (e.g., MRIP) and multiple layers of precautionary uncertainty buffers from the data could reduce the ACLs far from the optimum yield for the fishery. Other commenters requested that NOAA Fisheries consider climate change, the human factor (fishing experience, jobs), and the impacts to other species and fisheries when establishing the uncertainty buffers in the ABC control rule.

Response: NOAA Fisheries uses the best scientific information available to monitor and manage the federal shark fisheries. In the recreational data, NOAA Fisheries is addressing uncertainty by redesigning LPS to provide more statistically valid and robust data. For MRIP, NOAA Fisheries has fully transitioned to the Fishing Effort Survey with new data standards

coming in 2023. While there is always uncertainty in stock assessment data inputs, model outputs, and the subsequent interpretation of results, NOAA Fisheries would use the best scientific information available to establish proper buffers, consistent with National Standard 1's requirement to prevent overfishing while achieving, on a continuing basis, optimum yield. *See* 50 C.F.R. 600.310(e)(3)(i)(B) (explaining that "achieving, on a continuing basis, the OY from each fishery" means: producing, from each stock, stock complex, or fishery, an amount of catch that is, on average, equal to the specified OY; prevents overfishing; maintains the long term average biomass near or above B_{msy}; and rebuilds overfished stocks and stock complexes).

In establishing the uncertainty buffers, based on best scientific information available, NOAA Fisheries plans to evaluate climate change and consider economic, social and ecological trade-offs between being more or less risk averse. *See* 50 C.F.R. 600.310(f)(2)(i)(B). NOAA Fisheries notes the importance of analyzing effects of measures on fishermen and fishing communities. *See, e.g.*, MSA sec. 303(a)(9) (requirement to include a fishery impact statement in FMP). In subsequent rulemakings to implement the ABC control rule framework from Amendment 14, NOAA Fisheries would aim to optimize the ability for the commercial shark fishery to harvest available, science-based shark quotas, to the extent practicable, while also considering fairness among sectors.

Comment: NOAA Fisheries received comments regarding the stock assessment data used in the ABC control rule analysis. Some commenters are concerned about using historical pooled scientific uncertainty given stock assessment data and methods have changed so much and historical stock assessments have been known to have higher uncertainty when compared to present stock assessments. Other commenters expressed concern that old stock assessment data for some shark species will determine future management measures. Another commenter stated that all shark species without stock assessments conducted in the past 10 years should be placed in Tier 4 since the data is outdated to properly manage the shark stock, while another commenter stated that landing restrictions should not apply to commercial or recreational fisheries for shark species managed without an assessment conducted in the past 10 years. In addition, a commenter requested that NOAA Fisheries examine options for regularly evaluating shark population levels, particularly when stock assessments are not available, and regularly updating stock status determinations.

Response: Based on the Ralston et al. (2011) approach, a minimum estimate of stock assessment scientific uncertainty was obtained from meta-analysis of assessment variability in historical HMS domestic shark stocks assessed multiple times within the SEDAR process during the last 20 years. While the approach used to assess stocks has changed over time, this approach can still provide estimates of levels of scientific uncertainty by analyzing the historical variability in Atlantic shark stock assessments' estimates of population size. The pooled uncertainty estimate is assumed to represent a minimum estimate of scientific uncertainty for application in the ABC control rule. This approach is similar to the approaches taken by the Caribbean, Gulf of Mexico, and Pacific Fishery Management Councils (CFMC 2020; GMFMC 2011; PFMC 2020) and in a NOAA Technical Memorandum currently being developed (Courtney and Rice 2022). Additionally, for each assessment, there is a level of scientific uncertainty. Before deciding on the final level of scientific uncertainty to use for calculating the ABC, the minimum estimate from the pooled uncertainty will be compared to the estimate from

the individual stock assessment. NOAA Fisheries will choose the larger of the two values to be more precautionary around the scientific uncertainty.

The Ralston et al. (2011) methodology for determining sigma_min, as well as the methodology to determine OFL and sigma from each individual assessment, is highly technical. While NOAA Fisheries has worked through the process for stock assessments conducted using an integrated age-structured model (Stock Synthesis) (these assessments are anticipated to fall under Tier 1), the process for calculating OFL and sigma has not been completed for each previous individual data-moderate or data-limited assessment model (anticipated to fall under Tier 2 or Tier 3). As such, NOAA Fisheries is concerned that fully calculating the appropriate OFL and sigma to use for each stock that has already been assessed (using models other than Stock Synthesis) may cause inordinate delays in implementing the ABC control rule and could also have implications on the timing of ongoing and future stock assessments. In order to reduce such delays, NOAA Fisheries may phase in the changes from the ABC control rule for some shark stocks. Under this phased-in approach, any new stock assessment, including update assessments of previously assessed stocks, would provide the information necessary to fully calculate the scientific uncertainty needed to meet the requirements under this preferred alternative. For example, this process could start with the ongoing SEDAR 77 (Hammerhead Sharks Research Track Assessment) with the application of the ABC control rule for scalloped hammerhead, great hammerhead, and smooth hammerhead sharks and be peer-reviewed through the SEDAR process and CIE reviewers. Until a new stock assessment is completed or the methodology to obtain OFL and sigma has been developed for all previous stock assessment models, NOAA Fisheries generally would use the BSIA from the previous stock assessments to determine the appropriate OFL, ABC, and ACL for each shark stock. As needed, NOAA Fisheries will provide the details for the phased approach in the future rulemakings that implement the framework in this document.

Regarding the comment on landing restrictions, NOAA Fisheries needs to implement appropriate measures for managed shark species in commercial and recreational fisheries, consistent with the Magnuson-Stevens Act, regardless of whether (or not) an assessment was conducted for the shark species. In all cases, NOAA Fisheries implements management measures based on the best scientific information available. With respect to stock assessments, SEDAR is the cooperative process by which stock assessments are conducted in the NOAA Fisheries Southeast Region. The SEDAR approach is founded on science based decision-making, in which SEDAR panels must consider biological and technical aspects of datasets and stock assessments and base recommendations upon the scientific merit of the alternatives finalized. SEDAR brings together scientists, researchers, data collectors, managers, fishermen, and constituent representatives to participate in the development and review of stock assessments. Recently, SEDAR assessments have been classified as either research track or operational assessments. These new classifications apply to future assessments undertaken under this new scheme; older assessments will remain as previously classified. Research track assessments are similar to benchmark assessments, in that they are peer reviewed and have numerous opportunities for public input; and are used to develop the tools, data, and models used in the stock assessment process. Research track assessments are not used to provide management advice. Instead, they establish the foundations for operational assessments that do provide management advice. Operational assessments, which may include procedures similar to the previous standard-type and update-type assessments, use previously approved methods and data sources to provide

management advice quickly and efficiently. The major differences between research track and operational assessments are summarized in Table 2 of the BSIA framework for Atlantic HMS stock assessments and stock status determinations (https://www.fisheries.noaa.gov/resource/document/atlantic-highly-migratory-species-best-scientific-information-available-regional). The first HMS stocks that will be assessed using this approach will be the hammerhead shark complex in 2021-2023.

Regarding the updating of stock status determinations, outside of an assessment year, NOAA Fisheries prefers to compare a three-year rolling average of catch to the OFL to determine overfishing status for the reasons explained under Topic E: Management Option E3. This preferred management option would not be used to determine if a stock is overfished.

Comment: NOAA Fisheries received comments regarding Tier 3 shark stocks. Commenters expressed concern that the poor or limited shark data would create issues with establishing an appropriate ABC and ACL for these shark stocks, thus, leading to issues managing the shark stocks to those levels.

Response: NOAA Fisheries believes it can establish an appropriate ABC and ACL for data-limited shark stocks in Tier 3, since Tier 3 stocks would have an accepted stock assessment. Although the stocks have a data-limited stock assessment, a higher level of uncertainty (multiple of the sigma_min) would be used. In addition, NOAA Fisheries would establish AMs to ensure the shark stock is managed at appropriate levels and the ABC is not exceeded.

Comment: NOAA Fisheries received a comment that stocks with unknown status should be managed with an assumption that they are vulnerable and may be overfished in order to ensure compliance with National Standard 1.

Response: NOAA Fisheries manages all the shark stocks, including stocks with unknown status, consistent with the Magnuson-Stevens Act's National Standard 1 and rebuilding requirements. The comment did not provide a scientific basis for the proposed assumption, and based on its review of approaches used currently in other FMPs, BSIA, and public comments, NOAA Fisheries believes that its approach to stocks with unknown status is appropriate. Under Amendment 14, shark stocks that have an unknown status would fall under Tier 4 of the ABC control rule, since there is no accepted assessment available. NOAA Fisheries would set the OFL proxy equal to the mean of reference period catch multiplied by a scalar less than or equal to three. The specific scalar would be derived from the characteristics, such as life history characteristics (e.g., productivity), susceptibility to fishing pressure, or other appropriate considerations (e.g., results of an ecological risk assessment), of the fishery for each shark stock. ABC would then be set at less than or equal to 90 percent of the OFL proxy, based on scientific uncertainty associated with data for the particular shark stock or stock complex. The reference period and appropriate scalar for the OFL proxy and the ABC would be established in a subsequent rulemaking for a particular stock or stock complex. Through this process, NOAA Fisheries would establish management measures for these shark stocks, consistent with National Standard 1's requirement to prevent overfishing while achieving, on a continuing basis, optimum yield.

Comment: NOAA Fisheries received comments regarding Tier 4 shark stocks reference period of catch, setting the ABC, and placement of shark stocks. Commenters were concerned that the reference period of catch has been affected by management measures (e.g., quota linkages) and other factors (e.g., markets, state shark fin bans). Other commenters were concerned that the ABC should be set at more precautionary levels than to be set at up to or equal to 90 percent of the OFL proxy, as proposed. They stated that, due to the slow growing shark species and unknown stock statuses, NOAA Fisheries should create larger buffers for Tier 4 shark stocks.

Response: For Tier 4 shark stocks, an accepted stock assessment is not available, data quality and data availability have not been fully vetted through a stock assessment process that is subject to peer review, and the OFL is unknown. Therefore, NOAA Fisheries would set an OFL proxy equal to the mean of reference period catch multiplied by a scalar less than or equal to three. The specific scalar would be derived from life history characteristics (e.g., productivity), susceptibility to fishing pressure, or other appropriate considerations (e.g., results of an ecological risk assessment), of the fishery for each shark stock. Even though management measures, such as quota linkages, or other factors impacting the shark fisheries, such as markets or state shark fin bans, could impact the mean reference period of catch and the overall OFL, NOAA Fisheries would use a scalar multiplied by the mean reference period of catch to offset those impacts.

For setting the ABC, NOAA Fisheries plans to establish the ABC control rule to allow the ABC for a Tier 4 shark stock to be set at less than or equal to 90 percent of the OFL proxy, as appropriate. However, the ABC for a particular Tier 4 shark stock or stock complex would be set based on the scientific uncertainty associated with data for the particular shark stock or stock complex, and therefore, the ABC may be lower than 90 percent of the OFL proxy. The appropriate ABC for individual shark stocks or stock complexes will be established in subsequent rulemakings, with appropriate environmental impacts analysis and further opportunity for public comment.

Comment: NOAA Fisheries received comments regarding the potential impacts on shark stocks that have been or could be assessed by ICCAT. Some commenters were concerned that the language in the Supplement to Draft Amendment 14 is vague and needs to clearly explain NOAA Fisheries' current position on monitoring ICCAT shark species stocks along with clarifying the ACLs requirement for these stocks. Other commenters had concerns that NOAA Fisheries would assume the authority to impose a U.S. quota management system for some ICCAT shark species and restrict U.S. catch when it has not been mandated by ICCAT, which could unfairly affect U.S. fishermen. Another commenter opposed NOAA Fisheries establishing U.S. quotas for monitoring purposes, stating that the U.S. pelagic longline fleet is already the most highly monitored fishery in the United States. Lastly, a commenter supported the United States' continued leadership in shark conservation internationally.

Response: The United States has been, and continues to be, a global leader in shark conservation and sustainable management, with NOAA Fisheries at the forefront of advancing shark research and data collection to promote conservation standards. In the Supplement to Draft Amendment 14, NOAA Fisheries explained that the language regarding ICCAT shark stocks needs to be broad, to allow NOAA Fisheries to be flexible with any recommendations (i.e.,

binding measures) adopted by ICCAT. Over the past years, ICCAT has adopted recommendations for certain shark species caught in association with ICCAT fisheries (e.g., blue shark). Recent amendments to the ICCAT Convention, which are not yet in force, have broadened the scope of the species covered by the Convention, including additional elasmobranchs that are oceanic, pelagic, and highly migratory. Pursuant to ATCA, NOAA Fisheries promulgates regulations as may be necessary and appropriate to carry out an ICCAT recommendation. ATCA provides that such regulations shall, to the extent practicable, be consistent with FMPs implemented under the Magnuson-Stevens Act.

Domestically, NOAA Fisheries has long managed Atlantic shark species under the Magnuson-Stevens Act, through a FMP and its implementing regulations, which include annual catch limits, accountability measures and other management measures, consistent with the Act's overfishing and rebuilding mandates, national standards, and other requirements. NOAA Fisheries will continue to manage sharks under that FMP, considering whether any FMP amendment and/or regulatory change is needed in light of a given ICCAT recommendation and ATCA and MSA provisions.

Comment: NOAA Fisheries received a comment in opposition to Management Option A2 (standardized ABC control rule). The commenter asserted that this management option would not be sufficient for shark species since it would not account for specific shark species that are overfished or species that struggle to rebuild their population within the given time period.

Response: NOAA Fisheries agrees that a standardized ABC control rule (Management Option A2) would not be sufficient for shark stocks. This management option would limit management flexibility by creating a one-size-fits-all ABC control rule for all shark stocks without taking into consideration species-specific best scientific information available, which limits NOAA Fisheries' ability to effectively manage those stocks. This approach assumes that scientific uncertainty would be similar for all managed shark species, regardless of stock status or data availability. NOAA Fisheries' risk policy of setting the OFL at 70-percent probability of rebuilding or maintaining healthy status (for most shark stocks) already creates a sufficiently precautionary approach for determining an ABC.

Comments Regarding Phase-In Options (Topic B)

Comment: NOAA Fisheries received support for and opposition to the preferred management option (Option B2) to consider using a phase-in ABC control rule for modifications to the ABC. A commenter supported the preferred option noting that the commercial shark fishery sector has experienced significant disruptions (weather and market) in recent years and a phase-in flexibility would better allow the fleet to adapt to any management changes. A commenter opposed the preferred management option because using a three-year phase-in would extend the timeline for setting sustainable catch levels based on new scientific information and potentially increase the risk of overfishing.

Response: Under Management Option B2, any reduction or increase in ABC, regardless of stock status, could be phased in over a three-year period as outlined in the NS1 guidelines.

During the three-year phase-in period, the ABC must remain under the OFL and NOAA Fisheries must prevent overfishing. NOAA Fisheries will still evaluate each application of an ABC phase-in on a stock-specific basis, in light of the overriding goal for stocks that are overfished/rebuilding to rebuild in as short a time as possible.

NOAA Fisheries prefers this management option because it increases the flexibility in how NOAA Fisheries implements ABCs after stock assessments. Since many shark stocks are unassessed and/ or in an unknown stock status, these shark stocks could see a significant change in ABC after they are assessed. NOAA Fisheries prefers to have the flexibility to phase-in changes to allow constituents time to adjust. NOAA Fisheries recognizes that this approach may have limited impacts on the health of a stock during the phase-in period, but the fishery would be managed below the OFL during the phase-in period and could lead to more stable fisheries over time. However, these impacts would need to be analyzed on a stock by stock basis during relevant rulemakings, prior to implementation of a phase-in ABC.

Comment: NOAA Fisheries received a comment in support of other phase-in ABC control rule management options. This commenter supported a new management option that would combine Management Options B2 and B3, using a phase-in provision for the ABC control rule only if the stock is healthy, to provide the most benefit for both shark populations and NOAA Fisheries' ability to implement larger changes. Other commenters supported Management Options B3 and B4, implementing the new ABC in one year if an assessment indicates a stock to be overfished with overfishing occurring, since they are the most conservative options considered.

Response: NOAA Fisheries prefers Management Option B2 at this time because this option increases the flexibility in how NOAA Fisheries implements ABCs after stock assessments. Many shark stocks are unassessed and/ or in an unknown stock status. These shark stocks could see a significant change in ABC after they are assessed. NOAA Fisheries prefers to have the flexibility to phase-in large changes, allowing stakeholders additional time to adjust to reduced ABCs and stakeholders and markets to adjust to increased ABCs. Combining Management Options B2 and B3 would reduce that flexibility. NOAA Fisheries does not prefer combining Management Options B3 and B4 since they would limit management flexibility to appropriately react to changes in stock status and changes in allowable harvest levels within the fishery. Additionally, those management options would not help reduce the economic impact of having a large reduction in a single year's catch limits and thus would not address potential instability in the fishery.

Comment: NOAA Fisheries received a comment to not allow phase-in ABC control rules once the stock assessment is greater than five years old.

Response: NOAA Fisheries uses the best scientific information available to monitor and manage the federal shark fisheries regardless of when the stock assessment was conducted. If there are either reductions or increases to the ABC, NOAA Fisheries prefers to have the flexibility to phase-in changes under Management Option B2 to allow stakeholders additional time to adjust to the changes. In subsequent rulemakings to implement the ABC control rule framework from Amendment 14, NOAA Fisheries would describe the phase-in of the ABC, if warranted, for each shark stock.

Comments Regarding ACL Options (Topic C)

Comment: NOAA Fisheries received comments in support of actively managing all sector ACLs (commercial and recreational) under Management Option C2. A commenter preferred this option because it matches how the Regional Fishery Management Councils manage their recreational and commercial fisheries. Another commenter requested that ACLs fully account for management uncertainty, all sector ACLs be actively managed, and bycatch limits be established for all shark species. In addition, another commenter suggested that NOAA Fisheries establish AMs for the recreational sector that are equivalent to the commercial sector and fully enforced as in other fisheries.

Response: NOAA Fisheries prefers Management Option C2 because it would allow for the commercial and recreational sectors to be actively managed, and for AMs to be based on separate mortality estimates. Under the preferred Management Option C2, NOAA Fisheries would split the overall ACL into two different sector ACLs (commercial and recreational). As shown in Figure 4, the overall ACL would be set below the ABC to account for management uncertainty. Management uncertainty includes shark mortality from fisheries not managed directly by the NOAA Fisheries HMS Management Division, any research mortality, and expected variability in landings estimates. This overall ACL would be further divided into commercial and recreational fishery sector ACLs, which would be determined in subsequent FMP amendments or regulatory actions.

For the commercial ACL, NOAA Fisheries would continue to actively manage commercial quotas and actively adjust HMS commercial quotas based on dead discard estimates. As for the commercial dead discards, this would include shark fishery mortality (estimated dead discards and/or post release mortality) associated with the shark management group and/or species. These would be accounted for before setting a commercial quota. Shark mortality that occurs outside of HMS fisheries would be accounted for through the management uncertainty buffer set between the ABC and overall ACL. This approach would ensure that the HMS fisheries' mortality counted against the sector ACL matches the mortality used in the assessments. Establishing bycatch limits for shark species is not necessary at this point because the discard estimates are taken into account, as appropriate.

For the recreational ACL, NOAA Fisheries would actively monitor the overall recreational fishing mortality. This would include accounting for the harvest and dead discard estimates for the shark management group and/or species within the recreational fishing sector. The data on recreational mortality for Atlantic sharks are obtained through various regional recreational surveys conducted by federal and state agencies. These surveys provide estimated (i.e., extrapolated) numbers of shark interactions based on data provided by anglers and captains. The data used to establish the recreational ACL would match the recreational data source(s) used in the relevant stock assessment. Regarding underharvest and overharvest of the recreational ACL, NOAA Fisheries would consider management measures to limit mortality by adjusting the bag limits, size limits, gear restrictions, and/or other measures as appropriate on a stock-specific basis the following fishing season based on the three-year average of fishing mortality estimates.

Regarding the comment of establishing AMs for the recreational sector that are equivalent to the commercial sector AMs, NOAA Fisheries is not considering adding any new

AMs for the recreational fishery at this time. Any additional AMs would be considered in subsequent rulemakings, as appropriate.

Comment: NOAA Fisheries received comments requesting more details on the preferred Management Option C2. Commenters asked how NOAA Fisheries plans to actively manage the recreational fishery ACL given the concerns about high variability estimates from MRIP and limited scope of data from LPS; how NOAA Fisheries plans to monitor the commercial dead discards and post-release mortality based on concerns about logbook and observer data; and how NOAA Fisheries plans to provide estimates for all shark species when data are not available for some shark species.

Response: Given the high annual variability of recreational harvest and mortality, NOAA Fisheries would continue to collect recreational estimates through various regional recreational surveys conducted by federal and state agencies. For coastal shark species, the primary data sources in the Atlantic region are MRIP and the NOAA Fisheries Southeast Regional Headboat Survey (SRHS), while in the Gulf of Mexico region, the data sources are MRIP (Florida to Mississippi), the Louisiana Creel Survey (LA Creel), and the Texas Parks and Wildlife Department (TPWD) recreational angler survey. For pelagic sharks, data are from the LPS (Maine to Virginia). NOAA Fisheries plans to use a multi-year average to reduce the significant variability that could occur with the recreational estimates. It would be beneficial for NOAA Fisheries to base any management decisions on multiple years of data to help smooth out the large levels of variability in these estimates. For example, the 2023 recreational ACL for a shark species and/or management group would be based on consideration of all recreational estimate data from 2019 through 2021 and the 2024 recreational dead discard ACL would be based on data from 2020 through 2022.

For the commercial dead discard and post-release mortality, NOAA Fisheries would continue to compile observer data, logbook data, and work with the SEFSC to determine these estimates. This would include HMS and non-HMS fishery data. Like the recreational estimates, NOAA Fisheries believes actively managing and adjusting the dead discard ACLs on a multi-year cycle would be the best method to handle variability in the shark fishery.

As required by the Magnuson-Stevens Act, NOAA Fisheries manages each fishery, including each shark fishery, using the best scientific information available. If data are not available for some shark species, NOAA Fisheries will use the best scientific information available to establish and manage an appropriate ACL for that species. For example, NOAA Fisheries may use a proxy from a similar shark species or fishery to establish the appropriate ACL. However, Final Amendment 14 does not implement management measures or changes to the shark management groups and/or species. Application of the revised framework would take place in subsequent FMP amendments or regulatory actions, with appropriate environmental impacts and other analyses and further opportunity for public comment.

Comment: NOAA Fisheries received a comment in support of incorporating a “reserve” sector ACL (Management Option C3) into the framework to ensure that the overall ACL for both commercial and recreational fisheries are not exceeded.

Response: NOAA Fisheries does not prefer this management option at this time due to the logistics of transferring quota and because it could create unnecessary, additional ACL buffers. For the shark fishery, it would be difficult to appropriately transfer to the commercial and recreational sector ACLs from a "reserve" sector ACL during the season (January 1 through December 31), as mortality estimates from commercial dead discards and recreational harvest would not be available until after a fishing year ends. In addition, a "reserve" sector ACL could create an additional buffer for the OFL on top of the management uncertainty buffer and the scientific uncertainty buffer in the ABC control rule. Thus, a "reserve" sector ACL would just create another buffer that is not needed at this time.

Comment: NOAA Fisheries received comments in support of and opposition to the preferred management option to establish an ACL for each existing shark management group and remove commercial management group linkages (Management Option C5). Commenters supported removing commercial ACL quota linkages because it would allow fishermen to fully utilize all of the quotas and would not affect the fishery with early season closures. Some commenters opposed the management option to remove commercial ACL quota linkages, asserting that these linkages are essential to protect shark species and noting the difficulty of accurately monitoring discards in real time. A commenter expressed that it is inappropriate to remove an AM such as quota linkages without a full analysis of the impacts of this action. Another commenter suggested that actively monitoring the discards and removing quota linkages would directly contradict the position NOAA Fisheries has taken in litigation over its management of dusky sharks. Specially, the commenter is concerned about NOAA Fisheries' ability to monitor shark bycatch and discards in real time or create discard bycatch AMs.

Response: Because NOAA Fisheries prefers to actively manage all sector ACLs under Management Option C2, NOAA Fisheries prefers to remove commercial ACL quota linkages (Management Option C5). At this time, NOAA Fisheries is not amending its regulations to remove the quota linkages, but the agency intends to do so in a subsequent FMP amendment and/or rulemaking with appropriate environmental impacts and other analyses and further opportunity for public comment. The commercial ACL quota linkages have historically negatively impacted the fishery by closing seasons earlier than would otherwise be necessary and, at times, requiring the quota of the linked management group to remain underharvested. To prevent ACLs from being exceeded, NOAA Fisheries would account for potential mortality when the commercial ACL species linkages are removed. NOAA Fisheries would account for any discarded bycatch that may occur when the fishery remains open in the commercial dead discard estimates. In this case, the assumed discards would be increased to cover any additional mortality, which could potentially reduce the commercial ACL quotas for the fishery. Under this preferred option, the fisheries could remain open all year to ensure that each shark management group quota is fully utilized. However, once an ACL is reached or projected to be reached, NOAA Fisheries would close that fishery to prevent overharvesting.

NOAA Fisheries disagrees that removing the commercial ACL quota linkages would harm shark stocks, because NOAA Fisheries would continue to meet the purpose of the quota linkages by actively managing all sector ACLs going forward. Quota linkages were first established in Amendment 5a to the 2006 Consolidated HMS FMP (78 FR 40317; July 3, 2013) to help reduce discards in the shark fishery. Since NOAA Fisheries would be actively monitoring

those discards and adjusting the commercial sector ACL appropriately, removing this measure would not harm shark stocks and could potentially increase the opportunity to utilize the available ACLs. At this time, NOAA Fisheries does not prefer commercial ACL quota linkages due in part to the underutilization of the commercial quota. From 2013 through 2021, NOAA Fisheries closed 13 shark management groups early due to quota linkages. The remaining under-utilized commercial ACL quota during that time period from the 13 shark management groups accounts for 522.7 mt dw, which has gone underharvested by the commercial fishery. In addition, commercial ACL quota linkages have caused fishermen to discard shark species to ensure that certain fisheries remain open longer. In subsequent rulemakings to implement the framework from Amendment 14, NOAA Fisheries would provide the ACLs for each sector, with appropriate environmental impacts analysis and an opportunity for public comment.

The preferred Management Options C2 and C5 do not contradict NOAA Fisheries' management of dusky sharks, because dusky sharks are part of the prohibited shark complex, and Amendment 14 measures only apply to non-prohibited sharks. In addition, the management measures for dusky sharks are specific to that species, and, while Amendment 14 establishes a framework for management of shark stocks and shark complexes, the specific management measures for individual shark stocks and shark complexes will be established in subsequent rulemakings, with appropriate environmental impacts analyses and an opportunity for public comment. In Amendment 5b to the 2006 Consolidated HMS FMP, NOAA Fisheries established management measures to end overfishing and rebuild dusky sharks, which must be achieved through reductions in mortality (82 FR 16478; April 4, 2017). The preferred measures in Amendment 5b achieved the necessary mortality reductions through bycatch reduction measures, 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. Final Amendment 14 is not changing the approach to management of the prohibited shark complex, which includes dusky sharks.

Comment: NOAA Fisheries received comments in support of and opposition to developing species-specific ACLs with quota linkages (Management Option C6). Commenters supporting this management option stated that species-specific information (biomass, catch data, or stock status determinations) are needed to better determine fishing mortality on these shark stocks and assist with rebuilding for some shark stocks faster. Commenters opposing this option felt that there is no need for the significant regulatory and management burdens of species-specific ACLs.

Response: NOAA Fisheries does not prefer this option at this time primarily due to the regulatory burden on constituents and the administrative burden on the Agency caused by monitoring and managing at least 27 different species stock ACLs, not including those species that are prohibited species, which would bring the total to 46 different species-specific ACLs. At this time, this option could cause difficulties in establishing and monitoring numerous species-specific ACLs and potentially cause confusion among the stakeholders from multiple species openings and closures. In some situations, shark species have group TACs recommended by the scientists and other species have not been assessed in a formal stock assessment and lack data to create species-specific ACLs because of identification issues (e.g., Gulf of Mexico smoothhound

sharks, hammerhead sharks). Instead, NOAA Fisheries intends to continue using management groups, but, if needed and shown appropriate based on BSIA, may establish some species-specific ACLs.

Comment: NOAA Fisheries received a comment regarding the development of ACLs and stock status for shark species. The commenter suggested that NOAA Fisheries develop ACLs for some shark species (bull and lemon sharks) based on species-specific landings, and that, in the absence of an assessment, data limited methods can be employed to demonstrate the health of some shark stocks.

Response: NOAA Fisheries appreciates the comment on how to develop ACLs for some of the shark stocks. In the ABC control rule, NOAA Fisheries would consider non-prohibited shark stocks with no assessment under Tier 4. The OFL, ABC, and ACLs would be determined based on the process described above under the ABC control rule management options. NOAA Fisheries plans to develop the ACLs for specific shark stocks in subsequent FMP amendments or regulatory actions, with appropriate environmental impacts analysis and an opportunity for public comment. Once the ACLs are determined, NOAA Fisheries plans to consider using management groups, but could pull out specific species, if warranted.

Comments Regarding Carry-Over Options (Topic D)

Comment: NOAA Fisheries received support for and opposition to allowing carry-over for only underharvests of commercial quotas (landings only) under certain conditions (Management Option D6). Commenters supported this preferred management option since the rebuilding timeframe for shark stocks is based on commercial quotas over that full timeframe and total quota during current rebuilding timeframes would remain the same. They further stated that other factors (weather, market, management measures) outside of commercial fishery participants' control have caused commercial quotas to be underharvested. Another commenter feels a significant buffer between the ACL and ABC would be needed to account for the considerable management uncertainty in the fishery, and ensure that carry-over does not cause overfishing. Other commenters opposed NOAA Fisheries' proposal to allow carry-over of "unused" ACL to the next fishing year and supported Management Option D1 (no action) since carry-over from the previous year would increase the risk of overfishing a species. The commenters noted that the Magnuson-Stevens Act requires NOAA Fisheries to prevent overfishing immediately and rebuild overfished stocks as quickly as possible.

Response: Based on the NS1 guidelines, NOAA Fisheries prefers to allow, for commercial landings only, carry-over of underharvests in one year, to be added to the allowable catch in the subsequent year. Recently, underharvests in the commercial fishery have been a result of a variety of factors, including declines in effort levels, instability in the markets, and various state and federal regulations. This option is preferred because of the high confidence in commercial data, which are census data and updated on a weekly basis, and because it could provide improved opportunities to utilize available quota. NOAA Fisheries would ensure that the ACL and any carry-over would not exceed the ABC.

In implementing Amendment 14 in future rulemakings, NOAA Fisheries would use the best scientific information available to establish proper buffers to prevent overfishing. This would include the management uncertainty buffer and the scientific uncertainty buffer in the ABC control rule. Thus, creating another buffer for the carry-over of underharvest, as suggested by one of the commenters, is not needed at this time. For overfished stocks, the Magnuson-Stevens Act requires NOAA Fisheries to implement management measures as necessary to end overfishing immediately and rebuild overfished stocks over a rebuilding time period specific to the stock. Under Management Option D6, NOAA Fisheries would continue to rebuild the overfished stocks under their rebuilding time periods. Projections for the rebuilding of shark stocks are based on mortality over time; they do not specifically consider if mortality is under or over the TAC in a given year, as long as the overall mortality over time is consistent with the rebuilding timeframe. NOAA Fisheries would provide and consider more details for specific stock in subsequent rulemakings, with appropriate environmental impacts analysis and an opportunity for public comment.

Comment: NOAA Fisheries received a comment opposing a "reserve" sector in the shark fishery (Management Option D4).

Response: NOAA Fisheries agrees that a "reserve" sector is not needed in the shark fishery especially since the preferred ACL management option (C2) does not include a "reserve" sector. Due to uncertainty in some of the data sources, it would make the process more difficult to accurately move quota inseason from a "reserve" sector ACL.

Comment: NOAA Fisheries received a comment in support of not allowing carry-over in the recreational shark fishery sector given that there is less confidence in the recreational data compared to commercial data.

Response: NOAA Fisheries prefers to not allow carry-over in the recreational fishery sector at this time. Recreational data are estimated and usually not finalized until 6 months after the end of the calendar year. Therefore, NOAA Fisheries would not know the underharvest carry-over amount until half-way through the following year.

Comments Regarding Multi-Year Overfishing Status Determination Criteria Options (Topic E)

Comment: NOAA Fisheries received comments in support of and opposition to comparing a three-year average of fishing mortality estimates to the OFL to determine overfishing status (Management Option E3). Commenters supported the preferred management option because it allows NOAA Fisheries to change the stock status to reflect the current stock status without a stock assessment. Commenters not supporting use of multi-year overfishing status determination criteria stated it could explicitly allow overfishing to occur in individual years and averaging years could hide a trend that overfishing is occurring. Another commenter supported the preferred option, but requested that it only be used when the stock is being moved from not experiencing overfishing to experiencing overfishing.

Response: NOAA Fisheries prefers this management option due to the length of time between shark stock assessments, which are often greater than five years. Management Option E3 would have more flexibility in changing stock status to more timely reflect the current stock status of the shark species. This option would allow for more responsive management of shark stocks. Due to the high variability in the dead discard and recreational estimate data used to determine fishing mortality, NOAA Fisheries intends to use a three-year rolling average for this determination to minimize the impact to the fishery, and thus provide more stability to the fishery. The most recent year of estimates would have the highest levels of uncertainty due to the potential of late reports, incomplete surveys, and unverified data. Many shark species are rarely observed in the commercial and recreational surveys, which could result in large confidence intervals in mortality estimates. Some of the data are not finalized until after the start of the following year and annual estimates of catch and interactions are variable year to year. Using such data for annual estimates could result in large annual adjustments in the fishery that may be unwarranted given the lack of precision in the data.

Regarding the comment to only use the preferred option when changing the stock status from not experiencing overfishing to experiencing overfishing, NOAA Fisheries does not believe that would be appropriate given the details above. In order for NOAA Fisheries to have the necessary flexibility in changing stock status to more timely reflect the current stock status of the shark species, limiting how the stock status could change is not the best option.

Comment: NOAA Fisheries received a comment in support of using fishing mortality estimates to determine stock status on an annual basis (Management Option E2), stating that this management option would update stock status and allow more responsive management and more timely action to prevent or end overfishing.

Response: NOAA Fisheries does not prefer this management option given the high annual variability of recreational and commercial harvests and bycatch estimates. The most recent estimates of mortality typically have the highest levels of management uncertainty (e.g., late reports, incomplete surveys). Applying an annual approach to determine overfishing stock status may add greater uncertainty into the management process, and result in management decisions that are either not beneficial to the stock or the stakeholders involved and result in high instability in the fishery.

Comment: NOAA Fisheries received comments in support of Management Option E1 (no action) and requesting that NOAA Fisheries perform more assessments and change the stock status based on assessment results. One commenter stated that NOAA Fisheries would not have to rely on an average of fishing mortality estimates to determine overfishing status of shark stocks if stock assessments were more frequent.

Response: NOAA Fisheries does not prefer Management Option E1 because most shark species can often go five or more years between assessments and the overfishing status can change more quickly than what is captured by assessments conducted under these timeframes. Given the extended periods of time between stock assessments, it would be beneficial to have the ability to evaluate and, if needed, adjust the overfishing status (to either occurring or not occurring) based on the most recent values for the status determination criteria to determine the

new stock status as with Management Option E3. This would allow for more responsive management of shark stocks.

NOAA Fisheries agrees that more timely stock assessments would be beneficial. However, that is not possible due to the time needed to assess a shark stock, the staff needed to conduct an assessment, the number of shark stocks that need to be assessed (42 species for a total of 46 stocks), and overall workload on assessments for other fisheries. Many shark stocks are assessed infrequently, which means that overfishing determinations are made infrequently as well. For example, sandbar sharks were assessed 5 years apart in 2011 and 2016 (overfished and not subject to overfishing), and finetooth sharks were assessed in 2007 (not overfished with no overfishing occurring) with the next assessment scheduled to start in 2024 (14 years later). Thus, NOAA Fisheries prefers Management Option E3 – to compare a three-year rolling average of catch to the OFL to determine overfishing status outside of a stock assessment.

Beyond the Scope of the Amendment

The objective of Amendment 14 is to incorporate additional flexibility into an updated framework for Atlantic shark fisheries, with modifications to the ABC control rule and ACL provisions, and with options regarding overfishing status determinations, carryover, and phase-in of changes in acceptable catch levels, consistent with NS1 and the NS1 Guidelines. The following comments are beyond the scope of the amendment, but for the commenters' information, NOAA Fisheries provides some background and thoughts in response.

Comment: One commenter suggested NOAA Fisheries stop all shark fishing, while another commenter wanted NOAA Fisheries to protect the oceans.

Response: NS1 requires NOAA Fisheries to prevent overfishing while achieving, on a continuing basis, optimum yield from each fishery for the U.S. fishing industry. NOAA Fisheries continually monitors the federal shark fisheries, and based on the best available scientific information, takes action needed to conserve and manage the fisheries.

NOAA Fisheries is responsible for the stewardship of the nation's ocean resources and their habitat. The Agency provides vital services for the nation, all backed by sound science and an ecosystem-based approach to management for productive and sustainable fisheries, safe sources of seafood, recovery and conservation of protected resources, and healthy ecosystems. NOAA Fisheries will continue to ensure that U.S. fisheries are among the world's largest and most sustainable.

Comment: NOAA Fisheries received comments on the decline in the commercial shark fishery. One commenter stated that the commercial shark fishery is declining because of the lack of marketability of shark products, especially with some upcoming federal legislation and current state legislation around the sale of legally harvested shark fins. Another commenter stated their concerns that the state shark fin ban laws are affecting federal shark fisheries and devaluing the fishery including the meat and fin prices.

Response: NOAA Fisheries evaluated the issues impacting the commercial shark fishery and shark depredation in the draft Atlantic shark fishery review (SHARE) document (https://www.fisheries.noaa.gov/action/atlantic-shark-fishery-review-share). The purpose of the SHARE document was to analyze trends within the commercial and recreational shark fisheries to identify main areas of success and concerns with conservation and management measures and find ways to improve management of the shark fishery. Based on this review, current state bans on the sale of shark fins in the United States are one of the factors affecting the sale and trade of products caught by federally permitted U.S. fishermen and dealers in sustainable fisheries. The intent of state shark fin bans generally is to effectively conserve shark populations. However, the vast majority of shark species harvested in federal shark fisheries are species with above-target population levels. In the Atlantic HMS fishery, for example, 77 percent of all U.S. shark landings in 2019 were of four species (smooth dogfish shark, blacktip shark, Atlantic sharpnose shark, and finetooth shark), all of which are not overfished nor subject to overfishing. All other shark landings were from shark management groups with strict quotas that were not exceeded and have rebuilding plans to ensure the shark stocks are sustainable. It is true that unsustainable fishing, habitat loss, and other practices such as shark finning have greatly depleted some shark populations overseas; however, because of laws such as the Magnuson-Stevens Act and years of strict management, many U.S. shark stocks are healthy, and those U.S. shark stocks that were overharvested are rebuilding. NOAA Fisheries plans to address the decline in the commercial shark fishery in a future rulemaking.

Comment: NOAA Fisheries received a few comments regarding the increasing depredation interactions between sharks and other fishing activities. A commenter suggested that NOAA Fisheries complete the short and long-term goals for sharks identified in the Atlantic Highly Migratory Species Management-Based Research Needs and Priorities document, which included quantifying the rates of shark depredation in fisheries, estimating associated economic impacts, and developing ways to reduce depredation. Another commenter expressed that the claim that "too many" sharks are the cause of any perceived depredation issues is incorrect and unsubstantiated.

Response: Recently, NOAA Fisheries submitted a Report to Congress, as directed, to assess and better understand dolphin and shark interactions with private recreational, for-hire (charter and headboat), and commercial fisheries in the Gulf of Mexico and South Atlantic. Reports of shark interactions are increasing in recent years due to potentially learned behavior, rebuilding of some shark populations, increasing fishing effort, and more fish being released and discarded due to more restrictive regulations. However, shark depredation is not a recent phenomenon, as evidenced by photos of shark-damaged catches dating back to the 1930s. Reducing shark interactions with fisheries is complex and challenging. Fishermen in all areas and sectors are experiencing loss of catch, damaged gear, and degraded experiences. Data limitations preclude NOAA Fisheries' ability to fully understand the nature, extent, frequency, and geographic locations of shark interactions with hook and line gear/operations. NOAA Fisheries needs more information to fully understand shark-fishery interactions. Unfortunately, at this time, fishermen have limited tools and options to reduce shark interactions. Additional studies are needed to determine whether non-lethal deterrents can be effective in the long-term. As apex predator populations recover, interactions between humans and sharks are expected to increase.

Comment: NOAA Fisheries received a request to improve fishery dependent and independent data collection along with research on shark depredation. The commenter would like NOAA Fisheries to increase monitoring of shark depredation events through a variety of technology methods or tagging programs to help gather useful data for future stock assessments (for shark and non-shark species).

Response: NOAA Fisheries has identified quantifying depredation rates in all fisheries as a management-based research priority (https://www.fisheries.noaa.gov/resource/document/atlantic-highly-migratory-species-management-based-research-needs-and-priorities), and to that end has begun collecting data available on shark depredation. There is regular data collection on confirmed shark depredation events in some fisheries with mandatory coverage by fisheries observers. As with any recovering apex predator population, interactions between humans and sharks are expected to increase as their stocks and their prey rebuild, although, as noted above, other factors are likely involved in the increased incidences of shark depredation. Including considerations to manage these interactions in a positive way will become increasingly important as shark populations continue to grow. Ultimately, new data collection methods focused on shark depredation in tandem with cooperation and communication between stakeholders could be used to create effective management measures that would provide more economic and fishing opportunities while maintaining conservation tenants under the Magnuson-Stevens Act.

Comment: NOAA Fisheries received a comment regarding prohibited species not being considered in Amendment 14. The commenter was concerned that the current ACL for prohibited species is insufficient and there are no ways to prevent it from being exceeded. In addition, the commenter is concerned that there are no efforts by NOAA Fisheries to collect data for stock assessments for the species on the prohibited list and plans to remove them from the list.

Response: Amendment 14 is not proposing any changes to the approach to management of the prohibited shark complex. NOAA Fisheries addressed those species in Amendment 5b to the 2006 Consolidated HMS FMP, which clarified, among other things, ACLs for the prohibited shark species complex and implemented preventative AMs for the complex (82 FR 16478; April 4, 2017). In addition, Amendment 5b established a mechanism to annually monitor a rolling three-year average of the bycatch to evaluate whether additional measures should be considered.

Stock assessments for prohibited species are often complicated by a near or complete lack of data. However, NOAA Fisheries has tried to find ways 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 higher interaction rates in the fishery. NOAA Fisheries welcomes comments on ways to improve the stock assessment prioritization process, and may consider such changes in the future.

Comment: NOAA Fisheries received comments in support of and against HMS having an SSC. One commenter suggests an SSC would provide more transparency and create a voting body similar to the Regional Fishery Management Councils. Another commenter was against an SSC due to delays that an SSC would cause to the implementation of needed actions.

Response: As described above, NOAA Fisheries conducts most domestic shark stock assessments through the SEDAR process. This process is the same process that the South Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils use to assess their stocks. The only difference between how the Councils treat stock assessments and how federally managed shark stock assessments are treated by NOAA Fisheries is that once the stock assessment is complete at the SEDAR level, the Regional Fishery Management Councils have their SSC review each stock assessment. Under the Magnuson-Stevens Act, SSCs are established to provide advice to Councils, but ultimately, NOAA Fisheries is responsible for ensuring that Council-developed FMPs comply with the Act, including the requirement to use best scientific information available (National Standard 2). NOAA Fisheries does not have its own SSC, but uses an internal review process, consisting of staff from Regional Science Centers and/or the Office of Science and Technology, which provides a separate review of scientific recommendations to ensure they would be consistent with stock status. The internal stock assessment review process ensures that the assessment and stock status determination are scientifically valid, reflective of the current state of each stock, and appropriately take into account the risk policy to rebuild the stock. This whole process is transparent to the public. All of the SEDAR meetings are open to the public and the data provided in the assessment is located on the SEDAR website (http://sedarweb.org/).