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Scoping Document

NOAA FISHERIES

AMENDMENT 14 TO THE 2006 CONSOLIDATED ATLANTIC HIGHLY MIGRATORY SPECIES FISHERY MANAGEMENT PLAN

MAY 2019

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List of Commonly Used Acronyms

993 FMP	1993 HMS Fishery Management Plan
1999 FMP	1999 Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan
ABC	Allowable biological catch
ACL	Annual catch limit
ACT	Annual catch target
AM	Accountability measure
ATL	Atlantic region
BN	Blacknose sharks
BT	Blacktip sharks
DEIS	Draft environmental impact statement
dw	Dressed weight
eDealer	Electronic reporting system collecting HMS dealer landings
EFP	Exempted fishing permit
FMP	Fishery management plan
FR	Federal Register
FRFA	Final regulatory flexibility analysis
GARFO	Greater Atlantic Region Fisheries Office, Permit Office
GOM	Gulf of Mexico region
HH	Hammerhead sharks
HMS	Highly migratory species: Atlantic sharks, tunas, swordfish, and billfish
LCS	Large coastal sharks
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	Maximum fishing mortality threshold
MSY	Maximum sustainable yield
mt	Metric tons
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
Non SB LCS	Large coastal sharks, excluding sandbar sharks
NS	National Standards
OFL	Overfishing limit
OY	Optimum yield
SB	Sandbar sharks
SCS	Small coastal sharks
SEDAR	Southeast Data and Assessment Review
SRF	Shark research fishery
SSC	Scientific and Statistical Committee
TAC	Total allowable catch

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 ten National Standards. Specifically, National Standard 1 (NS1) requires "conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry." In 2016, the National Marine Fisheries Service (NMFS) revised the NS1 guidelines to improve, streamline, and enhance their utility for managers and the public and to facilitate compliance with the requirements of the Magnuson-Stevens Act and provide management flexibility in doing so.

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). With the changes in the NS1 guidelines and given that NMFS is seeking additional management flexibility in establishment of reference points for Atlantic sharks, NMFS is exploring options for implementation of those new provisions as it relates to shark annual catch limits (ACLs). Shark stock assessments are conducted by the SouthEast Data, Assessment, and Review (SEDAR) process and conducted by the science branch of the International Commission for the Conservation of Atlantic Tunas (ICCAT). Species are assessed individually to the extent possible, with matching TACs. In some cases, the available data are not sufficient for estimating a TAC for use in management (e.g., dusky shark). Also, in some cases, TACs for individual species may be aggregated into species complexes for management purposes (e.g., pelagic shark complex, large coastal shark complex, etc.).

Since Amendment 3 to the 2006 Consolidated Atlantic HMS FMP, NMFS has set the acceptable biological catch (ABC), overfishing limit (OFL), and overall ACL equal to the TAC. NMFS has used this ABC to calculate the shark sector ACLs and commercial quotas for the fisheries. In the NS1 guidelines, NMFS defines the ABC as "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 OFL, any other scientific uncertainty, and the Council's risk policy" (see 50 CFR 600.310 (f)(1)(ii)). NMFS defines ACL 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" (see 50 CFR 600.310 (f)(1)(iii)). For the prohibited shark complex, where commercial and recreational retention and landings are not allowed, NMFS has, consistent with NS1 guideline provisions, set the ACL equal to zero, although a small amount of bycatch occurs during other fishing operations.

In this scoping document, NMFS begins the process for re-examining how to establish the ACLs for federally-managed Atlantic shark stocks based on the 2016 final rule updating the NS1 guidelines (81 FR 71858, October 18, 2016), and examines how to establish the ABC and account for uncertainty arising from the stock assessment and the impacts to the management process. Additionally, this document discusses how to establish ACLs in the absence of a full stock assessment and considers changes to carry-over provisions.

NMFS anticipates changes to the management of Atlantic shark species that are in the HMS management unit, based on the guidelines for NS1. This notice requests additional information and comments from the public related to the establishment of such TACs and ACLs. NMFS is considering the scope of the action as it related to the species managed. The document includes a summary of the anticipated purpose and need for the FMP amendment, and the potential environmental, social, and economic impacts of some potential conservation and management options.

NMFS requests receipt of any comments on the Scoping document within 60 days of publishing. Comments received during scoping will assist NMFS in determining the options to be evaluated in an upcoming draft FMP amendment, through a draft environmental impact statement (DEIS) and proposed rule. NMFS anticipates that a proposed rule and DEIS will be available in late 2019 and the Final Amendment 14 and its related documents will be available in 2020.

Any written comments on this document should be submitted to Ian Miller, HMS Management Division, F/SF1, Office of Sustainable Fisheries, 1315 East West Highway, Silver Spring, MD 20910 or via the Federal e-Rulemaking Portal (www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2019-0040) by July 31, 2019. For further information, contact Ian Miller, Guý DuBeck, or Karyl Brewster-Geisz at (301) 427-8503.

1.1 Management History

In 1993, NMFS 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 that are the basis for those in place today, including permitting and reporting requirements, management complexes, commercial quotas, and recreational bag limits. Many of the methods for establishing the commercial quotas in effect currently relate back to those established in the 1993 FMP.

Over the years, NMFS has implemented various management measures for Atlantic shark fisheries, including revised quotas and a mechanism for establishing ACLs. Some of these measures are discussed below. For more detailed information, please see the 1999 FMP for Atlantic Tunas, Swordfish, and Sharks (1999 FMP), Amendment 1 to the 1999 FMP, the 2006 Consolidated Atlantic HMS FMP, and Amendments 2, 3, 5a, 5b, 6, 9, and 11 to the 2006 HMS FMP.

1999 Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks

Some management practices from the 1993 FMP were changed in the "FMP for Atlantic Tunas, Swordfish, and Sharks and Amendment 1 to the Atlantic Billfish FMP" (64 FR 29090; May 28, 1999) (1999 FMP). 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. However, compared to other HMS and fish species, many shark species are slow growing, take a long time to mature, have few pups, and generally reproduce only every two or three years. Due to these life history traits, many shark species have a low reproductive potential. Thus, as described in the 1999 FMP, when addressing management measures for overfished Atlantic shark stocks, NMFS generally uses an objective of rebuilding 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, NMFS 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 specifies that NMFS will 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), NMFS 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 ensure that optimum yield (OY) could be harvested from the fisheries. For stocks that were not overfished, OY was 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 to be adjusted as appropriate based on any over- and/or underharvest from the relevant fishing season in the previous year.

Amendments 2 and 3 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 closure of specific shark fisheries with five days' notice once 80 percent of the quota was harvested. This closure approach provided a management buffer for landings that may have occurred outside of federal waters but that are counted against the quota (e.g., state landings) or were reported and/or accounted for after the season closed.

Amendment 3 to the 2006 Consolidated HMS FMP (75 FR 30484; August 17 2010) instituted, among other things, a mechanism for establishing ACLs and AMs for each of the shark management groups, consistent with the 2009 NS1 guidelines related to ACLs and AMs and reference points (74 FR 3177; January 16, 2009). Under the mechanism, when NMFS receives a biological reference point such as the overfishing level (OFL) or acceptable biological catch (ABC) from an Atlantic shark stock assessment, NMFS uses that information to calculate the annual catch limit (ACL). In practice, ABC has not been designated in recent Atlantic shark stock assessments, so NMFS has set the ABC, OFL, and ACL equal to the TAC recommended in the stock assessment. The ABC may then be 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. The commercial sector ACL is set the same as the commercial quota. NMFS closes a commercial shark fishery when landings reach 80 percent of the commercial quota, which is the annual catch target (ACT) (note: this has since been modified to close at 80 percent only if NMFS determines that the commercial quota would be exceeded by the end of the year). NS1 guidelines require NMFS to establish accountability measures (AMs) to ensure that the ACL is not exceeded. Under the AMs for Atlantic shark fisheries, other than prohibited sharks, if the overall ACL for any species or management group is exceeded (overharvested),

regardless of the sector that harvested it, the commercial quota for that species or management group is reduced by that amount the following year. If the overall ACL is underharvested, the commercial quota can be adjusted upwards, the following year, if the stock or management group is not overfished and there is no overfishing occurring, or the stock has not been determined to have an unknown status. This mechanism has remained unchanged since 2010, however measures for the prohibited shark complex were subsequently clarified in Amendment 5b (82 FR 16478; April 4, 2017).

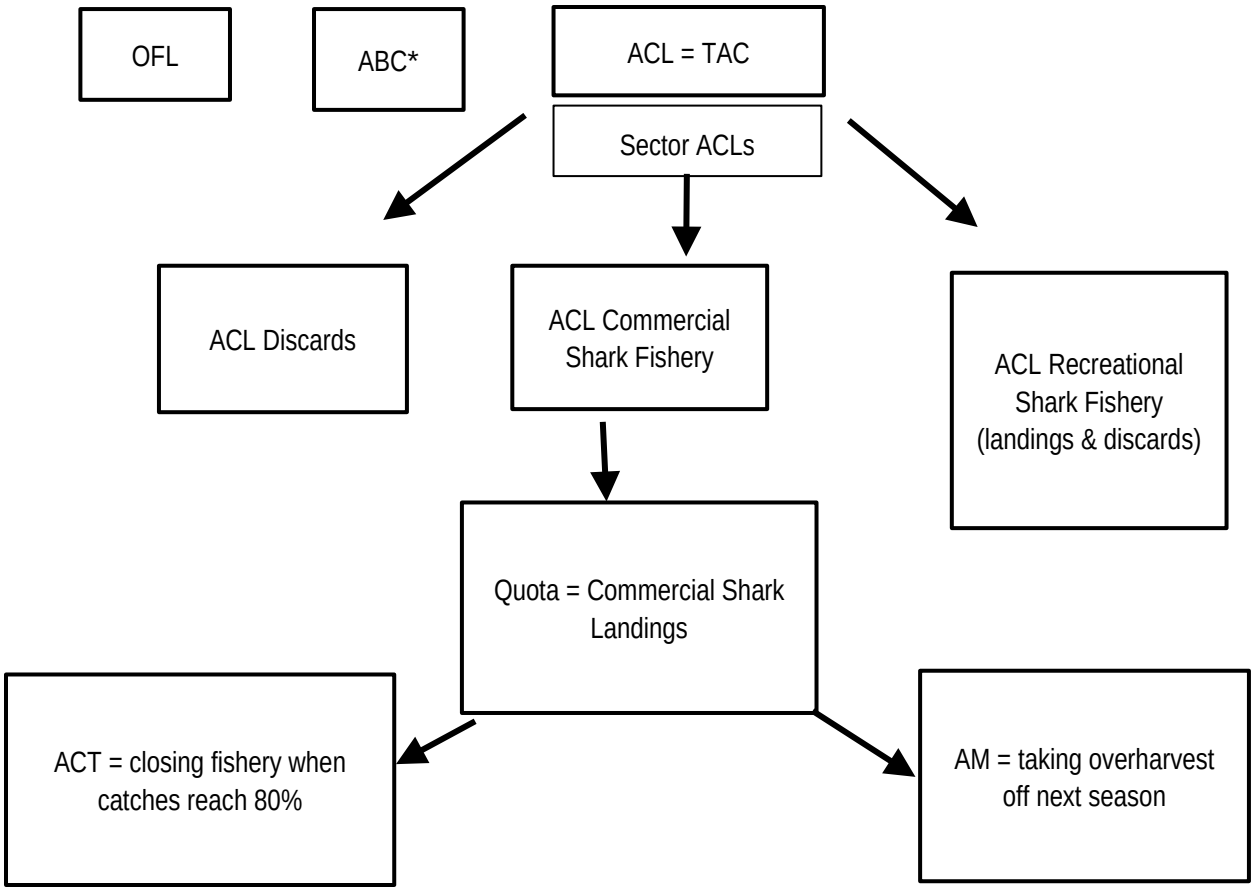

Figure 1.1 Generalized Mechanism for Establishing ABCs/ACLs under Amendment 3

*Currently, ACL = ABC as no ABC has been designated in recent shark stock assessments; future shark stock assessments will be asked to identify an ABC.

Amendment 5b to the 2006 Consolidated HMS FMP

Amendment 5b to the 2006 Consolidated HMS FMP, among other things, clarified ACLs for the prohibited shark species complex and implemented preventative AMs for the complex (82 FR 16478; April 4, 2017). This amendment clarified the ACL for the prohibited shark complex to be zero, consistent with provisions in the NS1 guidelines. Under the NS1 guidelines, if an ACL is set equal to zero and the AM 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).

According to the available analyses, prohibited shark species—basking sharks (Campana 2008), night sharks (Carlson et al. 2008), sand tiger sharks (Carlson et al., 2009), white sharks (Curtis et al. 2014), and bigeye thresher sharks (Young et al. 2016)—are not experiencing overfishing. Dusky sharks are within the complex and were experiencing overfishing, and Amendment 5b adopted additional AMs for that stock. While such analyses have not been completed for all other prohibited shark species, there is no information suggesting that overfishing is occurring on other members of 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. (Refer to the DEIS for Amendment 5b for more detail). NMFS does not anticipate that changes to this approach for managing the prohibited shark species complex would be necessary through Amendment 14, as it is consistent with the NS1 guideline provisions and was updated very recently in Amendment 5b.

1.2 Purpose and Need

Given revisions to the NS1 guidelines in 2016, which aimed to improve compliance with the requirements of NS1 and streamline the guidelines to enhance their utility for managers and the public, NMFS is exploring options for modifying or establishing reference points and increase management flexibility for Atlantic shark fisheries under its management. The purpose of this action is to manage the shark fishery resources in a manner that is consistent with the conservation requirements of the Magnuson-Stevens Act in NS1 and other requirements of the Act while minimizing to the greatest extent possible any negative socioeconomic and ecological impacts on affected fisheries. This action would be consistent with the revised 2016 NS1 guidelines along with relevant statutes and the 2006 HMS FMP and its amendments. The HMS shark regulations govern conservation and management of sharks in the management unit, under the authority of the Magnuson-Stevens Act. For sharks, the "management unit" means all fish of the species listed in Table 1 of Appendix A to 50 CFR 635, in the western North Atlantic Ocean, including the Gulf of Mexico and the Caribbean Sea. For some shark stocks caught in association with ICCAT fisheries, ICCAT adopts conservation and management measures, and NMFS implements them consistent with ATCA. NMFS welcomes comments on the appropriate scope of the action as it relates to the species with management measures under ICCAT.

The need for Amendment 14 is to review the process for setting ABCs as related to the OFL and ACLs, to determine if changes are needed and whether the associated AMs need to be modified. Additionally, the revised NS1 guidelines provide guidance on ABC phase-in, quota carry-overs, and overfishing determinations. As part of this review, NMFS intends to review the currently-codified measures to determine whether to incorporate additional management flexibility in the process for setting ABCs, ABC phase-in, quota carry-overs, and overfishing determinations provided by the revised NS1 guidelines. This document is part of the scoping process for Amendment 14 and the associated rulemaking.

The goal of this scoping document is to identify potential options to consider modifying domestic shark management if warranted to be consistent with the current NS1 guidelines, and to consider additional tools to potentially 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. It is also a mechanism to request additional information and input on these subjects from consulting parties and the public, prior to development of a DEIS and proposed rule.

1.3 Objectives

To achieve the purpose and need for this action, NMFS would consider implementing management measures if warranted to be consistent with the current NS1 policy guidelines. For Atlantic shark stocks, NMFS has identified the following objectives with regard to this action:

- Consider the need to revise the ABC control rule methodology to ensure harvest does not exceed the OFL or equivalent measurement/proxy.
- Evaluate the process for establishing ACLs for all non-prohibited shark species within the HMS management unit.
- Evaluate the process for determining acceptable levels of rebuilding success.
- Consider a process for addressing the distribution of under- and over-utilized sector ACLs for shark species within the HMS management unit.
- Consider increasing management flexibility to account for changes in harvest of sharks by sector.

2 Potential Management Options

In this section, NMFS examines an initial range of options for possible consideration in a future proposed rule to address management needs for the Atlantic shark fisheries. The management options explore integrating carry-over, phase-in, and ABC control rule provisions, and multi-year overfishing definitions of the 2016 revised NS1 guidelines.

2.1 ABC Control Rule

2.1.1 Objective and Rationale

An ABC control rule is an established policy that defines how the ABC would be set compared to the OFL. ABC control rules take into account scientific uncertainty as well as an established risk policy (e.g., the acceptable probability that catch equal to the ABC would not result in overfishing). NMFS originally defined a risk policy for HMS species in the 1999 HMS FMP, which was incorporated into the 2006 Consolidated HMS FMP and states that the rebuilding target should have at least a 50 percent chance of success, although 70 percent has been used for sharks, with two exceptions. These same percentages are used to ensure catch would not result in overfishing. Because the ABC cannot exceed the OFL estimate, ABC control rules generally specify the amount by which the ABC should be reduced from the OFL, based on the level of scientific uncertainty and the established acceptable probability that such a catch level would not result in overfishing.

NS1 Guidelines require that all domestically managed fisheries required to have an ABC have ABC control rules to account for scientific uncertainty and ensure catches are under the OFL. Since Amendment 3 to the 2006 Consolidated HMS FMP in 2010, and because Atlantic shark stock assessments have not provided an OFL, NMFS has set the ABC equal to the OFL, which it has set equal to the TAC (which is provided by the stock assessments). Options for ABC Control Rule

The following are four potential options that NMFS currently is considering for an ABC Control Rule.

> **Option 1: 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 Option 1, NMFS would maintain the current management structure for sharks. Because the current structure does not have a scientific uncertainty buffer built in between the OFL, ABC, and ACL, this option could result in overfishing, although the 70 percent probability of meeting the rebuilding and overfishing requirements accounts for some of this uncertainty. If this happens often enough, then there could be short- and long-term implications for the health of the stocks and the fisheries.

Pros:

- Allow continuity in management measures for fisheries to operate the same as in the past.
- Would have no new negative economic impacts in the short-term unless commercial quotas are exceeded.

Cons:

- There is potential to exceed, on average, the OFL, resulting in overfishing over the long-term.
- Potential to exceed the OFL on the short-term, since reference points used to account for management uncertainty are not established.
- Would not adequately account for scientific uncertainty.
- Difficult to calculate ACLs for stocks that do not have an assessment.

Option 2: Modify current ABC control rule methodology to create a standardized ABC control rule for Atlantic shark species and/or management groups, if warranted.

Under Option 2, NMFS would modify the current ABC control rule methodology to create a standardized ABC control rule for federally managed shark species and/or management groups, if warranted. For example, NMFS could set the ABC for each species or management group at 75 percent of the species' or management group's OFL or proxy. In the cases where an assessment is not available, NMFS could set the ABC at some percentage of average harvest for sharks across all sectors.

Shark harvest in each sector can be highly variable from year to year. Additionally, the estimates of harvest also can be variable on an annual basis. A standardized ABC control rule may be used to account for the variability in harvest estimates and prevent harvest from exceeding the overfishing limit (OFL) or proxy by creating management reference points that are used to account for the uncertainty in harvest. Additionally, a lack of scientific information regarding biological conditions and stock status could be accounted for by creating a standardized ABC control rule.

Pros:

- Accounts for scientific uncertainty by creating a standardized rule that would be used for all levels of data availability and quality.
- A standardized ABC control rule could simplify management actions, and provide consistency in the allocated quotas.
- Potential long-term economic gains as a result of improved health and abundance of stocks from decreasing the risk of overfishing.

Cons:

- A standardized ABC control rule would not address how scientific uncertainty may vary for individual stocks. A standardized control rule—a "one-size-fits-all" approach—may not fit all stocks.

- A standardized ABC control rule would not account for differences in data quality or availability between species and/or management groups due to assessment status. Some stocks may not have an assessment or assessments may be outdated.
- Implementation of an ABC control rule different from the current rule could lead to a reduction in quota, which would have negative economic impacts.

Option 3: Create a tiered ABC Control Rule.

Under Option 3, NMFS would create a tiered ABC control rule that further accounts for risk of overfishing or probability of rebuilding, as applicable. For example, the tiers could be based on whether or not the stock is assessed, and/or the vulnerability of the stock to overfishing, or the amount of data available for the stock. . Stock data may have different levels of scientific uncertainty (e.g., data-rich, data-moderate, and data-limited), and managers could be explicit about their risk tolerance within the ABC control rule. Stocks with greater uncertainty in their OFL and/or greater vulnerability to overfishing may require more risk-averse ABC control rules. These tiers will directly relate to NMFS' risk policy in selecting the probability of rebuilding and/or ending overfishing, or maintaining healthy stock status. In the cases where an assessment is not available, NMFS could set the ABC at some percentage of average harvest for sharks across all sectors.

Pros:

- The ABC control rule would be based upon the best scientific information available for each species and/or management group.
- Accounts for scientific uncertainty by creating a control rule that is adapted to levels of data availability and quality.
- Creates a methodology for adjusting the ABC control rule for a stock by building a framework based on data quality and availability.

Cons:

- Thresholds for data-rich, data-moderate, and data-limited can be subjective.
- ABC control rules based on data availability could result in complex management actions, and provide uncertainty within the fishery throughout the fishing year.
- ABC control rules based upon data availability could lead to a reduction in quota for stocks that are data-limited.

Option 4: Develop a peer review process for determining the ABC Control rule.

Option 4 would develop a peer review process to help determine the appropriate ABC control rule. While SEDAR stock assessments are peer reviewed and NMFS ensures the current process for establishing ACLs is scientifically based, NMFS does not have a Scientific and Statistical Committee (SC) for Secretarially-managed Atlantic HMS similar to those for Fishery Management Councils, which use SSCs to review stock assessments, apply ABC Control Rules, and make ABC recommendations for the stocks that they manage. Under this option, NMFS would develop a peer review process for Atlantic sharks that would play a role similar to a Council SSC. This peer review

process could be a more formally established internal (NMFS-only) review process, an external process (e.g., academics, Council SSC members), or some combination of both.

Pros:

- Could make the ABC-setting process for Atlantic sharks more transparent, which might be more consistent with the process the Councils use.
- Could improve public confidence in the scientific determination that the specified ABC would have a low risk of resulting in overfishing.
- Further incorporates objective scientific review and expertise into control rule establishment and resulting responsive management measures.

Cons:

- Adds additional complexity to the management process. Requires expertise of individuals who may not have previously been engaged in review of HMS data or assessments.
- Requires additional time between a final stock assessment and implementation of responsive management measures for the review process to take place.
- External processes and reviews may require additional steps to comply with existing statutes.

2.2 Phase-in ABC Control Rule

2.2.1 Objective and Rationale

In some circumstances, such as when a new stock assessment dramatically changes our understanding of the status of a stock, another type of ABC control rule described in the 2016 NS1 guidelines could be utilized. These ABC control rules, known as carry-over/phase-in ABC control rules, allow Councils to respond to certain circumstances within the fishery while still accounting for scientific uncertainty and preventing overfishing. To help stabilize fisheries in the short-term, the 2016 revised NS1 guidelines allow for the development of an ABC control rule that gradually phases-in changes to catch limits over a period of time not to exceed three years, as long as overfishing is prevented each year. Additionally, the NS1 guidelines indicate that any ABC established cannot exceed the OFL, therefore, the phase-in approach cannot be used to allow mortality at a level at which overfishing is occurring. The guidelines advise that managers should evaluate the appropriateness of phase-in provisions for stocks that are overfished and/or rebuilding, as stocks must be rebuilt in as short as time as possible, consistent with provisions in the guidelines The following are some options that NMFS could consider.

2.2.2 Options for Phase-In ABC Control

The following are four potential options that NMFS is considering for a phase-in of ABC Control Rule.

Option 1: 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 Option 1, NMFS would not use a phase-in ABC control rule. NMFS would reduce the ABC below the OFL in one step.

Pros:

- Any ABC reduction would be implemented at once instead of over time.
- ABC control rule would reduce the ABC to ensure it remains under OFL.
- Would implement consistent baseline quotas from the first year, reducing confusion in the fishery.
- Could have beneficial ecological impacts, as the reduction to the new ABC would occur at once instead of over time.

Cons:

- Potentially greater economic impact in the first two years of implementation due to sudden reduction in ABC compared to using a phase-in ABC control rule.
- Less flexibility in implementation, because the ABC reduction is implemented immediately.

Option 2: Use phase-in ABC control rules for any reductions in ABC.

Option 2 would use phase-in ABC control rules for any reductions in ABC. Under this option, NMFS would have up to three years to gradually implement a new ABC in a stepwise fashion.

Pros:

- Increased management flexibility to account for the status of the stock.
- Reduce immediate socioeconomic impacts on the fishery by minimizing drastic reductions in allowable levels of catch.

Cons:

- May have a greater biological risk in potentially overfishing a stock, which may not be in line with the risk policy for the stock.
- If the stock is overfished or rebuilding, may increase the rebuilding timeframe for the stock.
- Could increase regulatory burden on NMFS to determine the appropriate phase-in actions for each stock.
- May result in confusion and uncertainty in the fishery by having an ABC that changes every year for three years.

Option 3: Use a phase-in ABC control rule unless the stock is in an overfished or overfishing status.

Under option 3, NMFS would use a phase-in option for the ABC control rule only if the stock is not overfished and overfishing is not occurring. NMFS would implement the new ABC in full in one step if an assessment determines a stock to be overfished and/or overfishing is occurring.

Pros:

- Could reduce socioeconomic impacts if ABC reductions are phased in when the stock is neither overfished nor experiencing overfishing, thus reducing the initial impact on the fishery.
- May minimize probability of continued overfishing and expedite rebuilding in cases where the stock is determined to be overfished or experiencing overfishing.

Cons:

- Could result in greater negative socioeconomic impacts in the first year if there is a sudden reduction in ABC for a stock that is either overfished or experiencing overfishing.
- Less flexibility in implementation of the ABC control rules if a phase-in approach is limited to stocks that are not overfished and are not experiencing overfishing.

Option 4: Flexibility to use a phase-in ABC control rule, unless the stock is in both an overfished and overfishing status.

Under option 4, NMFS would implement the new ABC in full in one step if an assessment determines a stock to be both overfished and overfishing is occurring. In the event a stock is not both overfished and in an overfishing status, then NMFS would have the option to phase in the reduced ABC to minimize economic impact to the fishery.

Pros:

- Could minimize socioeconomic impacts if ABC reductions are phased in when the stock is not overfished and experiencing overfishing, thus reducing the initial impact on the fishery.
- May minimize probability of continued overfishing and expedite rebuilding in cases where the stock is determined to be overfished and experiencing overfishing.

Cons:

- Could result in greater negative socioeconomic impacts in the first year due to sudden reduction in ABC when the stock is overfished and experiencing overfishing.
- Less flexibility in implementation of the ABC control rules if a phase in approach is limited to stocks that are not both overfished and experiencing overfishing.

2.3 ACL Development

2.3.1 Objective and Rationale

As described above, Amendment 3 established the procedures currently used to set the overall ACL for a fishery. To calculate the commercial sector ACLs (also known as the commercial quota), NMFS subtracts the average mortality estimates from recreational harvest, discards from commercial fisheries, and harvest from scientific research, from the overall ACL. Because the overall ACL is currently set equal to the ABC and the OFL, which is based on the TAC (ABC proxy) identified in a stock assessment, this process does not leave a lot of flexibility for adjustments. Thus, we are considering ways to build in flexibility that would account for management uncertainty and provide for the ability to redistribute any unused quota or carry over quota into future years and potentially to different sectors.

2.3.2 Options for ACL Development

Following are five potential options that NMFS is considering for ACL development.

Option 1: No Action. No change to the current mechanism.

Under Option 1, NMFS would maintain the existing process for all species and/or management groups of subtracting the average mortality estimates used for establishment of ACLs during Amendment 3 resulting from recreational fishing, commercial discards, and research from the overall ACL to derive the commercial sector ACL. Using this process, the entire overall ACL is fully distributed to the different sectors. The commercial shark management groups would continue to close when landings reach 80 percent of the commercial sector ACL.

Pros:

- The current process of ACL distribution is simple and transparent.
- The sector ACLs for recreational harvest, discard mortality, and scientific research activities are not impacted by any change in the overall ACL.

Cons:

- This process assumes that mortality from commercial landings, recreational harvest, and dead discards would remain the same throughout time. This process would only be able to increase or decrease the sector ACL for commercial landings.
- The current process for sector ACL distribution would not allow for the implementation of the new carry-over provisions in the NS1 guidelines, which could provide additional management flexibility to be responsive to the needs of the stock and the fishery see next section).

Option 2: Actively manage all sector ACLs (recreational fishing, commercial harvest, commercial discards, and scientific research fishing).

In option 2, NMFS would create four actively managed sector ACLs. Under this option, the overall ACL would be split into four different sector ACLs using information about the harvest from the sectors. Thus, NMFS would establish specific and explicit sector ACLs or quotas for commercial landings, recreational harvest, and dead discards. NMFS would then manage and actively open or close these sectors.

Pros:

- This process of ACL distribution is simple and transparent.
- By actively managing all parts of the shark fisheries through sector ACLs, NMFS could apply AMs to all sectors, not just the commercial landings sector.

Cons:

- Recreational fishing mortality estimates for most species of sharks are highly uncertain. Actively managing a sector ACL for recreational shark fisheries may not be practicable.
- In some cases, commercial dead discard estimates are only provided in shark stock assessments. In between stock assessments, commercial dead discard estimates would be held static and would not account for management changes.
- Opening and/or closing fisheries based on dead discards may not be practicable.
- Active management of sector ACLs could increase the administrative burden and potentially impact timing of openings and closings.

Option 3: Establish a "reserve" sector ACL.

Option 3 could be applied to either Option 1 or 2, and in both cases, NMFS would create a "reserve" sector ACL, which would be subtracted from the overall ACL. 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. NMFS will develop a criteria to determine the appropriate distribution to a 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.

Pros:

- Reserve sector ACL could serve as a buffer from harvest exceeding the ABC.
- Could allow for inseason transfers of quota from the reserve sector ACL to another sector (e.g., the process currently used in the bluefin tuna fishery). Being able to fully utilize quotas by transferring reserve ACL to sectors that are fully harvesting their quota could create economic benefits.

Cons:

- Each sector ACL (Option 2) or the commercial landings sector (Option 1) would be reduced to create a reserve sector ACL.

- Due to data uncertainty, the amount in the reserve sector ACL may be larger than expected, resulting in forgone yield and negative economic impacts on user groups.
- Inseason transfers from the reserve sector ACL could be delayed by regulatory processes.

Option 4: Establish an ACL for each management group as a whole, without a focus on individual species.

Option 4 would establish an overall ACL for each management group as a whole rather than for individual species. For example, the current commercial quota for Atlantic aggregated LCS, as established in Amendment 5a, is based on the proportional average annual landings of each component species, without establishing an ACL for each component species. Indicator species would be used to manage the ACL of the management group, so that any species that is overfished or experiencing overfishing would not be overharvested. The management groups could be established around species caught in similar gear types, at similar times of the year, or in certain regions or sub-regions, which could lead to modifying the species currently in each management group.

Pros:

- Less extensive stock assessment needs as management group ACLs would be developed from the stock with the smallest TAC.
- Developing ACLs for sharks would be less complex than the current process.

Cons:

- Differences in data quality between species within a management group may make it difficult to determine what species should be the indicator species for that group.
- Potential for overharvest of the most vulnerable species in a management group.
- This approach is similar to the approach started in the 1993 FMP and may not adequately address the different needs (e.g., biological) of the different shark species.
- Some species are caught by multiple gear types, making it difficult to determine which management group to place them in.
- Different shark species can be caught at different rates with the same gear type. This inequity in selectivity of gears could make it difficult to choose one species over another as an indicator species.

Option 5: Create species-specific ACLs, without species linkage considerations.

Under Option 5, NMFS would create species-specific ACLs, independent of the status of other species. Under this option, there would be no species-linkages. Each species of shark would have its own ACL and be managed to it. For example, currently the hammerhead shark management group is linked to the aggregated LCS management group. Both these management groups open or close together, when landings of either group reaches 80 percent of the annual quota. Under this option, these management groups would no longer be linked. Additionally, under this option, there would be no management groups. For example, each hammerhead species (great, scalloped, and smooth)

would be managed separately with its own ACL. Scalloped hammerheads could be open while great hammerheads are closed.

Pros:

- Creating ACLs for individual shark species could allow full utilization of the ACL for each species, because harvest of one species would not limit the harvest of another (e.g., "choke" species).
- Uncertainty related to species linkages in management groups would not affect the management of specific species.

Cons:

- Absent linkage to other stocks, a species specific ACL may not adequately prevent bycatch of that species in other fisheries.
- Shark season rules would need to have opening and closing dates for individual shark species and could require species-by-species retention limits, which could differ, resulting in a management regime that would require real-time tracking and more inseason actions, which may not be practicable and could make compliance difficult for the industry.

2.4 Carry-Over Options

2.4.1 Objective and Rationale

The 2016 revised NS1 guidelines include provisions that allow managers to develop carry-over provisions within the ABC control rule. It is important to note that the NS1 guidelines describe two approaches that Councils, or the Secretary in the case of Secretarially-managed species, may use to carry-over some portion of any ACL underage into the next fishing year. These two approaches are:

1. *Utilizing ACL buffer:* If the ACL is lower than the ABC and there is an underharvest, a Council may account for it by adjusting the next year's ACL upwards (by adding all or part of the underharvest) as long as the new ACL with the underharvest added does not exceed the pre-specified ABC for the next year.

2. *Utilizing a carry-over ABC control rule:* A carry-over ABC control rule establishes a policy that allows Councils to carry-over some portion of an ACL underharvest into the next year by adjusting the ABC upwards to account for the increased stock biomass that results from an ACL underharvest. The revised ABC cannot exceed the OFL; therefore, the degree to which ABC can be adjusted is limited by the OFL.

2.4.2 Options for Carry Over

The following are five potential carry over options that NMFS is considering.

Option 1: No Action. Allow up to 50 percent carry-over of the commercial landings sector ACL if a stock is not overfished, experiencing overfishing, or not in an unknown status

Under Option 1, NMFS would maintain the current management structure that allows for carry-over of up to 50 percent of unused ACL into the following year.

Pros:

- Reduces confusion by maintaining the current approach that people are familiar with.
- Allowing unused ACL to be carried forward provides opportunities to fully utilize ACLs.
- Only allows carry over for stock in a healthy status and limits carry over to commercial sector ACL.

Cons:

- Allowing the full 50 percent carry-over has the potential to exceed the overall ACL for a shark species or management group, particularly if recreational harvest or dead discards are high in that same year.
- Does not ensure the ACL would not exceed the OFL, as the overall ACL currently equals the OFL.

Option 2: Distribute any unused ACL to the sector where the underharvest occurs.

Option 2 would distribute any unused ACL to the sector 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. Underharvest may be a result of changes in effort or management constraints. This redistribution back to the sector that accounted for the underharvest ensures equity in disbursement. This redistribution would only have an effect on the sector that did not fully utilize their ACL by increasing their ACL the following year. Because this increase must remain under the ABC, the entire unused portion may not be carried over.

Pros:

- Maximizes utilization of quota for under-harvested sectors.

Cons:

- If underharvest is a result of regulatory restrictions that prevent full ACL utilization, redistribution of underharvest to the same sector that is restricted by regulations would not increase opportunities to utilize the ACL.
- As described above in the alternatives regarding establishing ACLs, actively managing the recreational harvest and dead discard sector ACLs may not be practicable.

Option 3: Distribute any unused portion of ACLs across all sectors based on the regulatory proportion of the sector ACL distribution.

Under option 3, the unused ACL that is carried over would be distributed based on proportion of the sector ACL distribution specified in the regulations. The unused ACL would be carried forward regardless of which sector the under-harvest occurred in, as long as the overall ACL does not exceed the ABC. As with Option 2, because this increase must remain under the ABC, the entire unused portion may not be carried over.

Pros:

- Allows all sectors to receive some carry-over from unused ACL.
- Provides opportunity to maximize utilization of ACL by allowing access to carry-over to all sectors.
- Some sectors may see an economic benefit provided by increased ACLs from carry-over.

Cons:

- Could result in the overharvest of individual species within a management group where the ACL is set for the management group as a whole.
- The underharvest may be a result of regulatory restrictions that prevent full ACL utilization.
- As described above in the alternatives regarding establishing ACLs, actively managing the sector recreational harvest and dead discard ACLs may not be practicable.

Option 4: Allow for carry-over of any underharvest, as long as the overall ACL remains below the ABC.

Option 4 would provide flexibility for full utilization of the ACL, as the unused ACL would be carried forward on an annual basis. Only the unused ACL allocated to the previous fishing year would be carried forward.

Pros:

- Allows all sectors to receive all unused ACL, provided the new ACLs are under the ABC.
- Economic benefits for fishermen in all sectors since underharvest could be carried forward to provide more fishing opportunities.
- Would not have an ecological impact to the stock since the overall ACL would remain below the ABC.
- May reduce perceived urgency of fisherman to fish in suboptimal conditions in order fully harvest ACL in a given year.

Cons:

- Does not encourage maximum utilization within a fishing year, since the unused ACL would be carried over in the following year.
- Underharvested carry-over could cause administrative burden and delays due to the regulatory process to move the unused ACL.

Option 5: Allow for carry-over of underharvest but limit the carry-over to a percentage of the overall ACL.

Under option 5, unused portions of the overall ACL would be carried forward on an annual basis. Only the ACL allocated to the previous fishing season would be carried forward annually. Limited percentage carry-over accounts for uncertainty in reporting, landings and the biological condition of shark stocks.

Pros:

- Allows all sectors to receive a percentage of the underutilized ACL, provided the new ACLs are under the ABC.
- Economic benefits for fishermen in all sectors that receive carry-over.
- Carry-over of a percentage of the ACL to account for data uncertainty and variability in data collection.

Cons:

- Does not encourage maximum utilization within a fishing year since up to a certain amount of the ACL would be allowed to be carried over.
- Carry-over of a percentage of the ACL could cause administrative burden and delays due to the regulatory process to move the unused ACL to the appropriate sector.

2.5 Multi-Year Overfishing Status Determination Criteria

2.5.1 Objective and Rationale

Currently, the 2006 Consolidated HMS FMP defines overfishing of sharks as occurring when fishing mortality (F) is greater than the fishing mortality at maximum sustainable yield (F_{MSY}), for any shark species and/or management group. Typically, for sharks, estimates of F are only obtained when a stock assessment is completed.

The 2016 revised NS1 guidelines allow a multi-year approach to be used to determine overfishing status. The NS1 guidelines explain that managers should identify in their FMP or FMP amendment circumstances under which the multi-year approach is appropriate and would 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 ACLs at levels that do not prevent overfishing.

2.5.2 Options for Multi-Year Overfishing Status Determination Criteria

The following are five potential options that NMFS is considering for multi-year management approaches.

Option 1: No Action. Do not allow for multi-year overfishing stock determination criteria; overfishing occurs when F > MFMT = FMSY; Stock Status and target reference points would not change without a stock assessment.

Option 1 maintains the current overfishing status determination criteria. Specifically, any stock status change would not occur without a stock assessment. Target reference points would not change without an assessment. Target reference points refer to the level of fishing mortality or to the stock biomass level, which permit a long-term sustainable yield.

Pros:

- Stock assessments are generally considered the best available science and the most reliable method of determining the status of a stock.
- Could prevent uncertainty in data quality from other sources affecting management decisions.

Cons:

- Reduced flexibility in management by only using stock assessment information.
- Time periods between stock assessments could cause delays in implementing responses to changes in stock status, which could jeopardize a stock's ability to produce MSY on a continuing basis.

Option 2: Change stock status in response to fishing mortality estimates either annually or on a multiyear basis; target reference points would not change without an assessment.

Option 2 would allow NMFS to make decisions on stock status based on fishing mortality estimates without the need for a stock assessment. If the fishing mortality exceeds the overall ACL annually or over multiple years, then NMFS could change the stock status of that species to "overfishing occurring." This option would not allow NMFS to change target reference points used to determine stock status.

Pros:

- Could allow the agency to be more responsive to changes in fishing mortality to prevent sustained ecological impacts.
- Would be a more timely way to adjust management than by using only stock assessments, which are infrequent and may not be timely enough to allow for management changes required by stock status shifts.
- More timely response to changes to stock status, which in turn could limit the negative impacts to stock.

Cons:

- Scientific uncertainty in mortality estimates may not be accounted for when determining changes in stock status based on static target reference points.

Option 3: Compare a 3-year average of total harvest to the OFL to determine overfishing status.

Option 3 would use a three-year average of total harvest compared to the OFL to determine overfishing status. Currently, many shark stocks are assessed infrequently, so overfishing determinations are made infrequently as well. For example, while sandbar sharks were assessed in 2011 and 2016 (5 years apart), Atlantic blacktip sharks were assessed in 2006 (in an assessment that could not determine status), and are only now being re-assessed (13 years apart). Some species have not been assessed at all, allowing for only an "unknown" status.

Pros:

- Could allow for overfishing determinations to be made on all stocks on an annual basis.
- This approach could capture the recent impacts of fishing on a stock and help smooth out retrospective bias from stock assessments.
- Could allow for timely overfishing determinations, as average catches can be compared to OFL on an annual basis.

Cons:

- May not reflect the biological conditions of the shark species and/or management groups as accurately as a stock assessment would.

Option 4: Use a method, such as a Percent Standard Error (PSE) meta-analysis, to account for variance in catch estimates (like the recreational sector), that compares the 3-year average catch to the OFL to determine overfishing status.

Option 4 is similar to Options 2 and 3 in that a stock assessment would not be needed to adjust overfishing status. However, under Option 4, rather than directly comparing harvest to the OFL, we could use a method such as the PSE meta-analysis to review all ACLs, accounting for variance in commercial discards, and recreational landings and dead discards to determine ABC and total landings for shark species and/or management groups. Any changes in overfishing status would mean this analysis determined the level of harvest relative to the OFL. This option accounts for the fact the commercial sector is quota limited, and fishermen send reports on a weekly basis. Therefore, landings are accounted for in the commercial fishery.

Pros:

- Could allow for overfishing determinations to be made on all stocks on an annual basis.
- This approach would add greater confidence on landings estimates in the recreational sector and discards in the commercial sector, with greater precision and reliability, so that management decisions are based on the best available science.
- This approach would minimize the influence of landings estimates with low precision, and minimize the uncertainty that they add to management decisions.

Cons:

- May not represent actual stock status due to using a meta-analysis to account for variability annually, which could hide status issues.
- May increase the probability of overfishing if the variance in catch is underestimated.

Option 5: Use a comparison of 3-year average catch to OFL when declaring overfishing has ended.

Similar to the other options in that a stock assessment would not be needed to adjust overfishing status. Option 5 uses a three-year average when declaring overfishing has ended. This would dampen the effects of outliers within the data and help provide a more consistent determination of when the capacity of the stock to produce MSY on a continuing basis has been reached.

Pros:

- Reduce the effects of outliers in data from causing a change in stock status when compared to other options.
- Multi-year overfishing status determination criteria could limit negative impacts to the stock while providing stability to the fishery, would be based on the best scientific information available, and would not impact the timeliness of agency response to overfishing. ACL and AM mechanisms are in place for all fisheries, and would continue to constrain fishing mortality on an annual basis.

Cons:

- Increased likelihood of impacting stock negatively, if the three year average masks overfishing (i.e., overfishing is declared one or two years late).
- Stock status changes will only occur if a three-year average shows a status change is warranted.

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