

DRAFT

FRAMEWORK ADJUSTMENT 6

**to the
Atlantic Herring Fishery Management Plan (FMP)**

AND

**Proposed Atlantic Herring Fishery Specifications
for the 2019-2021 Fishing Years
(January 1, 2019 – December 31, 2021)**



Including a
Draft Environmental Assessment (EA)

Prepared by the
New England Fishery Management Council
in cooperation with the
National Marine Fisheries Service

*Council approval of Draft EA: June 2019
Preliminary Submission of Draft EA: July 2019
Formal Submission of Draft EA: August 2019*

Commented [DB1]:
Committee Motions and Consensus Statements from March 28, 2019 meeting have been noted in the margin.

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NOAA Fisheries website with up-to-date information on U.S. seafood.

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LIST OF ACRONYMS

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
AM	Accountability Measure
ASMFC	Atlantic States Marine Fisheries Commission/Commission
EC	Ecosystem Component
EFH	Essential Fish Habitat
ESA	Endangered Species Act
DMF	Division of Marine Fisheries
FMP	Fishery Management Plan
IFM	Industry-Funded Monitoring
MAFMC	Mid-Atlantic Fishery Management Council
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NEAMAP	Northeast Area Monitoring and Assessment Program
NEFMC/Council	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Limit
PDT	Plan Development Team
RH/S	River Herring/Shad
RSA	Research Set-Aside
SARC	Stock Assessment Review Committee
SAS	Stock Assessment Subcommittee
SAW	Stock Assessment Workshop
SFMP	Sustainable Fishery Management Plan
SOF	Stocks in the Fishery
SSC	Scientific and Statistical Committee
TEWG	Technical Expert Working Group

1.0 INTRODUCTION AND BACKGROUND

1.1 PURPOSE AND NEED

The purpose of this action is to specify the overfishing limit (OFL) and acceptable biological catch (ABC) for the Atlantic herring fishery, and to set specifications for the 2019-2021 fishing years consistent with the best available science and the requirements of the Atlantic Herring FMP. This action is needed to prevent overfishing while providing additional flexibility and promoting the full utilization of optimum yield (OY). ~~The requirement to set multiyear specifications is also needed to prevent overfishing.~~

Pursuant to the requirements of the MSA, the specifications and RH/S catch caps are also needed intended to continue to address and minimize the catch and bycatch mortality of river herring and shad to the extent practicable. The associated purpose is to implement river herring/shad catch caps that are intended to meet the objectives specified in Framework 3 to the Atlantic Herring FMP:

- 1) Provide strong incentive for the industry to continue to avoid river herring/shad and reduce river herring/shad catch to the extent practicable;
- ~~2) Enhance coordination with the Mid-Atlantic Fishery Management Council to address overlapping fisheries; and~~
- 3) Promote flexibility to adjust the catch cap(s) in the future as more information becomes available.

Another need for this action is to make it consistent with the best available science in terms of the status of the Atlantic herring resource, with an overall purpose of updating the overfishing definition to be consistent the 2018 Atlantic herring benchmark assessment.

Commented [DB2]:

By consensus, the Committee recommends the Council use the draft Purpose and Need language provided in Framework 6 (Section 1.1).

By consensus, recommend to the Council that the purpose and need for RH/S catch caps be modified to strike the purpose: 2) enhance coordination with MAFMC to address overlapping fisheries.

Table 1. Purpose and Need for Framework 6 (2019-2021 fishery specifications)

Need	Purpose
To prevent overfishing while providing additional flexibility and promoting the full utilization of optimum yield (OY).	Specify OFL and ABC and set specifications for the 2019-2021 fishing years.
Continue to address and minimize the catch and bycatch mortality of river herring and shad to the extent practicable.	Implement RH/S catch caps that are intended to provide strong incentive for the industry to continue to avoid RH/S and reduce RH/S catch to the extent practicable and promote flexibility to adjust catch caps in the future as more information becomes available.
Update the overfishing definition to be consistent with the best available science regarding the status of the Atlantic herring resource.	Update the overfishing definition to be consistent with the 2018 Atlantic herring benchmark assessment.

1.2 GOALS AND OBJECTIVES

The 2019-2021 Atlantic herring fishery specifications are intended to meet the goal and several of the objectives of the Atlantic Herring FMP, as modified in Amendment 1:

Goal - Manage the Atlantic herring fishery at long-term sustainable levels consistent with the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act.

Objectives

- Harvest the Atlantic herring resource consistent with the definition of overfishing contained in the Herring FMP and prevent overfishing.
- Prevent the overfishing of discrete spawning components of Atlantic herring.
- Avoid patterns of fishing mortality by age which adversely affect the age structure of the stock.
- Provide for long-term, efficient, and full utilization of the optimum yield from the herring fishery while minimizing waste from discards in the fishery. Optimum yield is the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, taking into account the protection of marine ecosystems, including maintenance of a biomass that supports the ocean ecosystem, predator consumption of herring, and biologically sustainable human harvest. This includes recognition of the importance of Atlantic herring as one of many forage species of fish, marine mammals, and birds in the Northeast Region.
- Minimize, to the extent practicable, the race to fish for Atlantic herring in all management areas.
- Provide, to the extent practicable, controlled opportunities for fishermen and vessels in other mid-Atlantic and New England fisheries.
- Promote and support research, including cooperative research, to improve the collection of information in order to better understand herring population dynamics, biology and ecology, and to improve assessment procedures.
- Promote compatible U.S. and Canadian management of the shared stocks of herring.
- Continue to implement management measures in close coordination with other Federal and State FMPs and the Atlantic States Marine Fisheries Commission (ASMFC) management plan for Atlantic herring, and promote real-time management of the fishery.

1.3 ATLANTIC HERRING FISHERY SPECIFICATIONS – DEFINITIONS AND FORMULAS

The following definitions/formulas were adopted in the Atlantic Herring FMP (modified in Amendment 4) and are described below as they apply to the 2019-2021 Atlantic herring fishery specifications.

Overfishing Limit (OFL). The catch that results from applying the maximum fishing mortality threshold to a current or projected estimate of stock size. When the stock is not overfished and overfishing is not occurring, this is usually F_{MSY} or its proxy.

$$OFL \geq ABC \geq ACL$$

The proposed Atlantic herring OFL specification for 2019-2021 is derived from short-term projections that assume total herring catch in 2018 of 49,900 mt. These values were developed by the Herring PDT and reviewed by the SSC at their meeting in October 2018.

Acceptable Biological Catch (ABC). The maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. The MSA interpretation of ABC includes consideration of biological uncertainty (stock structure, stock mixing, other biological/ecological issues), and recommendations for ABC should come from the NEFMC SSC. ABC can equal but never exceed the OFL.

$$OFL - \text{Scientific Uncertainty} = ABC \text{ (Determined by SSC)}$$

The proposed Atlantic herring ABC specification for 2019-2021 is derived from short-term projections following the 2018 Atlantic herring update assessment and was recommended by the SSC at its October 2018 meeting (Appendix 1).

ABC Control Rule (ABC CR). The specified approach to setting the ABC for a stock or stock complex as a function of scientific uncertainty in the estimate of OFL and any other scientific uncertainty. The ABC control rule will consider uncertainty in factors such as stock assessment issues, retrospective patterns, predator-prey issues, and projection results. The ABC control rule will be specified and may be modified based on guidance from the SSC during the specifications process. Modifications to the ABC control rule can be implemented through specifications or framework adjustments to the Herring FMP (in addition to future amendments), as appropriate.

Current (interim) ABC Control Rule: Under the current ABC control rule, ABC will be specified for three years based on the annual catch that is projected to produce a probability of exceeding F_{MSY} in the third year that is less than or equal to 50%. For 2016-2018, this value is 110,000 mt.

The current ABC control rule is considered an interim control rule, i.e., a placeholder until the Council can develop a long-term control rule through a more comprehensive management action. The Council initiated Amendment 8 to the Atlantic Herring FMP in January 2015 to consider a range of alternatives to establish a long-term ABC CR for Atlantic herring, including alternatives that explicitly account for Atlantic herring's role in the ecosystem. The Council approved Amendment 8 in December 2018 including an ABC control rule. That action is currently under review and has not been implemented by NMFS yet. Therefore this action will include one alternative that is consistent with the Amendment 8 ABC control rule, and one alternative that is similar to the interim ABC control rule.

Annual Catch Limit (ACL). A stockwide ACL will be established that accounts for both scientific uncertainty (through the specification of ABC) and management uncertainty (through the specification of the stockwide ACL and buffer between ABC and the ACL).

The ACL is the annual catch level specified such that the risk of exceeding the ABC is consistent with the management program. The ACL can equal but never exceed the ABC. ACL should be set lower than the ABC as necessary due to uncertainty over the effectiveness of management measures. The stockwide Atlantic herring ACL equates to the U.S. optimum yield (OY) for the Atlantic herring fishery and serves as the level of catch that determines whether accountability measures (AMs) become effective. The AM for the stockwide ACL, total fishery closure at 95%, reduces the risk of overfishing.

$$\text{ABC} - \text{Management Uncertainty} = \text{Stockwide ACL} = \text{OY}$$

Sub-ACL. Area-based sub-divisions of the stockwide/total Atlantic herring ACL, intended to minimize the risk of overfishing any stock sub-component. The Council has chosen to apply AMs to the sub-ACLs (closure of the area at 92%), further reducing the risk of overfishing.

Accountability Measure(s) (AMs). Management measures established to ensure that (1) the ACL is not exceeded during the fishing year; and (2) any ACL overages, if they occur, are mitigated and corrected.

Domestic Annual Harvest (DAH). DAH is established based on the expected catch from U.S. fishing vessels during the upcoming fishing year(s). The Herring FMP, as modified in Amendment 4, specifies that OY may equal DAH.

$$\text{OY} \geq \text{DAH}$$

The Herring FMP, as modified in Amendment 4, also specifies that domestic annual harvest (DAH) will be composed of domestic annual processing (DAP) and the amount of Atlantic herring that can be taken in U.S. waters and transferred to Canadian herring carriers for transshipment to Canada (BT).

$$\text{DAH} = \text{DAP} + \text{BT}$$

Domestic Annual Processing (DAP). The amount of U.S. harvest that domestic processors will use, combined with the amount of the resource that will be sold as fresh fish (including bait). The Herring FMP specifies that DAP is a subset of DAH and is composed of estimates of production from U.S. shoreside and at-sea processors. The Herring FMP authorizes the allocation of a portion of DAP for at-sea processing by domestic processing vessels that exceed the current size limits (U.S. at-sea processing, USAP).

U.S. At-Sea Processing (USAP). Domestic at-sea processing capacity by U.S. vessels that exceed current size limits. When determining the USAP allocation, the Council should consider the availability of other processing capacity, development of the fishery, status of the resource,

and opportunities for vessels to enter the herring fishery. This has been set at 0 mt in recent specification packages.

Border Transfer (BT). The amount of herring that can be taken in U.S. waters and transferred to Canadian herring carriers for transshipment to Canada, (4,000 mt for 2016-2018 and previous specifications, 2018 and 2019 in-season adjustments set it at ???).

Research Set-Aside (RSA). RSAs are allowed in any or all of the herring management areas with a sub-ACL of 0-3%.

Fixed Gear Set-Aside (FGSA). FGSA can be specified up to 500 mt in Area 1A and will be returned to the 1A sub-ACL if not utilized by November 1.

1.4 BACKGROUND (*THIS SECTION HAS NOT BEEN DRAFTED YET*)

- Paragraph about 2018 assessment
- Paragraph about Amendment 8 and timing
- Paragraph about 2018 and 2019 in-season adjustments
- Paragraph about change in assessment schedule for foreseeable future – next one scheduled for spring 2020, so the specs for 2021 in this action will likely be replaced by subsequent action (specs for 2021-2023).
- Reference NMFS letter about approaching overfished and requirements to rebuild overfished fisheries: Section 104-297

(e) **REBUILDING OVERFISHED FISHERIES.--**

(1) The Secretary shall report annually to the Congress and the Councils on the status of fisheries within each Council's geographical area of authority and identify those fisheries that are overfished or are approaching a condition of being overfished. For those fisheries managed under a fishery management plan or international agreement, the status shall be determined using the criteria for overfishing specified in such plan or agreement. A fishery shall be classified as approaching a condition of being overfished if, based on trends in fishing effort, fishery resource size, and other appropriate factors, the Secretary estimates that the fishery will become overfished within two years.

(2) If the Secretary determines at any time that a fishery is overfished, the Secretary shall immediately notify the appropriate Council and request that action be taken to end overfishing in the fishery and to implement conservation and management measures to rebuild affected stocks of fish. The Secretary shall publish each notice under this paragraph in the Federal Register.

(3) Within 2 years after an identification under paragraph (1) or notification under paragraphs (2) or (7), the appropriate Council (or the Secretary, for fisheries under section 302(a)(3)) shall prepare and implement a fishery management plan, plan amendment, or proposed regulations for the fishery to which the identification or notice applies--

(A) to end overfishing immediately in the fishery and to rebuild affected stocks of fish; or

(B) to prevent overfishing from occurring in the fishery whenever such fishery is identified as approaching an overfished condition.

(4) For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations prepared pursuant to paragraph (3) or paragraph (5) for such fishery shall--

(A) specify a time period for rebuilding the fishery that shall--

(i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem; and

- (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise;
 - (B) allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery; and
 - (C) for fisheries managed under an international agreement, reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.
- (5) If, within the 2-year period beginning on the date of identification or notification that a fishery is overfished, the Council does not submit to the Secretary a fishery management plan, plan amendment, or proposed regulations required by paragraph (3)(A), the Secretary shall prepare a fishery management plan or plan amendment and any accompanying regulations to stop overfishing and rebuild affected stocks of fish within 9 months under subsection (c).
- (6) During the development of a fishery management plan, a plan amendment, or proposed regulations required by this subsection, the Council may request the Secretary to implement interim measures to reduce overfishing under section 305(c) until such measures can be replaced by such plan, amendment, or regulations. Such measures, if otherwise in compliance with the provisions of this Act, may be implemented even though they are not sufficient by themselves to stop overfishing of a fishery.
- (7) The Secretary shall review any fishery management plan, plan amendment, or regulations required by this subsection at routine intervals that may not exceed two years. If the Secretary finds as a result of the review that such plan, amendment, or regulations have not resulted in adequate progress toward ending overfishing and rebuilding affected fish stocks, the Secretary shall--
- (A) in the case of a fishery to which section 302(a)(3) applies, immediately make revisions necessary to achieve adequate progress; or
 - (B) for all other fisheries, immediately notify the appropriate Council. Such notification shall recommend further conservation and management measures which the Council should consider under paragraph (3) to achieve adequate progress.

2.0 MANAGEMENT ALTERNATIVES THAT COULD BE CONSIDERED

2.1 **ALTERNATIVES FOR UPDATING OVERFISHING DEFINITION**

2.1.1 No Action (Alternative 1)

The current overfishing definition in the Herring FMP is below.

If stock biomass is equal or greater than B_{MSY} , overfishing occurs when fishing mortality exceeds F_{MSY} . If stock biomass is below B_{MSY} , overfishing occurs when fishing mortality exceeds the level that has a 50 percent probability to rebuild stock biomass to B_{MSY} in 5 years ($F_{Threshold}$). The stock is in an overfished condition when stock biomass is below $\frac{1}{2} B_{MSY}$ and overfishing occurs when fishing mortality exceeds $F_{Threshold}$. These reference points are thresholds and form the basis for the control rule.

The control rule also specifies risk-averse fishing mortality targets, accounting for the uncertainty in the estimate of F_{MSY} . If stock biomass is equal to or greater than $\frac{1}{2} B_{MSY}$, the target fishing mortality will be the lower level of the 80 percent confidence interval about F_{MSY} . When biomass is below B_{MSY} , the target fishing mortality will be reduced consistent with the five-year rebuilding schedule used to determine $F_{Threshold}$.

Commented [DB3]:
By consensus, the Committee recommends the Council include the two alternatives drafted for overfishing definition (Section 2.1).

2.1.2 Updated overfishing definition (Alternative 2)

This alternative would update the overfishing definition to clarify some of the text but more importantly to be more consistent with the 2018 stock assessment. Reference points produced in the 2018 stock assessment no longer rely on a poorly estimated stock-recruit relationship; the stock-recruit relationship further deteriorated in the 2018 assessment. Therefore, the reference points are not estimated based on a proxy of $F_{40\%}$. Since the 2018 assessment was not able to estimate B_{msy} or F_{msy} , proxies were developed instead. Also, the 2018 assessment reports biomass in term of spawning stock biomass (SSB), not biomass (B), as was previously reported and used in the current overfishing definition. Spawning stock biomass is a type of biomass, it is total biomass * maturity. The only difference between SSB and B is the maturity scalar.

Finally, since this alternative is updating the overfishing definition, one item that could be clarified is the term “about” in reference to the confidence interval “about” F_{msy} . New text for the overfishing definition are underlined below to show how this alternative compares to No Action.

If stock biomass is equal or greater than SSB_{MSY} or SSB_{MSY} proxy, overfishing occurs when fishing mortality exceeds F_{MSY} or F_{MSY} proxy. If stock biomass is below SSB_{MSY} or SSB_{MSY} proxy, overfishing occurs when fishing mortality exceeds the level that has a 50 percent probability to rebuild stock biomass to SSB_{MSY} in 5 years ($F_{Threshold}$). The stock is in an overfished condition when stock biomass is below $\frac{1}{2}$ SSB_{MSY} and overfishing occurs when fishing mortality exceeds $F_{Threshold}$. These reference points are thresholds and form the basis for the control rule.

The control rule also specifies risk-averse fishing mortality targets, accounting for the uncertainty in the estimate of F_{MSY} or F_{MSY} proxy. If stock biomass is equal to or greater than $\frac{1}{2}$ SSB_{MSY} or SSB_{MSY} proxy, the target fishing mortality will be the lower ~~value level~~ of the 80 percent confidence interval ~~around about~~ F_{MSY} or F_{MSY} proxy. When biomass is below SSB_{MSY} or SSB_{MSY} proxy, the target fishing mortality will be reduced consistent with the five-year rebuilding schedule used to determine $F_{Threshold}$.

2.2 ALTERNATIVES FOR 2019-2021 ATLANTIC HERRING FISHERY SPECIFICATIONS

2.2.1 Overfishing Limit (OFL) and Acceptable Biological Catch (ABC)

Following the 2018 Atlantic herring benchmark assessment meeting, the SSC met in October 2018 to review the assessment results and develop recommendations for the Atlantic herring overfishing limit (OFL) and acceptable biological catch (ABC) specifications for the 2019-2021 fishing years. The final SSC report is included as Appendix I.

The SSC reviewed ABC recommendations made by the PDT that were based on the Council-selected ABC control rule adopted in Amendment 8, which was informed by the MSE process. The control rule is biomass based, with a maximum fishing mortality of 0.8 when biomass is greater than 0.5. When biomass falls below 50% SSB/SSB_{msy}, fishing mortality declines linearly

until 0.1, when fishing mortality is set to zero, or a fishery cutoff at 0.1. The ABC control rule was applied to projected biomass estimates for 2019-2021.

The SSC was prepared to implement the harvest control rule selected through the Amendment 8 MSE process. However, the SSC had reservations about the projections for Atlantic herring and were concerned about the assumptions regarding future recruitment. The SSC was concerned that age 1 recruitment in projections for 2019-2021 was drawn from 1965-2015 and the resulting projected biomass which showed a substantial increase over time. The SSC did not have confidence in the projected increase in biomass in 2021 and were concerned about setting ABC based on this value. Following an extensive discussion on this topic, the SSC resolved to make ABC recommendations for 2019 and 2020 based on the ABC control rule but recommended keeping ABC in 2021 the same as 2020 due to the uncertainty in the projections. The SSC recommended the NEFMC request an update assessment in 2020 based on the existing benchmark assessment. The objective of this update will be to verify projected trend in biomass and recruitment with the aim of revising advice for 2021 based on more informed estimates of recent recruitment.

Table 2 – SSC recommendations for OFL and ABC for 2019-2021 fishing years (mt)

Year	OFL	ABC
2019	30,668	21,266
2020	38,878	16,131
2021	59,788	16,131

The PDT has prepared updated 2019-2021 projections for consideration (See PDT Memo, Document #5).

2.2.1.1 No Action OFL/ABC (Alternative 1)

No Action (Alternative 1) would maintain the 2019 Atlantic herring fishery specifications that were implemented by the 2019 in-season adjustment for the 2019-2021 fishing years (Table 3). Specification of Atlantic herring ABC would be 21,266 mt for all three fishing years, which is higher than the SSC recommendation for 2020 and 2021 (Table 2).

Table 3 - Alternative 1 (No Action) for 2019-2021 OFL and ABC (mt)

	No Action OFL/ABC Alternative 2019-2021 (metric tons)
OFL	30,668
ABC	21,266

2.2.1.2 OFL and ABC consistent with ABC control rule proposed in Amendment 8 (Alternative 2)

Alternative 2 would implement the OFL and ABC consistent with the ABC control rule adopted by the Council in Amendment 8 (Table 4). Amendment 8 has not been approved by NMFS yet, but the proposed rule is scheduled to be published around the time the Council takes final action on this specification package. The ABC control rule adopted by the Council in Amendment 8 is the rule used to specify the OFL/ABC values reviewed and approved by the SSC for 2019-2021. Specifically, when biomass is greater than 50% of SSB/SSB_{MSY}, the maximum fishing mortality allowed is 80% of F_{MSY}, so 20% of F_{MSY} is left for herring predators. Under this policy as biomass declines, fishing mortality declines linearly, and if biomass falls below 10% of SSB/SSB_{MSY}, then ABC is set to zero, no fishery allocation (Figure 1). Amendment 8 also proposes that ABC should be set for three years but with annual application of the control rule. This allows ABC to vary between years within a three-year period, the ABC may not be constant if biomass is projected to change during a specification timeframe.

Commented [DB4]:
 Cmte Motion #1:
 Recommend the Council include Alternative 2 (original) for setting OFL/ABC in Framework 6 (Section 2.2.1).
 Vote: 11/0/0, carries

Cmte Motion #3
 Recommend the Council include for consideration Alternative 2 (updated), Table 3 in the PDT memo, as it reflects the most accurate catch data for 2018.
 Vote: 12/0/0, carried

SEE PDT MEMO – DOCUMENT #5 for an explanation of Alternative 2 (original) compared to Alternative 2 (updated)

Figure 1. ABC control rule proposed in Amendment 8, as adopted by the Council in September 2018.

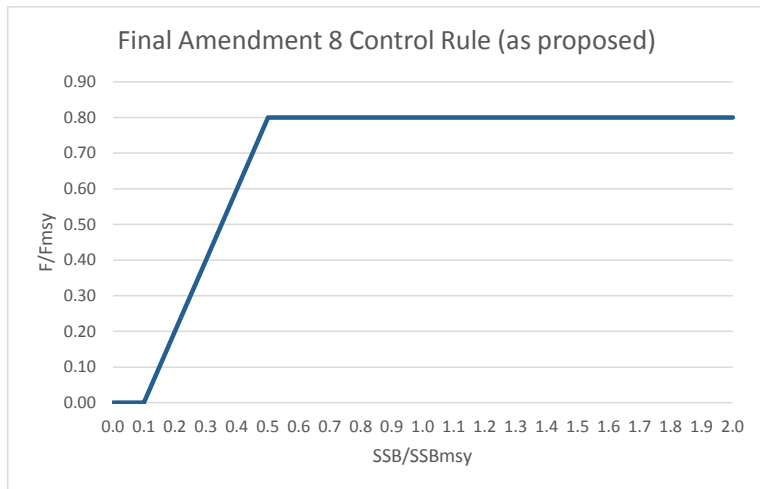


Table 4 – OFL/ABC Alternative 2 for 2019-2021 Atlantic herring specifications (mt)

	Alternative 2 2019 (metric tons)	Alternative 2 2020 (metric tons)	Alternative 2 2021 (metric tons)
OFL	30,668	38,878	59,788
ABC	21,266	16,131	16,131

2.2.1.3 OFL and ABC similar to interim ABC control rule used in 2016-2018 specifications (Alternative 3)

Alternative 3 would implement an OFL and ABC consistent with the interim ABC control rule in the event the ABC control rule adopted by the Council in Amendment 8 is not approved by NMFS and it is determined that this action needs an additional alternative (Table 5). The interim ABC control rule uses a constant catch approach, with the annual ABC set such that the probability of overfishing does not exceed 50% in any of those years (but may reach 50% in the third year if biomass is estimated to decrease, or may reach 50% in the first year if biomass is estimated to increase).

For this alternative the OFL and ABC for 2019 were set equal to the values implemented already by the 2019 in-season adjustment and the OFL and ABC for 2020 and 2021 are set such that the probability of overfishing does not exceed 50% in either year. Note that these OFL and ABC values are higher than the SSC recommendations, which applied the Amendment 8 control rule (Table 2).

Table 5 – OFL/ABC Alternative 3 for 2019-2021 Atlantic herring specifications (mt)

	Alternative 3 2019 Specifications (metric tons)	Alternative 3 2020 Specifications (metric tons)	Alternative 3 2021 Specifications (metric tons)
OFL	30,668		
ABC	21,266		

Commented [DB5]:
 Cmte Motion #2
 Recommend the Council include Alternative 1 and Alternative 3 for OFL and ABC only as outlined in Table 5 in the draft Framework 6 document.
 Vote: 9:0:2, carries

2.2.2 Management Uncertainty and Annual Catch Limit (ACL)

The difference between the Atlantic herring acceptable biological catch (ABC) and the stockwide annual catch limit (ACL) equates to what the Council specifies as management uncertainty. The management uncertainty specification further ensures that Atlantic herring catch will not exceed the ABC in a given year by buffering against uncertainty related to the management system. The deduction for management uncertainty occurs based on the SSC recommendation for ABC to derive a stockwide ACL, which is the U.S. Atlantic herring optimum yield (OY).

During the previous specifications process, the Council considered a range of deductions for management uncertainty based on three possible factors:

1. Canadian catch of Atlantic Herring (New Brunswick (NB) Weir Fishery);
2. Uncertainty around estimates of state waters Atlantic herring catch; and
3. Uncertainty around estimates of Atlantic herring discards.

The potential sources of management uncertainty were reviewed for this package, and it was determined that the same three sources likely encompass the vast majority of any management uncertainty in this fishery.

2.2.2.1 Background

Canadian catch of Atlantic herring (New Brunswick weir fishery)

Catch of the Atlantic herring stock complex in Canadian waters consists primarily of fish caught in the New Brunswick (NB) weir fishery. During the benchmark stock assessment for Atlantic herring (2012), the SARC 54 Panel noted that the contribution of the Atlantic herring stock on the Scotian Shelf region is unknown. It is generally assumed that juvenile fish (age 1 and 2) caught in the NB weir fishery are from the inshore (GOM) component of the Atlantic herring stock complex, while adult fish (age 3+) caught in the NB weir fishery are from the SW Nova Scotia stock complex (4WX).

NB weir fishery catch is not tracked in-season against the U.S. Atlantic herring ACL. Rather, the annual expected catch in the NB weir fishery is estimated and then subtracted from the ABC, as an element of the management uncertainty buffer, to calculate the stockwide Atlantic herring ACL, which is OY for the U.S. fishery.

The overall trend in Canadian herring landings since 1990 has been downward (Table 6) but catches are variable over time; total catch dropped below 1,000 mt in 2013 and 2015 but was above 30,000 in 2007. The number of weirs has declined from almost 50 in 2013 to just over 10 in 2017. The most recent five-year average of NB weir landings (2013-2017) is about 5,000 mt, and even lower for the last 3 years (2015-2017), about 1,500 mt.

There was a dramatic increase in landings from shut offs in New Brunswick in 2018. Shut offs operate in the same areas, target the same schools of herring but they are mobile and can move from cove to cove (Personal communication, Rabindra Singh DFO). In most years they make up a small fraction of total landings, but in 2018 it seems to have exceeded weir landings.

The fishery occurs primarily during the late summer and autumn (June-October), with highest landings in July and August (Table 7); however, dependent on many factors including weather, fish migration patterns, and environmental conditions. Catch from this fishery after October has averaged under 4% of the yearly total.

Table 6 - Number of active weirs and the catch per weir in the New Brunswick, Canada fishery, 1978-2017

Year	NB Weir Catch (mt)	No. Active Weirs	Catch Per Weir (mt)
1978	33,570	208	162
1979	32,477	210	155
1980	11,100	120	92
1981	15,575	147	102
1982	22,183	159	140
1983	10,594	143	88
1984	8,374	116	72
1985	26,724	156	171
1986	27,515	105	262
1987	26,622	123	216
1988	32,554	191	200
1989	43,475	171	255
1990	38,224	154	258
1991	23,713	143	166
1992	31,899	151	212
1993	31,431	145	216
1994	20,622	129	160
1995	18,198	106	172
1996	15,781	101	156
1997	20,416	102	200
1998	19,113	108	181
1999	18,234	100	191
2000	16,472	77	213
2001	20,064	101	199
2002	11,807	83	142
2003	9,003	78	115
2004	20,620	84	245
2005	12,639	76	166
2006	11,641	89	131
2007	30,145	97	311
2008	6,041	76	79
2009	3,603	38	95
2010	10,671	77	139
2011	2,643	37	71
2012	494	4	124
2013	5,902	49	120
2014	1,571	26	60
2015	146	11	13
2016	2,777	26	107
2017	1732	11	157
Long-Term Average	17,409	103	158
3-Year Average	1,552	16	92
5-Year Average	4,923	38	102
10-Year Average	4,545	40	101

Source: Department of Fisheries and Oceans Canada.

Table 7 - Monthly weir landings (mt) for weirs in New Brunswick, 1978-2018 (2018 is preliminary – need to update)

YEAR	MONTH												Year Total
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1978	3	0	0	0	512	802	5,499	10,275	10,877	4,972	528	132	33,599
1979	535	96	0	0	25	1,120	7,321	9,846	4,939	5,985	2,638	74	32,579
1980	0	0	0	0	36	119	1,755	5,572	2,352	1,016	216	0	11,066
1981	0	0	0	0	70	199	4,431	3,911	2,044	2,435	1,686	192	14,968
1982	0	17	0	0	132	30	2,871	7,311	7,681	3,204	849	87	22,181
1983	0	0	0	0	65	29	299	2,474	5,382	3,945	375	0	12,568
1984	0	0	0	0	6	3	230	2,344	2,581	3,045	145	0	8,353
1985	0	0	0	0	22	89	4,217	8,450	6,910	4,814	2,078	138	26,718
1986	43	0	0	0	17	0	2,480	10,114	5,997	6,233	2,564	67	27,516
1987	39	21	6	12	10	168	2,575	10,893	6,711	5,362	703	122	26,621
1988	0	12	1	90	657	287	5,993	11,975	8,375	8,457	2,343	43	38,235
1989	0	24		95	37	385	8,315	15,093	10,156	7,258	2,158	0	43,520
1990	0	0	0	0	93	20	4,915	14,664	12,207	7,741	168	0	39,808
1991	0	0	0	0	57	180	4,649	10,319	6,392	2,028	93	0	23,717
1992	0	0	0	15	50	774	5,477	10,989	9,597	4,395	684	0	31,981
1993	0	0	0	0	14	168	5,561	14,085	8,614	2,406	470	10	31,328
1994	0	0	0	18	0	55	4,529	10,592	3,805	1,589	30	0	20,618
1995	0	0	0	0	15	244	4,517	8,590	3,956	896	10	0	18,228
1996	0	0	0	0	19	676	4,819	7,767	1,917	518	65	0	15,781
1997	0	0	0	8	153	1,017	6,506	7,396	5,316	0	0	0	20,396
1998	0	0	0	0	560	713	3,832	8,295	5,604	525	0	0	19,529
1999	0	0	0	0	690	805	5,155	9,895	2,469	48	0	0	19,063
2000	0	0	0	0	10	7	2,105	7,533	4,940	1,713	69	0	16,376
2001	0	0	0	0	35	478	3,931	8,627	5,514	1,479	0	0	20,064
2002	0	0	0	0	84	20	1,099	6,446	2,878	1,260	20	0	11,807
2003	0	0	0	0	257	250	1,423	3,554	3,166	344	10	0	9,003
2004	0	0	0	0	21	336	2,694	8,354	8,298	913	3	0	20,620
2005	0	0	0	0	0	213	802	7,145	3,729	740	11	0	12,639
2006	0	0	0	0	8	43	1,112	3,731	3,832	2,328	125	462	11,641
2007	182	0	20	30	84	633	3,241	11,363	7,637	6,567	314	73	30,145
2008	0	0	0	0	0	81	1,502	2,479	1,507	389	49	32	6,041
2009	0	0	0	0	5	239	699	1,111	1,219	330	0	0	3,603
2010	0	0	0	6	64	1,912	2,560	3,903	1,933	247	46	0	10,671
2011	0	0	0	0	0	250	656	1,097	500	140	0	0	2,643
2012	0	0	0	0	29	140	5	5	98	217	0	0	494
2013	0	0	0	0	7	612	1,517	1,797	1,051	919	0	0	5,902
2014	0	0	0	0	0	70	130	147	449	774	0	0	1,571
2015	0	0	0	0	12	32	28	36	5	33	0	0	146
2016	0	0	0	0	3	0	102	1,034	1,153	485	0	0	2,777
2017	0	0	0	0	0	0	35	220	1,478	0	0	0	1,732
2018	0	0	0	0	0	166	2,129	1,798	767	506	15	0	5,382
NB Average Catch (t)	20	4	1	7	94	326	2,969	6,615	4,489	2,348	450	35	17,357
NB Minimum Catch (t)	0	0	0	0	0	0	5	5	5	0	0	0	146
NB Maximum Catch (t)	535	96	20	95	690	1,912	8,315	15,093	12,207	8,457	2,638	462	43,520

1. These data do not include the landings reported as shut off or beach seine.
2. The 2018 data are preliminary.

The PDT more recently calculated possible deductions from the ABC to account for management uncertainty based on updated (most recent) 3-year, 5-year, and 10-year average catch totals from the NB weir fishery (Table 8). These are the same options considered in the previous specifications package for 2016-2018.

Table 8 – Canadian weir and shut-off landings from 2009-2018 (preliminary) with possible deductions for management uncertainty based on 3-year, 5-year and 10-year averages.

Year	Canadian Landings (mt)
2009	4,031
2010	10,958
2011	3,711
2012	504
2013	6,431
2014	2,149
2015	146
2016	4,060
2017	2,103
2018	11,502*
3-year (2016-2018)	5,888
5-year (2014-2018)	3,992
10-year (2009-2018)	4,560
Buffer used in 2016-2018	6,200
Buffer used in 2019	6,200

* Preliminary

State water catch

The vast majority of the Atlantic herring resource is harvested in Federal waters. Catch by Federal permit holders that occurs in State waters is reported and counted against the sub-ACLs. Catch by state-only permit holders is monitored by the ASMFC and is not large enough to substantially affect management of the Federal fishery and the ability to remain under the sub-ACLs. Total Atlantic herring catch by vessels fishing in state waters was about 41,000 pounds in 2015. (PDT will update these estimates through 2017 or 2018).

The non-federally permitted commercial landings of Atlantic herring are by fishermen from Maine, primarily using fixed gear and a small number of seines. Table 12 provides updated catch estimates from the fixed gear fishery through 2013. The Council specifies a set-aside for West of Cutler fixed gear fishermen (FGSA), currently 295 mt (was 39 mt in 2019 action). The unused portion of the FGSA is returned to the Area 1A fishery after November 1. The ASMFC's

requirement that fixed gear fishermen must report through IVR (and therefore have catch counted against the sub-ACL) has reduced any management uncertainty associated with State waters landings to an unsubstantial amount.

Table 9 - Atlantic herring landings from fixed gear fishery, before and after November 1 rollover date

Year	Sub-ACL Closure Date	Area 1A Sub-ACL (mt)	Cumulative Catch (mt) by Dec 31	Fixed Gear Landings (mt)	
				Jan-Oct	Nov-Dec
2004	11/19/2004	60,000	60,071	49	0
2005	12/2/2005	60,000	61,570	53	0
2006	10/21/2006	50,000	59,980	528	0
2007	10/25/2007	50,000	49,992	392	0
2008	11/14/2008	43,650	42,257	24	0
2009	11/26/2009	43,650	44,088	81	0
2010	11/17/2010	26,546	27,741	823	0
2011	10/27/2011	29,251	29,359	23	0
2012	11/5/2012	27,668	25,057	0	0
2013	10/15/2013	29,775	29,820	C	C
2014	10/26/2014	33,031	33,428	C	C

Source: ASMFC.
Note: "C" denotes that the value cannot be reported due to confidentiality.

Atlantic herring discards

The 2012 benchmark assessment for Atlantic herring incorporated Atlantic herring discards from the VTR data provided to them by NMFS. Discard estimates have only been available since 1996 and are generally less than 1% of the landings and do not represent a substantial source of mortality. However, this is not considered problematic to the Atlantic herring stock assessment, according to SAW 54 (NEFSC 2012). (PDT will update from 2018 assessment as well as updated observer data for below).

Atlantic herring discards are estimated by NMFS using vessel and observer data and are counted against the management area sub-ACLs. To date, uncertainty related to estimating Atlantic herring discards has not been a substantial source of management uncertainty. There does not appear to be a need to change this conclusion when considering management uncertainty for the 2016-2018 Atlantic herring fishery specifications. This is because increased sampling has improved bycatch accounting and reduced uncertainty associated with estimating Atlantic herring discards in recent years. In 2010, the Northeast Fisheries Observer Program (NEFOP) revised the training curriculum for observers deployed on herring vessels to focus on effectively sampling in high-volume fisheries. NEFOP also developed a discard log to collect detailed information on discards in the herring fishery, such as why catch was discarded, the estimated amount of discarded catch, and the estimated composition of discarded catch. Moreover, management measures implemented through Amendment 5 (NEFMC 2012) and other future

actions will continue to improve catch monitoring and the accuracy of herring discard estimates in future years.

Table 10 provides Atlantic herring discard estimates for 2010-2013 based on three sources of data: VMS, VTR, and observer data expansion. VMS discards were summed together by year using the Greater Atlantic Regional Fisheries Office (GARFO) Atlantic herring VMS catch report database. The VTR discards were summed together by year using the GARFO VTR databases. Lastly, the observer extrapolated data were acquired from the 2010-2013 year-end summary reports. Catch reporting through VMS was not required until 2011, so no discard estimates from VMS catch reports can be generated for 2010. With the exception of 2013, Atlantic herring discard reports from NMFS and VTRs are generally similar; discard estimates extrapolated from observer data tend to be more variable and have decreased in more recent years. Overall, regardless of data source, Atlantic herring discards represent a very small fraction of total catch. Total Atlantic herring catch in 2013 was 95,764 mt, so discards represented 0.01% - 0.2% of the total 2013 Atlantic herring catch. Given recent actions to enhance catch monitoring and reporting, there is no indication that the uncertainty regarding the Atlantic herring discard estimation is expected to increase during the upcoming fishery specifications cycle (2016-2018).

Table 10 - Atlantic herring discards (mt) by reporting method, 2010-2013

Year	VMS*	VTR**	Observer – Fleet Expansion***
2010	N/A	263	137
2011	179	179	210
2012	144	154	87
2013	113	169	18

Source: VMS, VTR databases and herring year end reports as of 8/28/2015.
 *GARFO herring VMS catch report table fso_admin.vms_herring_catch_report_stg.
 **GARFO VTR databases under the NOAA schema.
 ***Year-End discard calculation using observer data extrapolated out to the herring fleet.

2.2.2.2 Management uncertainty options

2.2.2.2.1 3-year moving average (2016-2018) (Option 1)

2.2.2.2.2 5-year moving average (2014-2018) (Option 2)

2.2.2.2.3 10-year moving average (2009-2018) (Option 3)

The PDT will develop what the specific rollback trigger would be for each option. The current provision that allows NMFS to rollback or allocate an additional 1,000 mt to the stockwide ACL and Area 1A sub-ACL would remain in place. If NMFS determines that the New Brunswick weir fishery lands less than the appropriate trigger for each option through October 1, NMFS will add 1,000 mt through a Federal Register notice (See Section 648.20 (h) for details)

Commented [DB6]:
 Cmte Motion #8
 Recommend the Council include three separate options for management uncertainty in this specification package: 3-year, 5-year, and 10-year averages. One-thousand metric tons would still rollback and be added to the ACL on October 1 if the New Brunswick weir fishery has not landed more than the trigger value (in mt) by that date.

The trigger values (in mt) associated with each of the management uncertainty buffer options would be reduced proportionally less than the current trigger of 4,000 mt. The Committee recommends the new trigger values be proportionally similar to the ratio of 6,200 mt to 4,000 mt (ratio of the management uncertainty buffer to the trigger value for a rollback).
 Vote: 11/0/1, carries

2.2.3 Border Transfer and US At-Sea Processing

The Council did not consider a range of alternatives for these specifications, thus, they are considered to maintain the status quo. However, some are formulaic, stemming from the specification of ACL.

DAH Specification

The Atlantic Herring FMP specifies that domestic annual harvest (DAH) is set less than or equal to OY Domestic annual harvest (DAH) is established based on the expected catch from U.S. fishing vessels during the upcoming fishing year and equals OY for the U.S. fishery.

$$\text{Stockwide ACL} = \text{OY} \leq \text{DAH}$$

The Herring FMP, as modified by Amendment 4, also specifies that domestic annual harvest (DAH) will be composed of domestic annual processing (DAP) and the amount of Atlantic herring that can be taken in U.S. waters and transferred to Canadian herring carriers for transshipment to Canada (BT).

$$\text{DAH} = \text{DAP} + \text{BT}$$

When specifying DAH for the Atlantic herring fishery, important considerations relate to the actual and potential capacity of the U.S. harvesting fleet. Recent fishery performance (landings) is also an important factor in this fishery. The Herring FMP became effective during the 2001 fishing year, and since 2001, total landings in the U.S. fishery have decreased. Table ??? summarizes total Atlantic herring catch as a percentage of the total available catch in each year from 2003-2018 (preliminary). Atlantic herring catch has been somewhat consistent over the time period (and in previous years), averaging about 91,925 mt from 2003-2014, with the highest catch of the time series observed in 2009 (103,943 mt) and lowest in ??? (??? mt). However, the quota allocated to the fishery (stockwide ACL/OY) has decreased 50% over the twelve-year period from 2003-2014. Allocations and landings increased after 2014 for several years, but more recently both have decreased dramatically. Allocations and landings have decreased....

In prior years when considering the DAH specification, the Council has evaluated the harvesting capacity of the directed Atlantic herring fleet and determined that the herring fleet is capable of fully utilizing the available yield from the fishery. Therefore, the **DAH specification for the 2019-2021 fishing years would remain equal to the stockwide Atlantic herring ACL**, i.e., the U.S. OY specified by the Council for each of the 2019-2021 fishing years.

DAP Specification

Domestic Annual Processing (DAP) is defined in the Herring FMP as the amount of U.S. harvest that domestic processors will use, combined with the amount of the resource that will be sold as fresh fish (including bait). DAP was set equal DAH minus 4,000 mt (???) for BT during the 2019-2021 fishing years and in prior specifications.

Processing, with respect to the Atlantic herring fishery, is defined in the regulations as *the preparation of Atlantic herring to render it suitable for human consumption, bait, commercial uses, industrial uses, or long-term storage, including but not limited to cooking, canning, roe extraction, smoking, salting, drying, freezing, or rendering into meat or oil*. The definition of processing does not include trucking and/or transporting fish.

While it is difficult to predict whether or not the U.S. processing sector will utilize all of the available DAP in 2019-2021, it is certainly possible given the capacity of the domestic processing sector. Therefore, the **DAP specification for the 2019-2021 fishing years would remain equal to the DAH specification minus the BT specification.**

BT Specification

The Border Transfer specification is U.S.-caught herring transshipped to Canada via Canadian carrier vessels and used for human consumption. This specification is not a set-aside; rather, it is a maximum amount of Atlantic herring caught from Area 1A that can be transshipped to Canadian vessels for human consumption. GARFO tracks BT utilization through a separate dealer code. Specification of BT has remained at 4,000 mt since the implementation of the Atlantic Herring FMP, and there was no change for the last specification package (2016-2018 fishing years). However, in the 2019 in-season adjustment BT was set to zero in light of the large quota reductions implemented by that action. The Council recommended leaving as much herring in the US for bait as possible. Several Canadian vessels did apply for permits to transship US caught herring to be carried to Canadian processing facilities for human consumption, but there ultimately was no activity.

Table 11 indicates a decrease in BT from 1994-2013, with 2011 utilizing 838 mt (21% of 4,000 border transfer mt). No BT was utilized from 2008-2010, but some amount was utilized in 2011-2013. Information about BT utilization in 2014 is not available at this time.

Table 11 - Use of border transfer (mt) (will update with more recent years). Source: NMFS

Year	MT Utilized in BT
1994	2,456
1995	2,117
1996	3,690
1997	1,280
1998	1,093
1999	839
2000	1,546
2001	445
2002	688
2003	1,311
2004	184
2005	169
2006	653
2007	53
2008	0
2009	0
2010	0
2011	946
2012	788
2013	838

Commented [DB7]:
 Motion #4
 Recommend the Council not include alternatives for border transfer in this specification package, and set it at 0mt for FY2019-2021.

 4a. Substitute motion:
 Recommend the Council set border transfer at 250mt for this specifications package.
 Vote: 7:6:0, carries

 Main motion: 7:6:0, carries

USAP Specification

The Atlantic Herring FMP states that “part of DAP may be allocated for at-sea processing by domestic vessels that exceed the vessel size limits (Herring FMP Section 3.6.6). This allocation will be called the ‘U.S. at-sea processing’ (USAP) allocation. The term ‘at-sea processing’ refers to processing activities that occur in the Exclusive Economic Zone outside State waters. When determining this specification, the Council will consider the availability of other processing capacity, development of the fishery, status of the resource, and opportunities for vessels to enter the herring fishery.” The USAP specification serves as a cap for USAP activities and is not a specific allocation to this processing sector.

During the 2007-2009 fishing years, the Council maintained a USAP specification of 20,000 mt (Areas 2/3 only) based on information received about a new at-sea processing vessel that intended to utilize a substantial amount of the USAP specification. At that time, landings from Areas 2 and 3 – where USAP is authorized – were considerably lower than allocated sub-ACLs for each of the past several years. Moreover, the specification of 20,000 mt for USAP did not restrict either the operation or the expansion of the shoreside processing facilities during the 2007-2009 fishing years. However, this operation never materialized, and none of the USAP specification was used during the 2007-2009 fishing years. Consequently, the Council set USAP at zero for the 2010-2012, 2013-2015, and 2016-2018 fishing years. The Council has not received any information that would suggest changing this specification for the 2019-2021 fishing years. Therefore, **the specification of USAP for the 2019-2021 fishing years would remain at 0 mt.**

Commented [DB8]:
Cmte Motion #5:
Recommend the Council set US At-Sea Processing (USAP) at 0mt for this specifications package.
Vote: 12:0:0

2.2.4 Management area sub-ACLs for 2019-2021

Commented [DB9]:
By consensus, recommend to the Council that sub-ACL % allocations not be included in Framework 6.

2.2.5 Seasonal (monthly) sub-ACL divisions

The herring sub-ACL in two of the four management areas is allocated by season, allocating 0% for several months, essentially closing the area to herring fishing during those months.

This action is not considering modifying the seasonal sub-ACL divisions that have been in place

- Area 1A: 0% January-May; 100% June-December;
- Area 1B: 0% January-April; 100% May-December.

Commented [DB10]:
Under Other Business – not for this action.

Cmte Motion #9
Recommend the Council consider the following topic when it discusses potential 2020 work priorities for the herring plan:
consider modifying measures in the herring plan that that potentially inhibit optimizing yield in the mackerel fishery (i.e. modify the relatively low 2,000 pound incidental possession limit that is implemented after directed herring fisheries are closed, and modify the seasonal closure of Area 1B that is currently closed January-April).
Vote: 11:0:1, carries

2.2.6 Research Set-Aside (RSA)

The RSA process is a competitive grants process administered by the Northeast Fisheries Science Center. Proposals are requested for research, and incoming proposals are reviewed and ranked by a technical body. With competitive grants awarded through this process, different entities will apply. In the past, the Council has allocated either 0% or 3% of the sub-ACL for each management area for the RSA program. The regulations allow a set-aside of up to 3% in any or all herring management areas. The most recent specifications, FY2016-2018, deducted a

3% RSA from the ACL for all management areas and identified four research priorities: portside sampling, RH bycatch avoidance, electronic monitoring, and research to support herring stock assessments.

In December 2017 the Council approved research priorities for FY2019-2021 and an announcement for potential funding came out in summer 2018. Final awards are expected soon, and would be subject to this action approving set-aside. Five research priorities were approved, in no particular order of priority. **The specification for RSA for 2019-2021 fishing years is 3% of each herring management area sub-ACL.**

Council approved priorities for Herring RSA (2019-2021)

- Portside sampling and bycatch avoidance projects primarily related to haddock and river herring/shad;
- Stock structure and spatial management projects – in particular, continued work on:
 - (a) distinguishing among subcomponents of the herring resource
 - Gulf of Maine, Georges Bank, and Southern New England – and identifying stocks of origin from mixed catches,
 - (b) identifying the relative size of stock components, movements, and mixing rates,
 - (c) ascertaining the degree of homing, and
 - (d) investigating potential effects of climate change;
- Research spawning dynamics, including projects related to life history, gear interactions, and spatial patterns, including studies to evaluate whether gear interactions disrupt spawning and negatively affect recruitment due to egg disposition and survival;
- Localized depletion studies to evaluate the influence of potential localized depletion of herring on predators; and
- Projects designed to evaluate discard rates and mortality of released fish in the purse seine fishery.

2.2.7 Fixed Gear Set-Aside (FGSA)

Amendment 1 to the Atlantic Herring FMP allows up to 500 mt of Atlantic herring to be set-aside until November 1 for fixed gear fishermen fishing West of Cutler, ME. The set-aside comes out of the Area 1A sub-ACL at the start of the year, and is returned later in the year if it is not used. The set-aside has been 500mt some years, was 295mt from 2013-2018, and some years the Council has recommended it be set to zero. Most recently in 2019 it was set to 39mt; this value was recommended by the Council as a reduction that would be proportional to other reductions implemented for 2019.

Amendment 2 to the Interstate FMP (ASMFC, 2016???) requires fishermen East of Cutler to report catch weekly through the federal IVR system. MEDMR requires the Maine state commercial fixed gear fishermen to comply with the federal IVR weekly reporting requirements and regulations as well as reporting monthly to MEDMR. That action also modified the date that FGSA reverts back to Area 1A to December 31.

Table 12 provides updated catch estimates from the fixed gear fishery through 2014.

Commented [DB11]:

Cmte Motion #6

Recommend the Council set research set-aside (RSA) at 3% of each sub-ACL in this specification package.

Vote: 12:0:0, carries

Commented [DB12]:

Cmte Motion #7

Recommend the Council set the fixed-gear set-aside (FGSA) at a level that is equivalent to the same proportional reduction from 2019 to 2020 as the total fishery reduction.

Vote: 12:0:0, carries

Table 12 - Atlantic herring landings from fixed gear fishery, before and after November 1 rollover date

Year	Sub-ACL Closure Date	Area 1A Sub-ACL (mt)	Cumulative Catch (mt) by Dec 31	Fixed Gear Landings (mt)	
				Jan-Oct	Nov-Dec
2004	11/19/2004	60,000	60,071	49	0
2005	12/2/2005	60,000	61,570	53	0
2006	10/21/2006	50,000	59,980	528	0
2007	10/25/2007	50,000	49,992	392	0
2008	11/14/2008	43,650	42,257	24	0
2009	11/26/2009	43,650	44,088	81	0
2010	11/17/2010	26,546	27,741	823	0
2011	10/27/2011	29,251	29,359	23	0
2012	11/5/2012	27,668	25,057	0	0
2013	10/15/2013	29,775	29,820	C	C
2014	10/26/2014	33,031	33,428	C	C

Source: ASMFC.
Note: "C" denotes that the value cannot be reported due to confidentiality.

(will update this table for 2019-2021 specs document)

2.3 ALTERNATIVES FOR 2019-2021 RIVER HERRING/SHAD (RH/S) CATCH CAPS

2.3.1 No Action (Alternative 1)

Rh/S catch caps implemented in the 2019 in-season adjustment implemented by NMFS would rollover. These allocations were first implemented in the 2016-2018 specifications package and were used again for 2019. If this alternative is selected these values would remain in place for fishing years 2020 and 2021.

Rationale: These caps would be set based on removals from the reference period, before caps were in place. Since there is no biologically based estimate of RH/S, these caps at least represent a maximum amount of bycatch from a reference period.

Background: During the 2016-2018 specification process these values were derived from the method that was considered the best technical approach for determining recent RH/S catch estimates in support of the goals and objectives of Framework 3, primarily to provide strong incentive for the industry to continue to avoid RH/S and reduce RH/S catch to the extent practicable. When the PDT developed this method it argued that these years represent a “reference period” before catch caps were adopted (2008-2014). Going forward the PDT did not recommend continuing to include additional years to this reference period. Including years the fishery is under a cap may provide incentive for fishermen to increase their RH/S catch, which is in opposition to the goal of the RH/S catch caps.

Table 13 – 2019 RH/S catch caps in the herring fishery, implemented by NMFS through in-season adjustment

RH/S catch caps	Allocation (MT)
MWT GOM	76.7
MWT Cape Cod	32.4
MWT SNE/MA	129.6
BT SNE/MA	122.3

2.3.2 Other alternatives?

A sub-group of Herring PDT members reviewed a list of several possible ideas. Ultimately the sub-group does not recommend the Committee include any of these ideas in this action. The full PDT discussed this issue on a conference call on March 15 and the PDT agrees that the Committee should not include these as potential alternatives, but wanted to provide input for the discussion.

Commented [DB13]:
 The Committee did not develop a motion or consensus statement for RH/S alternatives.

 They did not identify any alternatives to be added, thus the No Action caps would rollover for 2020 and 2021 in this action if no other alternatives are included.

1. Adjust RH/S catch caps proportional to herring ACL

As herring ACL increases, so does RH/S caps, and when herring ACL decreases, so does RH/S caps. The same ratio used to adjust the Atlantic herring catch limit would be applied to the RH/S catch cap.

PDT input – The PDT does not support consideration of this as an alternative. This is a departure from the rationale used to set the RH/S catch caps, which was intended to limit total bycatch amount to that of a reference period regardless of directed Atlantic herring effort. As such management is on total removals from the river herring resource, no a bycatch rate.

2. Same method for setting caps with updated years

Last three years would be used (2016-2018) to develop a RH/S cap for each area.

PDT input – The PDT does not support consideration of this as an alternative. The PDT does not think this alternative is consistent with Purpose #1 of these measures – to provide incentive for herring vessels to reduce RH/S bycatch. If the RH/S catch cap is based on years when the fleet is under a cap, there will be incentive for the directed herring fishery to catch RH/S to keep caps higher.

3. Survey index based cap

Caps would be based on trend from survey index.

PDT input – The PDT does not support consideration of this as an alternative. There are currently no reliable fishery dependent or independent data sets to inform this approach; the most recent assessment was not able to produce a coast-wide or regional index of RH relative abundance. PDT members have explored several surveys and to date there is not a consistent signal across the available survey datasets. For example, the trends from the

federal survey are in the opposite direction of the MA state survey. The data are currently insufficient to support this approach, which is the same conclusion as the ASMFC assessment.

4. Original allocations

The table below includes the original catch caps implemented in Framework 3, which used an older method that was later determined to be inferior to the one used in 2016-2018 specs. In Framework 3 the same years were used as the baseline (2008-2014) but an updated method was applied.

RH/S Catch Cap Area and Gear	RH/S catch cap allocation (mt)
CC MWT	13
GOM MWT	86
SNE BT	89
SNE MWT	124

PDT input - The PDT does not support consideration of this as an alternative. The method used to calculate these catch caps was found to be inferior to the one used in the 2016-2018 package so there would be no support for applying an inferior method.

5. Two-phase approach – holding quota back

Develop an alternative similar to how the catch caps are set in the mackerel plan that allocates a portion of the overall cap, and only releases the remaining catch cap when herring catches exceed a certain amount. This would increase incentive to avoid RH/S during the fishing year so that more RH/S would be available later in the fishing year.

PDT input - The PDT does not support consideration of this as an alternative. This alternative may help the Atlantic herring fishery catch more of the herring sub-ACL if it helps increase incentive to avoid RH/S and slows bycatch during the season, but the overall impact on RH/S could be the same if the overall cap (in mt) is the same value overall. This approach could be particularly challenging to monitor in the next few years ahead with relatively low herring ACLs and lower observer coverage rates. It will be difficult enough to monitor the four RH/S gear and area caps in the coming years, let alone introducing sub-caps. Because the bycatch rates at the beginning of the year are based on the catch rates of the previous year (until enough observed trips occur), a cap closure could be triggered in an area without any observed trips from that year. That would be more likely to occur if the caps in the early portion of the year were reduced due to a split cap.

2.3.3 General PDT input on RH/S catch cap alternatives

1. *Setting bycatch catch caps for RH/S in the herring fishery is problematic without an estimate of RH/S biomass or an index of relative abundance. The rationale used in Framework 3 was that the catch caps implemented would serve as a precautionary place mark to limit RH/S total removals by the fishery to a historical average. This*

management measure was to be in place until a biomass based assessment because available for RH/S. Since the updated assessment in 2017 was not able to produce biomass based estimates, the PDT recommends the Committee may want to explore other ways to minimize RH/S bycatch and reduce incentive to catch RH/S. Other measures, such as time/area closures, may be more effective for minimizing RH/S bycatch, given the lack of information available about the size and status of RH/S populations. The PDT has explored the idea of potential time area closures and triggers in the past and these analyses would require work to update and/or modify. Finally, the proposed MWT prohibition area approved by the Council in Amendment 8 may have limited benefits for RH/S bycatch, but would not address potential impacts of BT fishing effort.

2. *Observer coverage rates are lower now than when these catch caps were set in Framework 3; therefore, there is less data available to inform potential caps. Observer coverage and monitoring is expected to improve again in near future after IFM implementation, but for the time being there is very limited data to inform this issue.*
3. *An effective measure that has indirect benefits for reducing bycatch is reducing the ACL of target species. FY2019-2021 will have greatly reduced herring ACLs compared to previous years and that is expected to have positive impacts on bycatch compared to bycatch associated with recent herring allocations and catch levels.*

3.0 ALTERNATIVES CONSIDERED BUT REJECTED

4.0 AFFECTED ENVIRONMENT

4.1 ATLANTIC HERRING

4.2 NON-TARGET SPECIES (BYCATCH)

4.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

4.4 PROTECTED RESOURCES

4.5 FISHERY RELATED BUSINESSES AND COMMUNITIES

4.5.1 Directed Atlantic herring fisheries and related businesses

(Including herring, mackerel, and lobster industries)

4.5.2 Predator fisheries and related businesses

(Including commercial, recreational, and ecotourism industries)

4.6 CUMULATIVE EFFECTS

5.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

6.0 APPLICABLE LAWS / EXECUTIVE ORDERS

7.0 REFERENCES

8.0 INDEX

APPENDICES

I. Final SSC Report (October 2018)