

Mackerel Closure Framework (Framework 12) ATLANTIC MACKEREL, SQUID, AND BUTTERFISH FISHERY MANAGEMENT PLAN

Measures to Modify Atlantic Mackerel In-Season Closure Provisions

Includes Draft Supplemental Environmental Assessment and
Initial Regulatory Flexibility Analysis



Atlantic Mackerel
Scomber scombus

Prepared by the

**Mid-Atlantic Fishery Management Council (Council) in collaboration with the
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1.0 EXECUTIVE SUMMARY AND TABLE OF CONTENTS

This supplemental environmental assessment (SEA) updates the attached previously approved Environmental Assessment (EA) for: “Specifications and Management Measures For: Atlantic Mackerel (2016-2018, Including River Herring and Shad Cap); Butterfish Mesh Rules; and Longfin Squid Pre-Trip Notification System (PTNS)” (also described in this document as the “2016-2018 Mackerel EA” or “original EA”) that analyzed the catch limits, commercial quotas, recreational harvest limits, and management measures (called specifications) for Atlantic Mackerel for the 2016-2018 fishing years. This document is not a stand-alone document, but rather a supplement and is intended to be utilized in conjunction with the previously approved EA (final rule 4/26/16: <https://www.greateratlantic.fisheries.noaa.gov/regs/2016/April/16msb2016specsfr.pdf>). Unless otherwise noted, the original EA prepared for this action and attached to this SEA remains applicable. Therefore, sections addressed in this supplement should be considered within the context of the original EA.

In this Framework Adjustment to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP) the Council considers measures to modify the in-season closure provisions for the Atlantic mackerel (“mackerel” hereafter) fishery.

The objective of this action is to: Consider changing the provisions for limiting mackerel landings once the commercial quota has been reached. The Council is considering this objective because the current closure provisions, which prohibit commercial possession once 100% of the commercial quota (“Domestic Annual Harvest or ‘DAH’”) is landed, may cause negative economic impacts to the mackerel and herring fisheries that may not have been fully understood when those measures were set. Recent landings projections by Council staff suggest the mackerel fishery may reach 100% of the DAH and close in November or December 2018, but given the additional 2.3 million pound management uncertainty buffer in place, completely prohibiting commercial possession appears unnecessary to avoid Annual Catch Limit (ACL) overages. Alternative measures can mitigate the operational and economic impacts of a total closure while still appropriately conserving the mackerel resource and meeting the objectives of the FMP.

After the potential impacts of a total mackerel possession prohibition were highlighted by the public, the Council deliberated on the issue at its April 2018 and June 2018 meetings. The New England Fishery Management Council also discussed the issue in June 2018 and expressed support for actions that would avoid the full prohibition of mackerel possession due to impacts on the Atlantic herring (“herring” hereafter) fishery, which at times cannot avoid some mackerel catches. The MSB Advisory Panel also discussed the issue at its April 13, 2018 meeting and generally supported the Council considering changing the trip limit when 100% of the quota is reached from zero to 5,000 or 10,000 pounds, which are the options considered in this document.

The Council accepted comments at both Council meetings and selected the preferred alternative in June 2018 to recommend to NOAA Fisheries for approval and implementation. NOAA Fisheries will publish a proposed rule along with this Supplemental Environmental Assessment for public comment. After considering public comments on the proposed rule, NOAA Fisheries will publish a final rule with implementation details as long as the action is ultimately approved by NOAA Fisheries. The Council has recently approved an Amendment that would set mackerel specifications for 2019-2021, and that action will supplant this action, so the measures contained in this action will likely only be effect for a relatively short time, from late 2018 until early 2019.

To satisfy the impact analysis requirements of the National Environmental Policy Act (NEPA), this environmental assessment (EA) supplements the previous Specifications EA for mackerel (MAFMC 2015). That EA analyzed the impacts on the human environment of the mackerel specifications, including any impacts to Endangered Species Act (ESA) listed species and marine mammals. This action would only slightly modify the measures previously considered and approved for the mackerel fishery with that EA. This document describes the preferred action to adjust the mackerel possession limit and examines the potential impacts of alternatives considered. Updated information on the Atlantic mackerel resource and fishery is also presented and considered. All actions are potential until implemented by NOAA Fisheries. The proposed alternatives are expected to result in positive benefits to the nation by maintaining the sustainability of the resources and achieving optimum yield (i.e., fully harvesting available quotas). This action should not result in significant impacts on valued ecological components. Because the preferred alternative is not associated with significant impacts to the biological, social, economic, or physical environment, a "Finding of No Significant Impact" (FONSI) has been made. . Summaries of the preferred alternative and its expected impacts are provided below. Details of all alternatives and their impacts are in Sections 5 and 7, respectively.

Alternative 2 (PREFERRED). This alternative would change the trip limit once 100% of the DAH is landed from zero pounds to 5,000 pounds.

Target Species - Longfin squid, *Illex* squid, and butterfish are not caught in substantial quantities in the mackerel fishery relative to their catch limits and should not be impacted. Any bycatch of these species is also tracked and accounted for. The preferred trip limit is not high enough to lead to large-scale targeting of mackerel, but will lead to some small-scale targeting by automatic (auto) jig hook and line fishing and also support herring fishing, which does have incidental catch of mackerel. The auto jig fishery constitutes a minor portion of the fishery. Given the low preferred trip limit however, this action will only lead to a small amount of additional mackerel catch. Mackerel has been declared overfished with overfishing occurring in 2016 based on a recent assessment. However, projections from the recent assessment suggest that the small amount of additional mackerel catch expected from the preferred alternative will not interfere with mackerel rebuilding because those projections already assume that the potential extra mackerel that may be caught under the preferred alternative will be caught. Therefore only a slight negative impact on mackerel is expected. This action would increase the likelihood that more of the Atlantic herring quotas would be reached by not inadvertently limiting Atlantic herring fishing due to an inability to retain some Atlantic mackerel.

Non-Target Species – Non-target species impacts should be similar as described in the previous EA. There are relatively low non-target species interactions in the mackerel fishery. The primary species of concern highlighted in the 2015 EA were blueback herring, alewife, and American shad in the trawl fishery (bottom or mid-water). The low trip limit proposed should not lead to additional trawl effort beyond what is typically observed in the fishery. The late-season (November-December) jig fishery, while lightly observed 2015-2017 (4 trips targeting mackerel with handline or auto-jig handline Oct-Dec), had minimal bycatch, with only small amounts of Atlantic herring and spiny dogfish (mostly spiny dogfish, four-tenths of one percent total non-mackerel catch). The auto jig fishery constitutes a minor portion of the fishery. Therefore the additional effort expected compared to no action should not change non-target impacts. Accordingly, no overall change in expected non-target impacts (i.e. low negative, similar to previous years) is expected. Since no action would prohibit mackerel possession and likely reduce effort somewhat, the proposed action would have slightly more impacts compared to no action. Indirectly, the action supports the previously analyzed and approved operation of the herring fishery, and

non-target impacts of that fishery have been previously considered (NEFMC 2016).

Habitat - Habitat impacts should be similar as described in the previous EA. The low trip limit proposed should not lead to additional trawl effort beyond what is typically observed in the fishery. The additional late-season effort expected in the jig fishery compared to no action should not change habitat impacts given the minimal contact with the bottom. Accordingly, no overall change in expected habitat impacts (i.e. low negative, similar to previous years) is expected. Since no action would prohibit mackerel possession and likely reduce bottom trawl effort somewhat, the proposed action would have slightly more impacts compared to no action. Indirectly, the action supports the previously analyzed and approved operation of the herring fishery, and habitat impacts of that fishery have been previously considered (NEFMC 2016).

Protected Resources – Protected resource (marine mammals, turtles, other endangered species) impacts should be similar as described in the previous EA. No overall change in expected protected resource impacts (i.e. low negative, similar to previous years) is expected. Since no action would prohibit mackerel possession once 100% of the quota was caught and likely lead to greater effort reductions than the proposed action, the proposed action would have slightly more impacts compared to no action. Indirectly, the action supports the previously analyzed and approved operation of the herring fishery, and protected resource impacts of that fishery have been previously considered (NEFMC 2016).

Human Communities – This action is expected to have a positive, but not significant, impact on fishing communities compared to no action since it would provide some additional fishing opportunities to vessels, particularly those that participate in the late-season mackerel jig fishery and those that participate in the late-season herring fishery. The additional ex-vessel revenues would also provide additional non-quantifiable economic and social benefits related to support services and employment due to the preservation of fishing activity.

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2.0 LIST OF COMMON ACRONYMS AND ABBREVIATIONS

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
ASMFC	Atlantic States Marine Fisheries Commission or Commission
B	Biomass
CFR	Code of Federal Regulations
CPH	Confirmation of Permit History
CV	coefficient of variation
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	Fishing Mortality Rate
FMP	Fishery Management Plan
FR	Federal Register
GB	Georges Bank
GOM	Gulf of Maine
IOY	Initial Optimum Yield
M	Natural Mortality Rate
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act (as amended)
MSB	Atlantic Mackerel, Squid, Butterfish
MSY	Maximum Sustainable Yield
MT (or mt)	Metric Tons (1 mt equals about 2,204.62 pounds)
NE	Northeast
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Level
PBR	Potential Biological Removal
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SNE	Southern New England
SSC	Scientific and Statistical Committee
US	United States
T1, T2, T3	Trimesters 1, 2, and/or 3 of the Longfin Squid Fishery
VTR	Vessel Trip Report

Notes: "Mackerel" refers to "Atlantic mackerel" unless otherwise noted. Likewise "Herring" refers to Atlantic herring.

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4.0 INTRODUCTION, BACKGROUND, AND PROCESS

The mackerel fishery is currently managed with an annual quota and in-season proactive accountability measures. The stock Acceptable Biological Catch (ABC) is 19,898 metric tons (MT), and after Canadian catch is deducted, the U.S. ABC is 11,009 MT. There is a 683 MT recreational allocation (6.2%) and a 10,327 MT commercial allocation (93.8%). There is also a 10% management uncertainty buffer of 1,033 MT (over 2.2 million pounds), resulting in a commercial annual catch target (ACT) of 9,294 MT. 1.26% is set aside for expected discards, leaving a commercial quota or Domestic Annual Harvest (DAH) of 9,177 MT (20,231,356 pounds).

When the fishery starts each year, the various mackerel permit categories start with different trip limits. Tier 1 has an unlimited trip limit, Tier 2 has a 135,000 pound trip limit, and Tier 3 has a 100,000 trip limit. The open access incidental permit has a 20,000 pound trip limit. When the fishery reaches 95% of the DAH, all permits have 20,000 pound trip limits. When the fishery reaches 100% of the DAH, there is zero possession allowed by vessels with federal mackerel permits (which are required to fish for or possess mackerel in federal waters), even though there is a management uncertainty buffer of over 2.2 million pounds.

The mackerel fishery also operates under a river herring and shad catch cap (RH/S), which closes the directed mackerel fishery and implements a 20,000 pound trip limit for all permits once 82 MT of RH/S has been projected to be caught in the directed mackerel fishery. In 2018, the RH/S cap closed the mackerel fishery effective February 27, 2018, at which point approximately 88% of the mackerel DAH had been harvested. This was the first time the RH/S cap closed the mackerel fishery, and the first ever closure of the domestic mackerel fishery in general. Despite the early mackerel closure due to the RH/S cap, fishery participants, both small-scale mackerel jig fishermen and herring fishermen who participate in their respective fisheries late in the year raised concern to the Council that if mackerel reaches 100% of its quota and possession goes to zero pounds, they will be negatively impacted. Mackerel fishermen cited the lost mackerel revenue, and herring fishermen noted that when herring fishing they often have some mackerel mixed in, and would not be able to legally operate without some provision to cover incidental catch of mackerel. Landings projections by Council staff indicate a full closure could occur upon reaching 100% of the DAH at some point in November or December of 2018, depending on the actual pace of mackerel landings.

As this issue was being discussed, it was noted by MAFMC staff that the fishery currently has a 10%, 1,033 MT (2,276,614 pounds) management uncertainty buffer. This buffer is primarily designed to account for the difficulty in closing a high volume fishery like mackerel. However, since the RH/S cap has already effectively closed the high-volume part of the fishery, the buffer is unlikely to be utilized in its original intent. In addition, landings projections by Council staff suggest that if the fishery does not go to a zero possession limit at 100% of the DAH but rather a 5,000 pound trip limit, then only about 384,000 pounds would be additionally landed, which is a small part (17%) of the management uncertainty buffer.

The Council also considered that the mackerel stock has recently been declared overfished, with overfishing occurring in 2016 (NEFSC 2018). The Council is preparing a rebuilding plan via a separate action, but rebuilding projections using the methodology from the assessment indicate that the stock can be rebuilt in 3, 5, or 7-year timelines even if the full management uncertainty buffer is caught. In fact, those projections assume that the full management uncertainty buffer will be caught in 2018.

Given the at most slight negative impact on mackerel, and the potential economic benefits of avoiding a total mackerel closure (both from mackerel fishing and facilitating herring fishing), the Council is recommending, in this action, to change the trip limit once 100% of the DAH is landed from zero

pounds to 5,000 pounds. The Council deliberated on the issue at its April 2018 and June 2018 meetings. The New England Fishery Management Council also discussed the issue in June 2018 and expressed support for actions that would avoid the full prohibition of mackerel possession due to impacts on the herring fishery. The MSB Advisory Panel also discussed the issue at its April 13, 2018 meeting and generally supported the Council considering changing the trip limit when 100% of the quota is reached from zero to 5,000 or 10,000 pounds, which are the options considered in this document.

The Council accepted comments at both Council meetings and selected the preferred alternative in June 2018 to recommend to NOAA Fisheries for approval and implementation. NOAA Fisheries will publish a proposed rule along with this Supplemental Environmental Assessment for public comment. After considering public comments on the proposed rule, NOAA Fisheries will publish a final rule with implementation details as long as the action is ultimately approved by NOAA Fisheries.

This supplemental environmental assessment (SEA) updates the attached previously approved Environmental Assessment (EA) for: “Specifications and Management Measures For: Atlantic Mackerel (2016-2018, Including River Herring and Shad Cap); Butterfish Mesh Rules; and Longfin Squid Pre-Trip Notification System (PTNS)” (also described in this document as the “2016-2018 Mackerel EA” or “original EA”) that analyzed the catch limits, commercial quotas, recreational harvest limits, and management measures (called specifications) for Atlantic Mackerel for the 2016-2018 fishing years. This document is not a stand-alone document, but rather a supplement and is intended to be utilized in conjunction with the previously approved EA (final rule 4/26/16: <https://www.greateratlantic.fisheries.noaa.gov/regs/2016/April/16msb2016specsfr.pdf>). Unless otherwise noted, the original EA prepared for this action and attached to this SEA remains applicable. Therefore, sections addressed in this supplement should be considered within the context of the original EA.

4.1 OBJECTIVES, PURPOSE, AND NEED

This action is needed avoid unnecessary negative socioeconomic impacts to fishermen that could occur if a zero possession trip limit for mackerel is implemented. The purpose of this action is to consider ways to allow small scale and/or incidental mackerel landings without compromising biological considerations for the resources once the commercial Domestic Annual Harvest (DAH) has been achieved.

The objective of this action is to: Consider changing the provisions for limiting mackerel landings once the DAH has been reached. The Council is considering this objective because the current closure provisions, which prohibit commercial possession once 100% of the DAH is landed, may be restrictive and cause negative economic impacts. Alternative measures could mitigate the economic impacts and achieve optimum yield while still conserving the mackerel resource.

4.2 REGULATORY AUTHORITY

The MSA states that Fishery Management Plans (FMPs) shall “contain the conservation and management measures... necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery.” As discretionary provisions of Fishery Management Plans (FMPs), the MSA also allows restriction of fishing by gear/area/time/season. Seasonal management based on attainment of quotas has been previously incorporated into the MSB FMP and this action could modify the existing provisions regarding how the fishery closes due to attainment of the DAH.

4.3 FMP HISTORY AND MANAGEMENT OBJECTIVES

See original EA.

4.4 MANAGEMENT UNIT AND GEOGRAPHIC SCOPE

See original EA.

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5.0 WHAT ALTERNATIVES ARE CONSIDERED IN THIS DOCUMENT?

5.1 ALTERNATIVE 1: No Action/Status Quo = Zero Possession at 100% of Mackerel DAH.

The commercial mackerel fishery is currently managed with an annual quota and in-season proactive accountability measures. This is the same as Alternative 2 in the original EA. The stock Acceptable Biological Catch (ABC) is 19,898 metric tons (MT), and after Canadian catch is deducted, the U.S. ABC is 11,009 MT, which equals the Annual Catch Limit (ACL). There is a 683 MT recreational allocation (6.2%) and a 10,327 MT commercial allocation (93.8%). There is a 10% management uncertainty buffer of 1,033 MT, resulting in a commercial annual catch target (ACT) of 9,294 MT. 1.26% is set aside for expected discards, leaving a commercial quota or Domestic Annual Harvest (DAH) of 9,177 MT (20,231,356 pounds).

When the fishery starts each year, the various mackerel permit categories start with different trip limits. Tier 1 has an unlimited trip limit, Tier 2 has a 135,000 pound trip limit, and Tier 3 has a 100,000 trip limit. The open access incidental permit has a 20,000 pound trip limit. When the fishery reaches 95% of the DAH, all permits have 20,000 pound trip limits. When the fishery reaches 100% of the DAH, there is zero possession allowed by vessels with federal mackerel permits (which are required to fish for or possess mackerel in federal waters) until the beginning of the next fishery year (January 1).

Since mackerel has been declared overfished, any overages of the ACL must be repaid by the sector (commercial or recreational) that caused the overage.

5.2 ALTERNATIVE 2 (PREFERRED): 5,000 Pound Trip Limit at 100% of Mackerel DAH

The operation of the commercial mackerel fishery would be the same as Alternative 1 or 3, except that when the fishery reaches 100% of the DAH, there would be a 5,000 pound trip limit for all vessels with federal mackerel permits (which are required to fish for or possess mackerel in federal waters) until the beginning of the next fishery year (January 1).

5.3 ALTERNATIVE 3: 10,000 Pound Trip Limit at 100% of Mackerel DAH

The operation of the commercial mackerel fishery would be the same as Alternative 1 or 2, except that when the fishery reaches 100% of the DAH, there would be a 10,000 pound trip limit for all vessels with federal mackerel permits (which are required to fish for or possess mackerel in federal waters) until the beginning of the next fishery year (January 1).

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

This section identifies and describes the *valued ecosystem components* (“VECs”; Beanlands and Duinker 1984) that comprise the affected environment and may be affected by the alternatives proposed in this document. The valued ecosystem components are identified and described here as a means of establishing the context for the impact analysis that will be presented in Section 7’s “Analysis of Impacts.” The significance of the various impacts of the proposed alternatives on the valued ecosystem components are also assessed from a cumulative effects perspective at the end of Section 7. The valued ecosystem components are:

1. Managed resources (Atlantic mackerel, longfin squid and *Illex* squid, and butterfish) and non-target species.
2. Habitat including EFH for the managed resources and non-target species
3. Endangered and other protected resources
4. Human communities

The affected environment consists of those physical, biological, and human components of the environment that are or will be meaningfully connected to mackerel fishing operations, and are described below. Overviews of the managed species in the FMP and of the physical environment are described first, to establish the context for the valued ecosystem components. While butterfish, longfin squid, and *Illex* squid should be negligibly affected by this action, summaries are provided since they are in the FMP. A summary for Atlantic herring is also included given the overlap with the mackerel and Atlantic herring fisheries. Impacts of the alternatives on the physical environment are addressed through analysis of impacts on habitat, as most of the impacted physical environment comprises EFH for various species.

The affected environment was described in the original EA (attached), and this section updates the description of the affected environment where changes have occurred.

6.1 DESCRIPTION OF THE MANAGED RESOURCES AND NON TARGET FISH SPECIES

Mackerel

Background on the biology of mackerel is described in the original EA. The current status of Atlantic mackerel is overfished with overfishing occurring as of data through 2016 based on the results of SAW 64 (NEFSC 2018), and a rebuilding action will be implemented. However, because of a strong recruitment year-class (eggs spawned in 2015), the stock is projected to rebuild to target levels relatively quickly. Rebuilding projections also indicate there was likely no overfishing in 2018 and that the stock should have climbed above the overfished threshold (50% of the proxy for the spawning stock biomass associated with maximum sustainable yield) in 2018. The stock will be designated overfished until 100% rebuilt. As is normal for assessments and projections, the terminal recruitment year-class is among the most uncertain outputs of the assessment, so the exact path of stock rebuilding still has considerable uncertainty.

Butterfish

Background on the biology of butterfish is described in the original EA.

The status of butterfish is not overfished (above target biomass) with no overfishing occurring according to a recent assessment update (NEFSC 2017a – available at <http://www.mafmc.org/ssc-meetings/2017/may-17-18>). The assessment update found that butterfish was at 141% of the target biomass in 2016. However, the update integrated recent trawl survey information that indicates recent recruitment has been poor, so biomass is expected to decline to below the SSB_{msy} target in 2017, but not below the overfished threshold. Fishing mortality appears to have been very low in recent years, so the decline is not a result of overfishing but rather poor recruitment. If recruitment returns to average levels, then the stock is predicted to build above the SSB_{msy} target by 2020 (http://www.mafmc.org/s/butterfish_projections_2018-2020.xlsx). Butterfish recruitment is variable, and the terminal year recruitment was underestimated the last time the assessment model was run (2014), so it is not unreasonable to expect recruitment to be closer to average levels over the course of the projection.

Longfin Squid

Background on the biology of longfin squid is described in the original EA. Longfin had a stock assessment update in 2017, which found the stock biomass to be at 174% of the target in 2016, even higher than the 128% of target biomass in 2009 in the 2011 benchmark assessment. The assessment update is available at <http://www.mafmc.org/ssc-meetings/2017/may-17-18>. ABCs are set by the Council's SSC to avoid overfishing given the best available science. See <http://www.mafmc.org/ssc> for details on how ABCs are set for this species.

Illex squid

See original EA.

Atlantic herring

Atlantic herring are migratory fish that live in large schools along the continental shelf from Labrador, Canada through Cape Hatteras, NC. Atlantic herring have supported an important commercial fishery since the late 19th century and play a very important role in the ecosystem as forage fish for many predators including marine mammals, larger fish, and seabirds, which support additional commercial, recreational, and ecotourism industries. Atlantic herring also provide effective and affordable bait to the lobster fishery, as well as other commercial and recreational fisheries. Finally, a smaller component of herring is landed and sold for human consumption, typically overseas. The status of herring is not overfished with overfishing not occurring, but an ongoing assessment is suggesting biomass declines due to low recruitment, which may affect future management. Additional life history information is detailed in the EFH document for the species (Reid et al 1999), located at: <http://www.nefsc.noaa.gov/nefsc/habitat/efh/>. Additional management and population status information can be found in the last herring specifications EA (NEFMC 2016).

Non-Target Species

Non-target interactions in the longfin squid, *Illex* squid, and butterfish fisheries were recently described in the EA for the 2018-2020 specifications for those species (MAFMC 2017). Nothing in this action should affect the operation of those fisheries or their impact on non-target species.

Mackerel Non-Target Species

Various species are caught incidentally by the mackerel fishery. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. These species will be impacted to some degree by the prosecution of the mackerel fishery. Mackerel non-target interactions were described in the EA for 2016-2018 mackerel specifications (MAFMC 2016). As described in that document, non-target interactions constitute a relatively small part of the catch in the mackerel fishery – discards are less than 1% of catch, and mackerel, Atlantic herring, and butterfish account for 98% of all catch (retained plus discarded). The primary non-target species of current concern for mackerel are river herrings (alewife and blueback herring) and shads (American and hickory) (RH/S). Their populations are depleted in most river systems, and the RH/S cap limits catch of RH/S in the mackerel fishery. The text and table below update a similar analysis on incidental catch and discards in the mackerel fishery from the 2016-2018 EA with more recent data (2015-2017 now vs 2011-2013 then).

The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. Presumably some criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal. Thus to begin this process, staff first reviewed 2015-2017 trips in the dealer weighout database to see if a certain trip definition could account for most mackerel landed. The result of this review resulted in the following definition for mackerel trips using landings: All trips that had at least

50% mackerel by weight and all trips over 100,000 pounds of mackerel regardless of the ratio of other species. This definition results in capturing 90% of all mackerel landings in the dealer weighout database 2015-2017. The other trips with lower mackerel landings landed a variety of species, mostly Atlantic herring, silver hake, longfin squid, and scup. The set of trips in the observer database with the same mackerel criteria included 9 on average for each year 2015-2017. These trips made 124 hauls of which 89% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water, etc.

Information on catch and discards is provided for observed hauls in the table below for species with at least 500 pounds of observed catch, with 500 pounds used as a proxy for catch that might be more than negligible. Since there were so few observed trips, extrapolations are not made but the total observed values are provided. Also, fishermen and processors on the Council’s MSB Advisory Panel have also reported that mackerel caught in recent years are often caught incidental to Atl. herring fishing rather than during directed mackerel fishing because of the lack of fishable mackerel concentrations. This updated information is generally consistent with the previous analysis.

Table 1. Incidental Catch in the Mackerel Fishery

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded
MACKEREL, ATLANTIC	3,654,528	1,205	3%	0%
HERRING, ATLANTIC	1,294,838	1,577	4%	0%
BUTTERFISH	113,021	1,676	4%	1%
HAKE, SILVER (WHITING)	49,095	16,729	37%	34%
HERRING, NK	15,505	865	2%	6%
DOGFISH, SPINY	11,498	11,498	26%	100%
SQUID, ATL LONG-FIN	10,426	493	1%	5%
ALEWIFE	6,797	2,682	6%	39%
FISH, NK	3,567	3,567	8%	100%
HERRING, BLUEBACK	2,853	29	0%	1%
SHAD, AMERICAN	1,830	1,578	4%	86%
HADDOCK	899	323	1%	36%
HAKE, RED (LING)	575	324	1%	56%
SKATE, WINTER (BIG), WINGS	510	.	.	.
DORY, BUCKLER (JOHN)	506	481	1%	95%

An auto-jig fishery has developed in recent years. This fishery, while lightly observed 2015-2017 (13 trips targeting mackerel with handline or auto-jig handline), had minimal bycatch (primarily spiny dogfish). This is a small component of the overall fishery.

Atlantic herring are not non-target species since the directed fishery targets mackerel and Atlantic herring. Non-negligible non-target species therefore include silver hake, spiny dogfish, alewife, blueback herring, American shad, haddock, red hake, winter skate, and John Buckler Dory. Of these red hake is experiencing overfishing and is overfished (<https://www.nefsc.noaa.gov/publications/crd/crd1802/crd1802.pdf>). There is no assessment for John Buckler Dory. Alewife, blueback herring, and American shad have been found to be

depleted by the ASMFC, and assessment information is available at www.asmfc.org. Assessments for silver hake, spiny dogfish, haddock, and winter skate (not overfished, no overfishing) can be found at <https://www.nefsc.noaa.gov/saw/>.

6.2 PHYSICAL ENVIRONMENT AND HABITAT, INCLUDING EFH

Only updates necessary beyond the original EA are provided in this section.

Ecosystem Considerations

The Council recently adopted an Ecosystem Approach to Fisheries Management (EAFM) Guidance Document, available at <http://www.mafmc.org/eafm/>. It is anticipated that the EAFM Guidance Document will serve through a transitional period where ecosystem considerations are introduced into Council management in an evolutionary fashion. Some highlights from the EAFM Guidance Document that could apply to MSB management include:

- It is the policy of the Council to support the maintenance of an adequate forage base in the Mid-Atlantic to ensure ecosystem productivity, structure and function and to support sustainable fishing communities.
- The Council could adopt biological reference points (overfishing levels or OFL) for forage stocks that are more conservative than the required MSA standard of F_{MSY} .
- The Council could modify the existing risk policy to accommodate ecosystem level concerns for forage species by reducing the maximum tolerance for risk of overfishing.
- The Council will promote the timely collection of data and development of analyses to support the biological, economic and social evaluation of ecosystem-level connections, tradeoffs, and risks, including those required to establish an optimal forage fish harvest policy.
- Habitat and climate change considerations will be more fully integrated into fishery management decisions.

The NEFSC also produces regular updates on conditions of the Northeast Shelf Ecosystem, which may be accessed via <https://www.nefsc.noaa.gov/ecosys/>. Highlights from the Spring 2017 Update include:

- Sea surface temperatures (SSTs) in the Northeast Shelf Large Marine Ecosystem during 2016 continue to be above average; in some season/area time series, 2016 was the second warmest year on record.
- The fall bloom on the Northeast Shelf was well developed in the Gulf of Maine, and, though chlorophyll concentrations on Georges Bank were elevated, a distinct bloom was not detected.
- Cool water habitats (5-15°C), which form the core thermal habitats of the Northeast Shelf, were at average levels in 2016, whereas warm habitats (16-27°C) were at high levels reflecting the trend of increasing warm habitat in recent years.
- The variability of daily sea surface temperature has increased over recent decades as indicated by the trends in standard deviation of daily temperature.
- The fall distribution of fish and invertebrate species sampled by the NEFSC shows that most species have moved to the Northeast and into deeper water.
- The strength of temperature fronts has increased over much of the Northeast Shelf; the 2016 frontal magnitudes for Northeast Shelf ecoregions moderated compared to recent years.

Habitat, Including Essential Fish Habitat (EFH)

There are lifestages of non-MSB federally-managed species that have designated EFH that may be susceptible to adverse impacts from bottom trawls used in MSB fisheries, depending on the geographic distribution of their essential habitats in relation to the footprint of MSB bottom trawl fishing activity. Most directed fishing for mackerel uses bottom trawl and mid-water trawl, though there is some handline/auto-jig fishery. Mid-water trawl and the auto-jig fishery should not affect the bottom, but bottom trawling does. EFH for all the federally-managed species in the region that could potentially be affected by mackerel bottom trawling activity is described in the following table (see Stevenson et al 2004):

Table 2. EFH descriptions for species vulnerable to trawl gear

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Acadian redfish	Juveniles	Gulf of Maine and the continental slope north of 37°38'N	50-200 in Gulf of Maine, to 600 on slope	Sub-tidal coastal and offshore rocky reef substrates with associated structure-forming epifauna (e.g., sponges, corals), and soft sediments with cerianthid anemones
Acadian redfish	Adults	Gulf of Maine and the continental slope north of 37°38'N	140-300 in Gulf of Maine, to 600 on slope	Offshore benthic habitats on finer grained sediments and on variable deposits of gravel, silt, clay, and boulders
American plaice	Juveniles	Gulf of Maine and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-180	Sub-tidal benthic habitats on mud and sand, also found on gravel and sandy substrates bordering bedrock
American plaice	Adults	Gulf of Maine, Georges Bank and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-300	Sub-tidal benthic habitats on mud and sand, also gravel and sandy substrates bordering bedrock
Atlantic cod	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including nearshore waters from eastern Maine to Rhode Island and the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	Mean high water-120	Structurally-complex intertidal and sub-tidal habitats, including eelgrass, mixed sand and gravel, and rocky habitats (gravel pavements, cobble, and boulder) with and without attached macroalgae and emergent epifauna
Atlantic cod	Adults	Gulf of Maine, Georges Bank, Southern New England, and the Mid-Atlantic to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	30-160	Structurally complex sub-tidal hard bottom habitats with gravel, cobble, and boulder substrates with and without emergent epifauna and macroalgae, also sandy substrates and along deeper slopes of ledges
Atlantic halibut	Juveniles & Adults	Gulf of Maine, Georges Bank, and continental slope south of Georges Bank	60-140 and 400-700 on slope	Benthic habitats on sand, gravel, or clay substrates
Atlantic herring	Eggs	Coastal Gulf of Maine, Georges Bank, and Southern New England	5-90	Sub-tidal benthic habitats on coarse sand, pebbles, cobbles, and boulders and/or macroalgae

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Atlantic sea scallop	Eggs	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Inshore and offshore benthic habitats (see adults)
Atlantic sea scallop	Larvae	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	No information	Inshore and offshore pelagic and benthic habitats: pelagic larvae (“spat”), settle on variety of hard surfaces, including shells, pebbles, and gravel and to macroalgae and other benthic organisms such as hydroids
Atlantic sea scallop	Juveniles	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats initially attached to shells, gravel, and small rocks (pebble, cobble), later free-swimming juveniles found in same habitats as adults
Atlantic sea scallop	Adults	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats with sand and gravel substrates
Atlantic surfclams	Juveniles and adults	Continental shelf from southwestern Gulf of Maine to Cape Hatteras, North Carolina	Surf zone to about 61, abundance low >38	In substrate to depth of 3 ft
Atlantic wolffish	Eggs	U.S. waters north of 41°N latitude and east of 71°W longitude	<100	Sub-tidal benthic habitats under rocks and boulders in nests
Atlantic wolffish	Juveniles	U.S. waters north of 41°N latitude and east of 71°W longitude	70-184	Sub-tidal benthic habitats
Atlantic wolffish	Adults	U.S. waters north of 41°N latitude and east of 71°W longitude	<173	A wide variety of sub-tidal sand and gravel substrates once they leave rocky spawning habitats, but not on muddy bottom
Barndoor skate	Juveniles and adults	Primarily on Georges Bank and in Southern New England and on the continental slope	40-400 on shelf and to 750 on slope	Sub-tidal benthic habitats on mud, sand, and gravel substrates
Black sea bass	Juveniles and adults	Continental shelf and estuarine waters from the southwestern Gulf of Maine and Cape Hatteras, North Carolina	Inshore in summer and spring	Benthic habitats with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas, also offshore clam beds and shell patches in winter
Clearence skate	Juveniles	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-30	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Clearnose skate	Adults	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-40	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom
Deep-sea red crab	Eggs	Outer continental shelf and slope throughout the region, including two seamounts	320-640	Benthic habitats attached to female crabs
Deep-sea red crab	Juveniles	Outer continental shelf and slope throughout the region, including two seamounts	320-1300 on slope and to 2000 on seamounts	Benthic habitats with unconsolidated and consolidated silt-clay sediments
Deep-sea red crab	Adults	Outer continental shelf and slope throughout the region, including two seamounts	320-900 on slope and up to 2000 on seamounts	Benthic habitats with unconsolidated and consolidated silt-clay sediments
Golden tilefish	Juveniles and adults	Outer continental shelf and slope from U.S.-Canada boundary to the Virginia-North Carolina boundary	100-300	Burrows in semi-lithified clay substrate, may also utilize rocks, boulders, scour depressions beneath boulders, and exposed rock ledges as shelter
Haddock	Juveniles	Inshore and offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in the Mid-Atlantic region	40-140 and as shallow as 20 in coastal Gulf of Maine	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel
Haddock	Adults	Offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in Southern New England	50-160	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel and adjacent to boulders and cobbles along the margins of rocky reefs
Little skate	Juveniles	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-80	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
Little skate	Adults	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-100	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
Longfin inshore squid	Eggs	Inshore and offshore waters from Georges Bank southward to Cape Hatteras	Generally <50	Bottom habitats attached to variety of hard bottom types, macroalgae, sand, and mud
Monkfish	Juveniles	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on a variety of habitats, including hard sand, pebbles, gravel, broken shells, and soft mud, also seek shelter among rocks with attached algae

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Monkfish	Adults	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on hard sand, pebbles, gravel, broken shells, and soft mud, but seem to prefer soft sediments, and, like juveniles, utilize the edges of rocky areas for feeding
Ocean pout	Eggs	Georges Bank, Gulf of Maine, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	<100	Sub-tidal hard bottom habitats in sheltered nests, holes, or rocky crevices
Ocean pout	Juveniles	Gulf of Maine, on the continental shelf north of Cape May, New Jersey, on the southern portion of Georges Bank, and including certain bays and estuaries in the Gulf of Maine	Mean high water-120	Intertidal and sub-tidal benthic habitats on a wide variety of substrates, including shells, rocks, algae, soft sediments, sand, and gravel
Ocean pout	Adults	Gulf of Maine, Georges Bank, on the continental shelf north of Cape May, New Jersey, and including certain bays and estuaries in the Gulf of Maine	20-140	Sub-tidal benthic habitats on mud and sand, particularly in association with structure forming habitat types; i.e. shells, gravel, or boulders
Ocean quahogs	Juveniles and adults	Continental shelf from southern New England and Georges Bank to Virginia	9-244	In substrate to depth of 3 ft
Offshore hake	Juveniles	Outer continental shelf and slope from Georges Bank to 34° 40'N	160-750	Pelagic and benthic habitats
Offshore hake	Adults	Outer continental shelf and slope from Georges Bank to 34° 40'N	200-750	Pelagic and benthic habitats
Pollock	Juveniles	Inshore and offshore waters in the Gulf of Maine (including bays and estuaries in the Gulf of Maine), the Great South Channel, Long Island Sound, and Narragansett Bay, Rhode Island	Mean high water-180 in Gulf of Maine, Long Island Sound, and Narragansett Bay; 40-180 on Georges Bank	Intertidal and sub-tidal pelagic and benthic rocky bottom habitats with attached macroalgae, small juveniles in eelgrass beds, older juveniles move into deeper water habitats also occupied by adults
Pollock	Adults	Offshore Gulf of Maine waters, Massachusetts Bay and Cape Cod Bay, on the southern edge of Georges Bank, and in Long Island Sound	80-300 in Gulf of Maine and on Georges Bank; <80 in Long Island Sound, Cape Cod Bay, and Narragansett Bay	Pelagic and benthic habitats on the tops and edges of offshore banks and shoals with mixed rocky substrates, often with attached macro algae
Red hake	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including Passamaquoddy Bay to Cape Cod Bay in the Gulf of Maine, Buzzards Bay and Narragansett Bay, Long Island Sound, Raritan Bay and the Hudson River, and lower Chesapeake Bay	Mean high water-80	Intertidal and sub-tidal soft bottom habitats, esp those that provide shelter, such as depressions in muddy substrates, eelgrass, macroalgae, shells, anemone and polychaete tubes, on artificial reefs, and in live bivalves (e.g., scallops)
Red hake	Adults	In the Gulf of Maine, the Great South Channel, and on the outer continental shelf and slope from Georges Bank to North Carolina, including inshore bays and estuaries as far south as Chesapeake Bay	50-750 on shelf and slope, as shallow as 20 inshore	Sub-tidal benthic habitats in shell beds, on soft sediments (usually in depressions), also found on gravel and hard bottom and artificial reefs

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Rosette skate	Juveniles and adults	Outer continental shelf from approximately 40°N to Cape Hatteras, North Carolina	80-400	Benthic habitats with mud and sand substrates
Scup	Juveniles	Continental shelf between southwestern Gulf of Maine and Cape Hatteras, North Carolina and in nearshore and estuarine waters between Massachusetts and Virginia	No information	Benthic habitats, in association with inshore sand and mud substrates, mussel and eelgrass beds
Scup	Adults	Continental shelf and nearshore and estuarine waters between southwestern Gulf of Maine and Cape Hatteras, North Carolina	No information, generally overwinter offshore	Benthic habitats
Silver hake	Juveniles	Gulf of Maine, including certain bays and estuaries, and on the continental shelf as far south as Cape May, New Jersey	40-400 in Gulf of Maine, >10 in Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats in association with sand-waves, flat sand with amphipod tubes, shells, and in biogenic depressions
Silver hake	Adults	Gulf of Maine, including certain bays and estuaries, the southern portion of Georges Bank, and the outer continental shelf and some shallower coastal locations in the Mid-Atlantic	>35 in Gulf of Maine, 70-400 on Georges Bank and in the Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats, often in bottom depressions or in association with sand waves and shell fragments, also in mud habitats bordering deep boulder reefs, on over deep boulder reefs in the southwest Gulf of Maine
Smooth skate	Juveniles	Offshore Gulf of Maine, some coastal bays in Maine and New Hampshire, and on the continental slope from Georges Bank to North Carolina	100-400 offshore Gulf of Maine, <100 inshore Gulf of Maine, to 900 on slope	Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine
Smooth skate	Adults	Offshore Gulf of Maine and the continental slope from Georges Bank to North Carolina	100-400 offshore Gulf of Maine, to 900 on slope	Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine
Summer flounder	Juveniles	Continental shelf and estuaries from Cape Cod, Massachusetts, to Cape Canaveral, Florida	To maximum 152	Benthic habitats, including inshore estuaries, salt marsh creeks, seagrass beds, mudflats, and open bay areas
Summer flounder	Adults	Continental shelf from Cape Cod, Massachusetts, to Cape Canaveral, Florida, including shallow coastal and estuarine waters during warmer months	To maximum 152 in colder months	Benthic habitats
Spiny dogfish	Juveniles	Primarily the outer continental shelf and slope between Cape Hatteras and Georges Bank and in the Gulf of Maine	Deep water	Pelagic and epibenthic habitats
Spiny dogfish	Female sub-adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
Spiny dogfish	Male sub-adults	Primarily in the Gulf of Maine and on the outer continental shelf from Georges Bank to Cape Hatteras	Wide depth range	Pelagic and epibenthic habitats
Spiny dogfish	Female adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
Spiny dogfish	Male adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Thorny skate	Juveniles	Offshore Gulf of Maine, some coastal bays in the Gulf of Maine, and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 om slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud
Thorny skate	Adults	Offshore Gulf of Maine and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 om slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud
White hake	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including bays and estuaries in the Gulf of Maine	Mean high water - 300	Intertidal and sub-tidal estuarine and marine habitats on fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats
White hake	Adults	Gulf of Maine, including coastal bays and estuaries, and the outer continental shelf and slope	100-400 offshore Gulf of Maine, >25 inshore Gulf of Maine, to 900 on slope	Sub-tidal benthic habitats on fine-grained, muddy substrates and in mixed soft and rocky habitats
Windowpane flounder	Juveniles	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to northern Florida, including bays and estuaries from Maine to Maryland	Mean high water - 60	Intertidal and sub-tidal benthic habitats on mud and sand substrates
Windowpane flounder	Adults	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to Cape Hatteras, North Carolina, including bays and estuaries from Maine to Maryland	Mean high water - 70	Intertidal and sub-tidal benthic habitats on mud and sand substrates
Winter flounder	Eggs	Eastern Maine to Absecon Inlet, New Jersey (39° 22'N) and Georges Bank	0-5 south of Cape Cod, 0-70 Gulf of Maine and Georges Bank	Sub-tidal estuarine and coastal benthic habitats on mud, muddy sand, sand, gravel, submerged aquatic vegetation, and macroalgae
Winter flounder	Juveniles	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 60	Intertidal and sub-tidal benthic habitats on a variety of bottom types, such as mud, sand, rocky substrates with attached macro algae, tidal wetlands, and eelgrass; young-of-the-year juveniles on muddy and sandy sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks
Winter flounder	Adults	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 70	Intertidal and sub-tidal benthic habitats on muddy and sandy substrates, and on hard bottom on offshore banks; for spawning adults, also see eggs
Winter skate	Juveniles	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries from eastern Maine to Chincoteague Bay, Virginia, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-90	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Winter skate	Adults	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries in Maine and New Hampshire, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-80	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud
Witch flounder	Juveniles	Gulf of Maine and outer continental shelf and slope	50-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
Witch flounder	Adults	Gulf of Maine and outer continental shelf and slope	35-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
Yellowtail flounder	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	20-80	Sub-tidal benthic habitats on sand and muddy sand
Yellowtail flounder	Adults	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	25-90	Sub-tidal benthic habitats on sand and sand with mud, shell hash, gravel, and rocks

Fishery Impact Considerations

Because there have been no significant changes to the manner in which the MSB fisheries are prosecuted relative to the original EA, and because none of the alternatives being considered in this document should have more than a minimal and/or temporary adverse impact (see section 7.0), no additional alternatives to minimize adverse effects on EFH are considered as part of this management action.

6.3 HUMAN COMMUNITIES AND ECONOMIC ENVIRONMENT

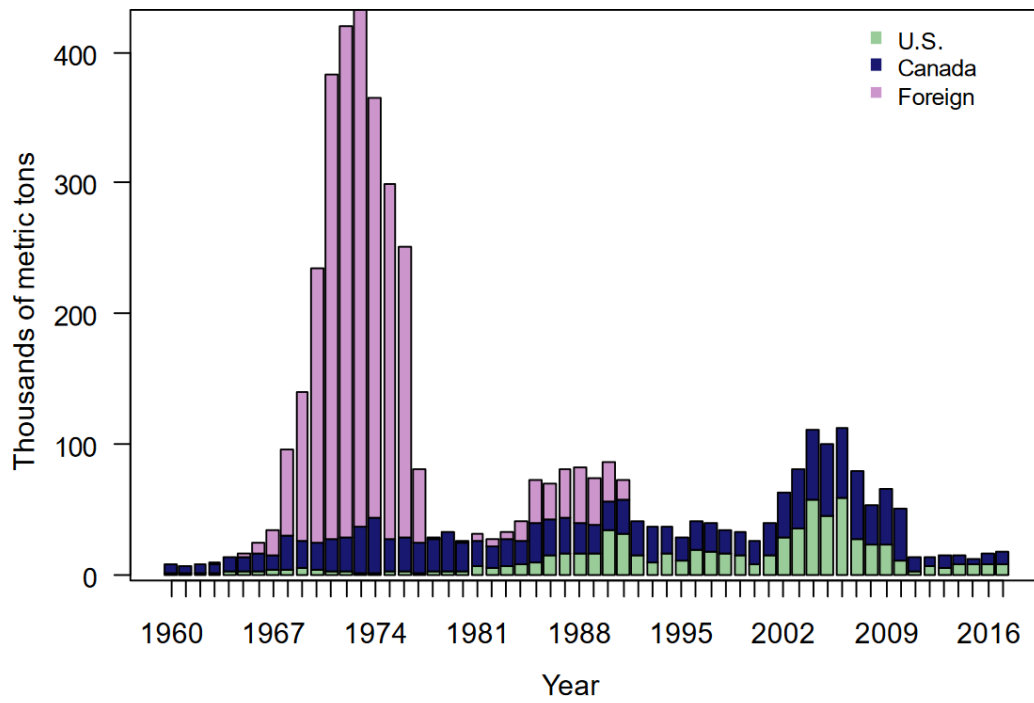
This section updates information on the economic and social importance of the mackerel and herring fisheries. The social importance is generally tied to the economic importance in terms of the jobs that are created in relevant communities. The recent squid and butterfish specifications EA (MAFMC 2017) can be consulted for information on those species, but those fisheries are not expected to be impacted by this action. Recent Amendments to the MSB FMP contain additional information about the MSB fisheries, especially demographic information on ports that land MSB species. See Amendments 11 and 14 at <http://www.mafmc.org/msb/> for more information or visit NMFS' communities page at:

http://www.nefsc.noaa.gov/read/socialsci/community_profiles/. In general, the MSB fisheries saw high foreign landings in the 1970s followed by a domestication of the fishery, and domestic landings have been lower than the peak foreign landings and variable. The current regulations for the MSB fisheries are summarized by NMFS at <https://www.greateratlantic.fisheries.noaa.gov/regs/info.html>, and detailed in the Federal Register at <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=1e9802ffddb05d0243d9c657fade956c&rgn=div5&view=text&node=50:12.0.1.1.5&idno=50>.

6.3.1 Atlantic Mackerel

As illustrated in the figure below, foreign catches were dominant in the early fishery, with total catch peaking at over 430,000 MT in 1973. Foreign catches declined and then were eliminated by the MSA, though there was also some joint venture activity from the mid-1980s through 1991. From 1992 through 2001, total catches averaged only 35,222 MT before increasing to peaks of just over 110,000 MT in 2004 and 2006. Total catch then declined and since 2011 has averaged 14,122 MT. Preliminary estimated 2017 total catch was the highest since 2010 and equaled 17,508 MT. U.S. commercial discards represented an average of 4.2% of U.S. commercial catch over the time series, and 1.7% of commercial catch since 2000. U.S. recreational catch represented an average of 26.4% of total U.S. catch in the 1980's, decreased to an average of 5.2% during the 1990's and 2000's, and has averaged 17.0% since 2010.

Figure 1. Total annual mackerel catch (mt) by the U.S., Canada and other countries for 1960-2017.



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For almost the entire time series, U.S. catches have been well below the limits placed on the fishery, as summarized in the table below.

Table 3. Annual stock-wide ABCs (mt), total catch from all sources (mt) and the proportion of the annual ABC caught.

Year	Stock ABC	Total Catch	Proportion
1995	850,000	28,418	0.03
1996	1,175,500	40,322	0.03
1997	1,178,000	38,920	0.03
1998	382,000	34,376	0.09
1999	383,000	31,998	0.08
2000	369,000	25,338	0.07
2001	369,000	39,364	0.11
2002	369,000	62,962	0.17
2003	369,000	80,311	0.22
2004	369,000	111,377	0.30
2005	335,000	99,603	0.30
2006	335,000	112,425	0.34
2007	238,000	79,733	0.34
2008	211,000	53,008	0.25
2009	211,000	65,676	0.31
2010	211,000	49,648	0.24
2011	80,000	13,147	0.16
2012	80,000	12,601	0.16
2013	80,000	14,360	0.18
2014	80,000	13,971	0.18
2015	40,165	11,950	0.30
2016	19,898	15,316	0.77
2017	19,898	17,508	0.88

The figures below show ex-vessel revenues (nominal) and ex-vessel prices (inflation adjusted) for mackerel from 1982-2017 based on dealer data from the Northeast Commercial Fisheries Database.

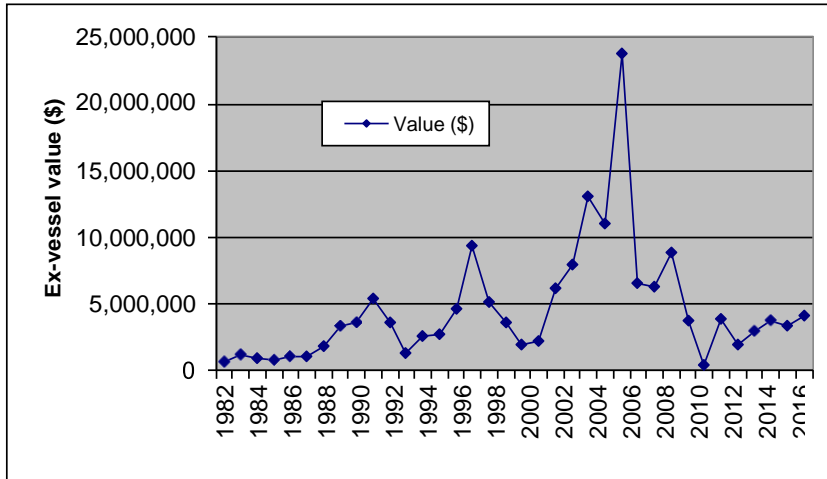


Figure 2. Nominal Ex-Vessel Revenues for mackerel landings during 1982-2017.

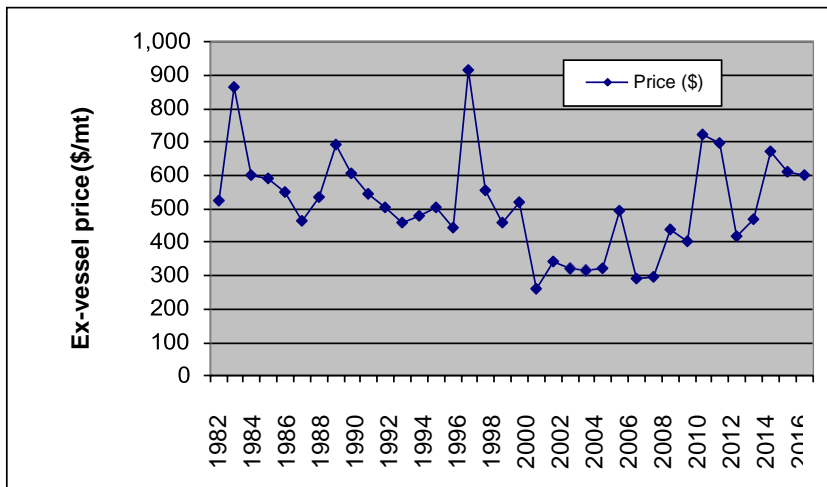


Figure 3. Inflation-adjusted ex-vessel Prices for mackerel landings during 1982-2017.

The mackerel fishery takes place in shelf waters as described in the figures below. Landings for all gears other than paired midwater trawl (e.g. bottom trawl, handgear/jigging, etc.) were reported via dealer reports matched to a vessel trip report (VTR) when possible (only VTR for 2017). Landings for paired midwater trawl vessels were reported via VTRs. From 2007-2011 80% of landings had location data, from 2012-2016 84% of landings had location information, and in 2017 99% of VTR reports had location information.

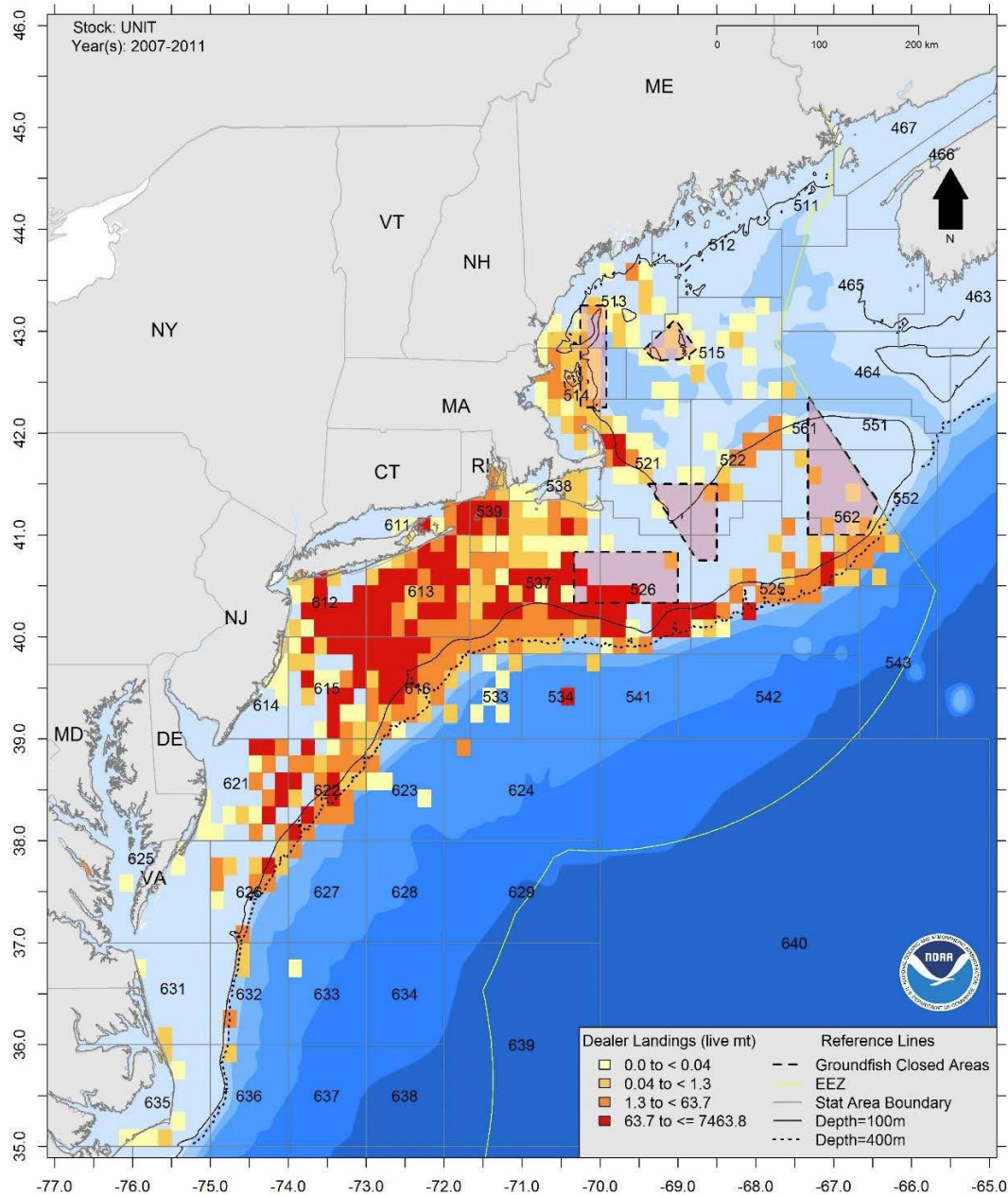


Figure 4. Spatial distribution of landings (mt) by ten-minute square, during 2007-2011.

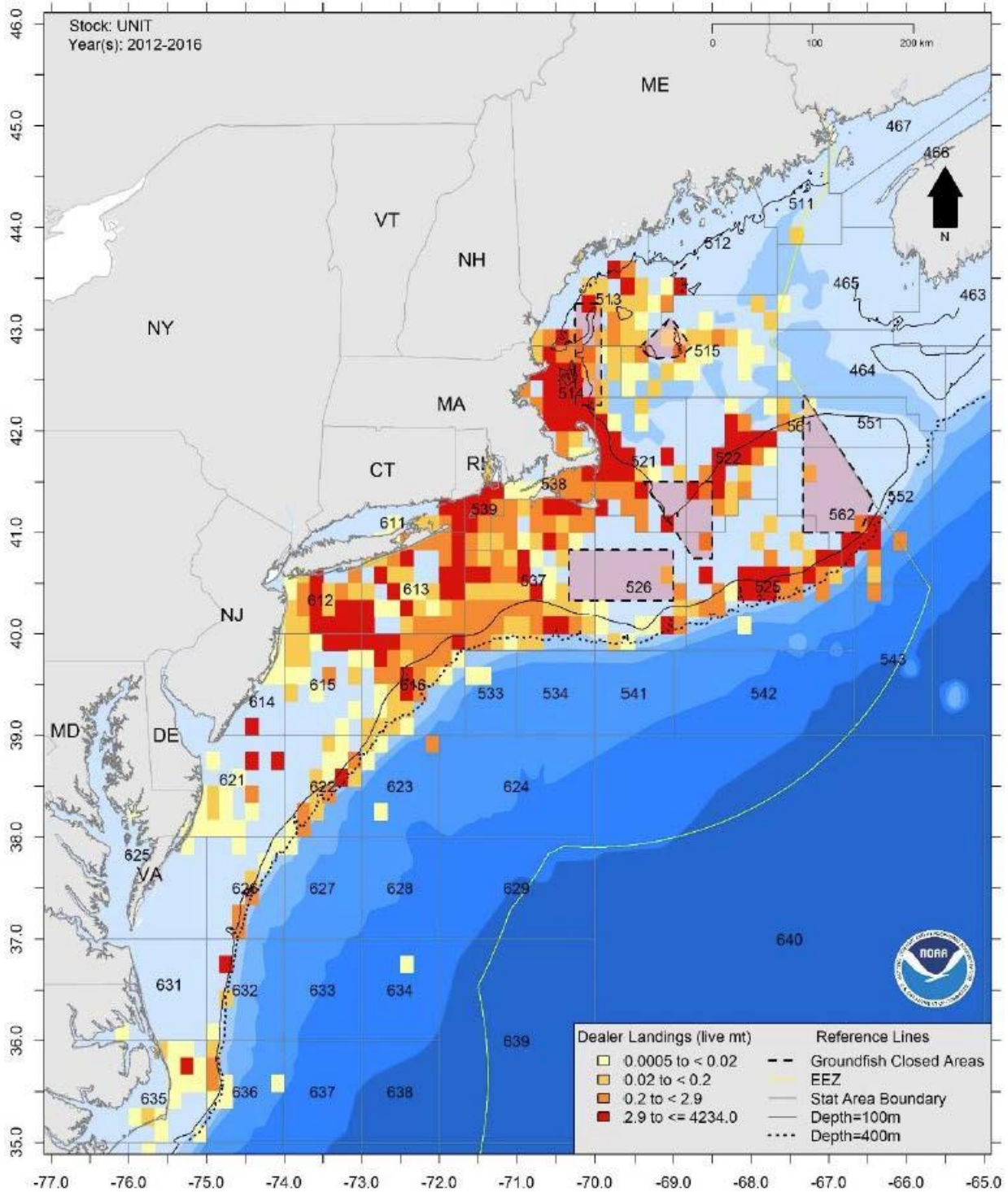


Figure 5. Spatial distribution of landings (mt) by ten-minute square, during 2012-2016.

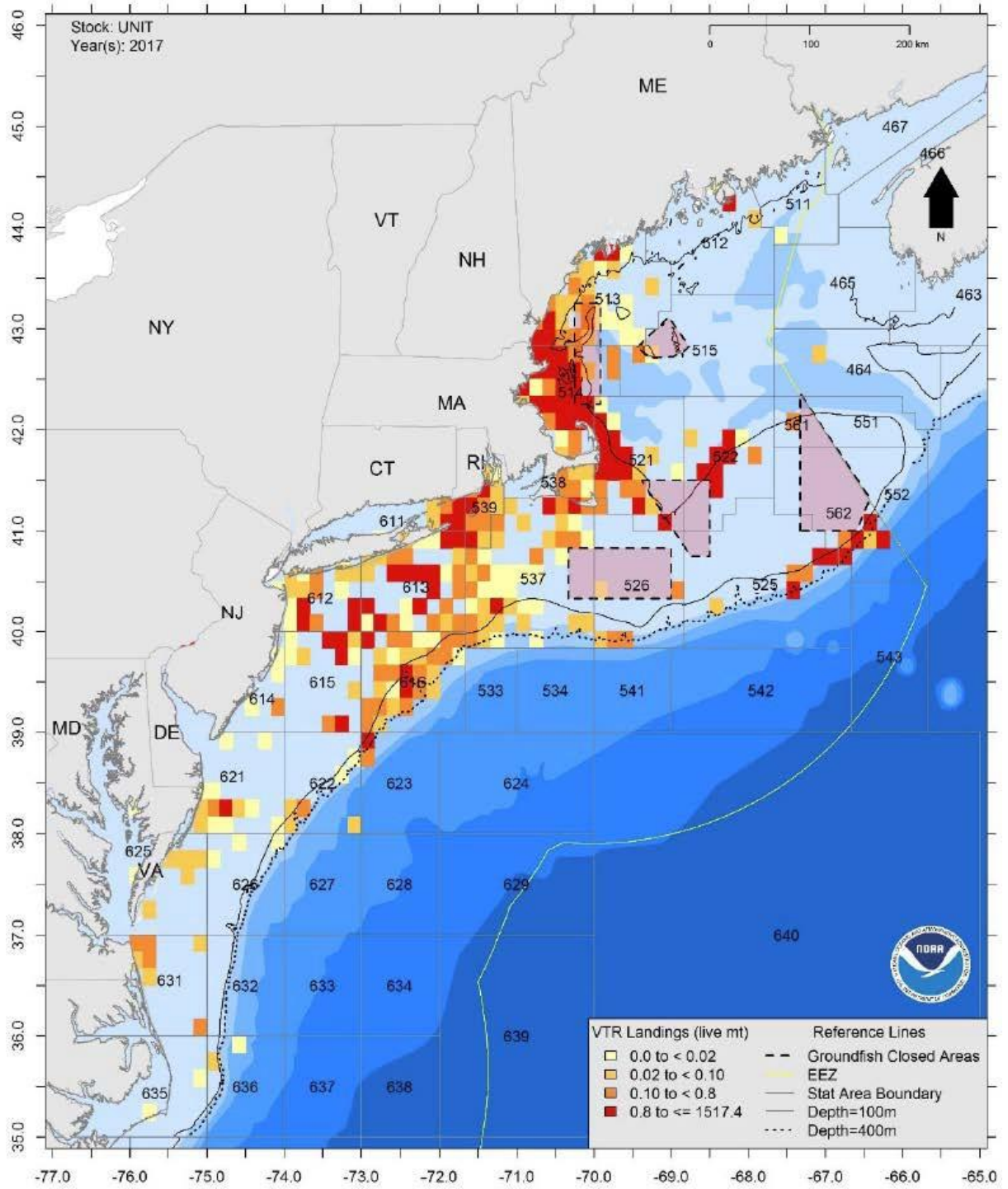


Figure 6. Spatial distribution of landings (mt) by ten-minute square, during 2017.

In recent years most mackerel landings have occurred in Massachusetts and New Jersey (see table below). Further breakdowns of landings by port may violate the spirit of data confidentiality rules. The subsequent table describes the numbers of vessels that have fished for mackerel over time.

Table 4. Recent Mackerel Landings by State (mt)

YEAR	MA	NJ	RI	ME	NY	Other	Total
2015	3,175	1,006	865	510	35	26	5,591
2016	4,833	139	519	169	21	7	5,681
2017	4,710	1,275	315	633	28	13	6,962

Table 5. Numbers of vessels that actively fished for mackerel, by landings (lbs) category, during 1982-2017.

YEAR	Vessels 1 mil +	Vessels 100, 000 - 1mil	Vessels 50, 000 - 100, 000	Vessels 10, 000 - 50, 000	Total
1982	0	10	10	43	63
1983	0	10	5	26	41
1984	0	11	14	29	54
1985	0	12	10	28	50
1986	1	10	5	37	53
1987	1	15	8	31	55
1988	2	20	8	40	70
1989	6	17	8	27	58
1990	6	16	7	39	68
1991	13	18	1	38	70
1992	9	17	13	48	87
1993	0	16	11	55	82
1994	2	27	14	44	87
1995	4	24	11	50	89
1996	7	45	15	53	120
1997	6	30	20	46	102
1998	9	16	6	39	70
1999	6	15	9	36	66
2000	5	3	0	26	34
2001	5	3	2	20	30
2002	12	3	1	22	38
2003	14	6	5	23	48
2004	18	6	1	14	39
2005	16	12	4	15	47
2006	21	12	5	10	48
2007	16	12	2	20	50
2008	15	5	1	17	38
2009	15	6	6	18	45
2010	10	9	2	13	34
2011	0	3	3	17	23
2012	3	9	1	9	22
2013	4	3	3	13	23
2014	6	5	1	13	25
2015	5	9	10	12	36
2016	3	16	7	26	52
2017	6	7	14	28	55

Recreational harvest has been variable without much trend over the 1981-2017 Marine Recreational Information Program (MRIP) time series. In recent years most fish have been caught in New England states' waters (primarily Massachusetts, Maine, and New Hampshire) in May-October (see figure below). Pending revisions to this time series will be incorporated into the next assessment update.

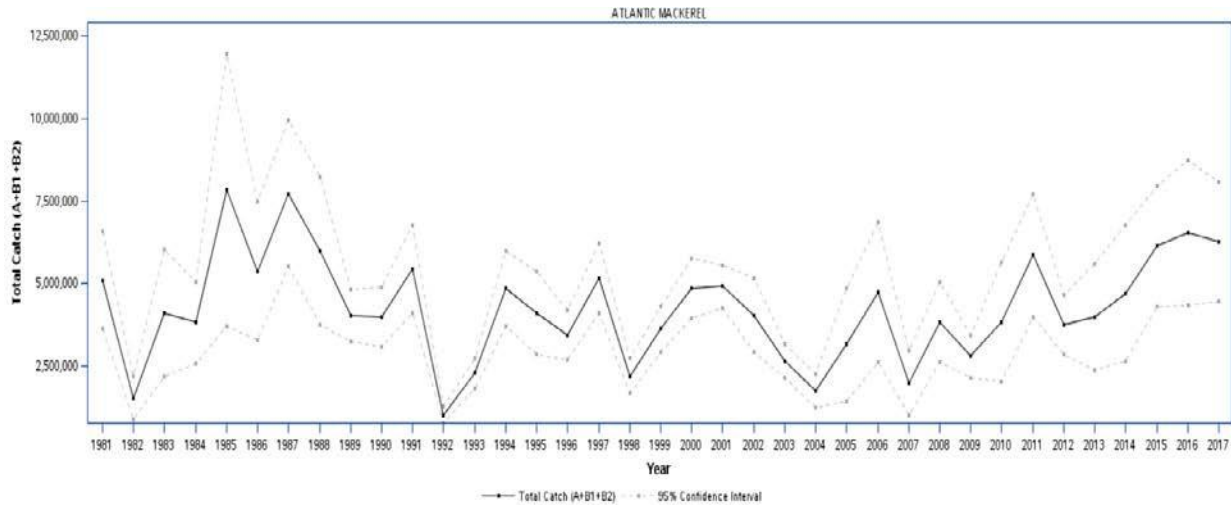


Figure 7. MRIP mackerel time series 1981-2017, total catch, numbers of fish.

6.3.2 Atlantic Herring

Detailed information on the herring fishery can be found in the most recent specifications Environmental Assessment (NEFMC 2016). Atlantic herring landings have been variable in the last decade, averaging about 90,000 mt, with the highest amount in 2009 (about 104,000 mt) and lowest in 2017 (about 50,000 mt). The herring fishery uses predominantly single and paired mid water trawl, bottom trawl, purse seine, and to a lesser extent, gillnet gear throughout the entire range. Most landings are by midwater trawl gear (about 70%), followed by purse seine gear used exclusively in the Gulf of Maine (about 25%), and from bottom trawl gear (5-10%). The average dockside price of herring has increased over the last decade, from \$238 per mt in 2007 to \$552 per mt in 2017. Total revenues for the fishery have been above \$20 million dollars per year for some time, peaking above \$30 million in 2013. 40 vessels landed over 10,000 pounds of herring in 2017. Average Nov-Dec landings (of primary concern for this action) for 2015-2017 were worth \$3.3 million.

6.4 PROTECTED SPECIES

Protected species are those afforded protections under the Endangered Species Act (ESA; species listed as threatened or endangered under the ESA) and/or the Marine Mammal Protection Act (MMPA). The table below provides a list of protected species that occur in the affected environment of the MSB fisheries and the potential for the fishery to impact the species, specifically via interactions with gear types primarily used to prosecute the MSB fishery (i.e., mid-water trawl and bottom trawl gear). Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks. Shaded rows indicate species who prefer continental shelf edge/slope waters (i.e., >200 meters). There is some handline/auto-jig fishing for mackerel but it constitutes a minor portion of effort/catch.

Table 6. Species Protected Under the ESA and/or MMPA that May Occur in the Affected Environment of the MSB FMP

Species	Status ²	Observed/documentated interactions with bottom trawl and/or mid-water trawl gear?
Cetaceans		
<i>North Atlantic right whale (Eubalaena glacialis)</i>	<i>Endangered</i>	<i>No</i>
Humpback whale, West Indies DPS, (<i>Megaptera novaeangliae</i>)	Protected (MMPA)	No
<i>Fin whale (Balaenoptera physalus)</i>	<i>Endangered</i>	<i>No</i>
<i>Sei whale (Balaenoptera borealis)</i>	<i>Endangered</i>	<i>No</i>
<i>Blue whale (Balaenoptera musculus)</i>	<i>Endangered</i>	<i>No</i>
<i>Sperm whale (Physeter macrocephalus)</i>	<i>Endangered</i>	<i>No</i>
Minke whale (<i>Balaenoptera acutorostrata</i>)	Protected (MMPA)	Yes
<i>Pilot whale (Globicephala spp.)³</i>	<i>Protected (MMPA)</i>	<i>Yes</i>
Pygmy sperm whale (<i>Kogia breviceps</i>)	Protected (MMPA)	No
Dwarf sperm whale (<i>Kogia sima</i>)	Protected (MMPA)	No
Risso's dolphin (<i>Grampus griseus</i>)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	Protected (MMPA)	Yes
Short Beaked Common dolphin (<i>Delphinus delphis</i>)	Protected (MMPA)	Yes
Atlantic Spotted dolphin (<i>Stenella frontalis</i>)	Protected (MMPA)	No
Striped dolphin (<i>Stenella coeruleoalba</i>)	Protected (MMPA)	No
Beaked whales (<i>Ziphius and Mesoplodon spp.</i>) ⁴	Protected (MMPA)	No
<i>Bottlenose dolphin (Tursiops truncatus)</i> ⁵	<i>Protected (MMPA)</i>	<i>Yes</i>
Harbor porpoise (<i>Phocoena phocoena</i>)	Protected (MMPA)	Yes
Pinnipeds		
Harbor seal (<i>Phoca vitulina</i>)	Protected (MMPA)	Yes
Gray seal (<i>Halichoerus grypus</i>)	Protected (MMPA)	Yes

Species	Status ²	Observed/documentated interactions with bottom trawl and/or mid-water trawl gear?
Harp seal (<i>Phoca groenlandicus</i>)	Protected (MMPA)	Yes
Hooded seal (<i>Cystophora cristata</i>)	Protected (MMPA)	No
Sea Turtles		
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered	Yes
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)	Endangered	Yes
Green sea turtle, North Atlantic DPS (<i>Chelonia mydas</i>)	Threatened	Yes
Loggerhead sea turtle (<i>Caretta caretta</i>), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (<i>Eretmochelys imbricate</i>)	Endangered	No
Fish		
Atlantic salmon	Endangered	Yes
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (<i>Brosme brosme</i>)	Candidate	Yes
Alewife (<i>Alosa pseudoharengus</i>)	Candidate	Yes
Blueback herring (<i>Alosa aestivalis</i>)	Candidate	Yes
Critical Habitat		
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA (Protected)	No
North Atlantic Right Whale Critical Habitat	ESA (Protected)	No
<p><i>Notes:</i></p> <p>¹ A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3 of the MMPA of 1972).</p> <p>² Status is defined by whether the species is listed under the ESA as endangered (i.e. at risk of extinction) or threatened (i.e. at risk of endangerment), or protected under the MMPA. Marine mammals listed under the ESA are also protected under the MMPA. Candidate species are those species for which ESA listing may be warranted.</p> <p>³ There are 2 species of pilot whales: short finned (<i>G. melas melas</i>) and long finned (<i>G. macrorhynchus</i>). Due to the difficulties in identifying the species at sea, they are often referred to as <i>Globicephala spp.</i></p> <p>⁴ There are multiple species of beaked whales in the Northwest Atlantic. They include the cuvier's (<i>Ziphius cavirostris</i>), blainville's (<i>Mesoplodon densirostris</i>), gervais' (<i>Mesoplodon europaeus</i>), sowerbys' (<i>Mesoplodon bidens</i>), and trues' (<i>Mesoplodon mirus</i>) beaked whales. Species of <i>Mesoplodon</i> are difficult to identify at sea, therefore, much of the available characterization for beaked whales is to the genus level only.</p> <p>⁵ This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.</p>		

Cusk, alewife, and blueback herring are NMFS "candidate species" under the ESA. Candidate species are those petitioned species for which NMFS has determined that listing may be warranted under the ESA and those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. If a species is proposed for listing the conference provisions under Section 7 of the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, these species will not be discussed further in this and the following sections; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed action. Additional information on cusk, alewife, and blueback herring can be found at:

<https://www.fisheries.noaa.gov/endangered-species-conservation/candidate-species-under-endangered-species-act>.

6.4.1. Protected Species and Critical Habitat Not Likely to be Affected (via interactions with gear or destruction of essential features of critical habitat) by the MSB fisheries

Based on available information, it has been determined that this action is not likely to affect (via interactions with gear or destruction of essential features of critical habitat) some ESA listed and/or marine mammal protected species or their designated critical habitat (see Table 6). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or there have never been documented interactions between the species and the primary gear type used to prosecute the MSB fisheries (i.e., bottom otter and mid-water trawls); <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>; NMFS NEFSC FSB 2015, 2016, 2017; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html). In the case of critical habitat, this determination has been made because operation of the MSB fisheries will not affect the essential physical and biological features of North Atlantic right whale or loggerhead (NWA DPS) critical habitat and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2014; NMFS 2015a,b).

6.4.2. Protected Species Potentially Affected by the Proposed Action

Table 6 also provides a list of protected species of sea turtle, marine mammal, and fish species present in the affected environment of the MSB fishery, and that may also be affected by the operation of this fishery; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute the fishery. To aid in the identification of MMPA protected species potentially affected by the action, the MMPA List of Fisheries and marine mammal stock assessment reports for the Atlantic Region were referenced (<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries>). To aid in identifying ESA listed species potentially affected by the action, the 2013 Biological Opinion issued by NMFS on the

operation of seven commercial fisheries, including the MSB FMP, and its impact on ESA listed species was referenced (NMFS 2013) was referenced. The 2013 Opinion, which considered the best available information on ESA listed species and observed or documented ESA listed species interactions with gear types used to prosecute the 7 FMPs (e.g., gillnet, bottom trawl, and pot/trap), concluded that the seven fisheries may adversely affect, but was not likely to jeopardize the continued existence of any ESA listed species. The Opinion included an incidental take statement (ITS) authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon. Reasonable and prudent measures and terms and conditions were also issued with the ITS to minimize impacts of any incidental take.

Up until recently, the 2013 Opinion remained in effect; however, new information on North Atlantic right whales has been made available that may reveal effects of the fisheries analyzed in the 2013 Opinion that may not have been previously considered. As a result, per an October 17, 2017, ESA 7(a)(2)/7(d) memo issued by NMFS, the 2013 Opinion has been reinitiated. However, the October 17, 2017, memo concludes that allowing these fisheries to continue during the reinitiation period will not increase the likelihood of interactions with ESA listed species above the amount that would otherwise occur if consultation had not been reinitiated, and therefore, the continuation of these fisheries during the reinitiation period would not be likely to jeopardize the continued existence of any ESA listed species. Until replaced, the MSB FMP is currently covered by the incidental take statement authorized in NMFS 2013 Opinion.

As the primary concern for both MMPA protected and ESA listed species is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types, in order to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the MSB FMP is provided below, while information on protected species interactions with specific fishery gear is provided in section 6.4.3.

6.4.2.1. Sea Turtles

This section contains a brief summary of the occurrence and distribution of sea turtles in the affected environment of the MSB fisheries. Additional background information on the range-wide status of affected sea turtles species, as well as a description and life history of each of these species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; TEWG 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant et al. 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS et al. 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

Hard-shelled sea turtles: In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill et al. 2008; Braun & Epperly 1996; Epperly et al. 1995a,b; Mitchell et al. 2003; Shoop & Kenney 1992; TEWG 2009; Blumenthal et al. 2006; Braun-McNeill & Epperly 2004; Griffin et al. 2013; Hawkes et al. 2006; Hawkes et al. 2011; Mansfield et al. 2009; McClellan & Read 2007; Mitchell et al. 2003; Morreale & Standora 2005). As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2004; Epperly et al. 1995a,b,c; Griffin et al. 2013; Morreale & Standora 2005), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the Gulf of Maine (GOM) in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The majority leave the Gulf of Maine by September, but some remain in Mid-Atlantic and Northeast areas until November. By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly et al. 1995b; Griffin et al. 2013; Hawkes et al. 2011; Shoop & Kenney 1992).

Leatherback sea turtles: Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (James et al. 2005; Eckert et al. 2006; Murphy et al. 2006; NMFS and USFWS 2013; Dodge et al. 2014). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (NMFS and USFWS 1992; James et al. 2005; James et al. 2006; Dodge et al. 2014). They are found in more northern waters (i.e., Gulf of Maine) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (James et al. 2005; James et al. 2006; Dodge et al. 2014).

6.4.2.2. Large Whales

Multiple species of whales occur in the Northwest Atlantic, with the minke whale being the only whale species potentially affected by the proposed action. In general, large whales, such as minke whales, follow an annual pattern of migration between low latitude (south of 35°N) wintering/calving grounds and high latitude spring/summer foraging grounds (primarily north of 41°N; Hayes et al. 2018; NMFS 1991, 2005, 2010b, 2011a, 2012b). This, however, is a simplification of whale movements, particularly as it relates to winter movements. It remains unknown if all individuals of a population migrate to low latitudes in the winter, although, increasing evidence suggests that for some species (e.g. right and humpback whales), some portion of the population remains in higher latitudes throughout the winter (Hayes et al. 2017; Khan et al. 2009, 2010, 2011, 2012; Brown et al. 2002; NOAA 2008; Cole et al. 2013; Clapham et al. 1993; Swingle et al. 1993; Vu et al. 2012). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the distribution and movements of large whales to foraging grounds in the spring/summer is well understood. Movements of whales into higher latitudes coincide with peak productivity in these waters. As a result, the distribution of large whales in higher latitudes is strongly governed by prey availability and distribution, with large numbers of whales coinciding with dense patches of preferred forage (Mayo and Marx 1990; Kenney et al. 1986, 1995; Baumgartner et al. 2003; Baumgartner and Mate 2003; Payne et al. 1986, 1990; Brown et al. 2002; Kenney and Hartley 2001; Schilling et al. 1992). For additional information on the biology, status, and range wide distribution of whale species, such

as the minke whale, please refer to marine mammal stock assessment reports provided at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>.

6.4.2.3. Small Cetaceans and Pinnipeds

Table 7 lists the small cetaceans and pinnipeds that may occur in the affected environment of the MSB fisheries. Small cetaceans can be found throughout the year in the Northwest Atlantic Ocean; however, within this range, there are seasonal shifts in species distribution and abundance. Pinnipeds are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N). For additional information on the biology and range wide distribution of each species of small cetacean and pinniped provided in Table 7 please refer to the marine mammal stock assessment reports provided at: <http://www.nmfs.noaa.gov/pr/sars/region.htm>.

6.4.2.4. Atlantic Sturgeon

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (ASSRT 2007; Dovel and Berggren 1983; Dadswell et al. 1984; Kynard et al. 2000; Stein et al. 2004a; Dadswell 2006; Laney et al. 2007; Dunton et al. 2010, 2015; Erickson et al. 2011; Wirgin et al. 2012; Waldman et al. 2013; O’Leary et al. 2014; Wirgin et al. 2015a,b; ASMFC 2017). Based on fishery-independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein et al. 2004 a,b; Erickson et al. 2011; Dunton et al. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein et al. 2004a,b; Dunton et al. 2010; Erickson et al. 2011). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon may undertake seasonal movements along the coast (Dunton et al. 2010; Erickson et al. 2011; Wipplehauser 2012); however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year. For additional information on the biology, status, and range wide distribution of each distinct population segment (DPS) of Atlantic sturgeon please refer to 77 FR 5880 and 77 FR 5914, as well as the Atlantic Sturgeon Status Review Team’s (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007) and the Atlantic States Marine Fisheries Commission 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017).

6.4.2.5 Atlantic Salmon

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the Gulf of Maine DPS extends from the Gulf of Maine (primarily northern portion of the Gulf of Maine) to the coast of Greenland (NMFS and USFWS 2005, 2016; Fay *et al.* 2006). In general, smolts, post-smolts, and adult

Atlantic salmon may be present in the Gulf of Maine and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay *et al.* 2006; USASAC 2004; Hyvarinen *et al.* 2006; Lacroix and McCurdy 1996; Lacroix *et al.* 2004, 2005; Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993, Sheehan *et al.* 2012; NMFS and USFWS 2005, 2016; Fay *et al.* 2006). For additional information on the on the biology, status, and range-wide distribution of the Gulf of Maine DPS of Atlantic salmon please refer to NMFS and USFWS 2005, 2016; Fay *et al.* 2006.

6.4.3. Gear Interactions with Protected Species

Several protected species are vulnerable to interactions with various types of fishing gear. Interaction risks vary by gear type, quantity, and soak or tow time. Available information on gear interactions with a given protected species (or species group) is provided in the sections below. These sections are not a comprehensive review of all fishing gear types known to interact with a given species; focus is placed on interaction risks associated with bottom trawls or midwater trawls, the primary gear types used in the MSB fisheries.

6.4.3.1. Gear Interactions with Sea Turtles

Bottom Otter Trawl

Sea turtle interactions with bottom trawl gear have been observed on Georges Bank, and in the Mid-Atlantic; however, most of the observed interactions have occurred in the Mid-Atlantic (Warden 2011a,b; Murray 2015). As no sea turtle interactions with bottom trawl gear have been observed in the Gulf of Maine, and few sea turtle interactions have been observed on Georges Bank, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with bottom trawl gear in these regions or produce a bycatch estimate for these regions. As a result, the bycatch estimates and discussion below are for bottom trawl gear in the Mid-Atlantic.

Bottom trawl gear poses an injury and mortality risk to sea turtles, specifically due to forced submergence (Sasso and Epperly 2006). Green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles have been documented interacting (e.g., bycaught) with bottom trawl gear. However, estimates are available only for loggerhead sea turtles. Warden (2011a,b) estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic¹ was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but released through a Turtle Excluder Device (TED).² The 292 average annual observable loggerhead interactions equates to

¹ Warden (2011a) defined the Mid-Atlantic as south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border.

² TEDs allow sea turtles to escape the trawl net, reducing injury and mortality resulting from capture in the net. Approved TEDs are required in the shrimp and summer trawl fishery. For further information on TEDs see 50 CFR 223.206 and 68 FR 8456 (February 21, 2003).

approximately 44 adult equivalents (Warden 2011a,b). Most recently, Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic³ was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents (Murray 2015). Bycatch estimates provided in Warden (2011a) and Murray (2015) are a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated at 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a, b).

Mid-Water Trawl

NEFOP and ASM observer data from 1989 to 2016 show five leatherback sea turtle interactions with mid-water trawl gear; the primary species landed during these interactions was tuna (NMFS NEFSC FSB 2015, 2016, 2017). These takes were in the early 1990s in an experimental HMS fishery that no longer operates. No takes have been documented in other mid-water trawl fisheries operating in the Greater Atlantic Region. Based on this and the best available information, sea turtle interactions in mid-water trawl gear in the Greater Atlantic Region are expected to be rare.

6.4.3.2. Gear Interactions with Atlantic Sturgeon

Bottom Otter Trawl

Atlantic sturgeon interactions (i.e., bycatch) with bottom trawl gear have been observed since 1989; these interactions have the potential to result in the injury or mortality of Atlantic sturgeon (NMFS NEFSC FSB 2015, 2016, 2017). Three documents, covering three time periods, that use data collected by the Northeast Fisheries Observer Program to describe bycatch of Atlantic sturgeon in bottom trawl gear: Stein et al. (2004b) for 1989-2000; ASMFC (2007b) for 2001-2006; and Miller and Shepard (2011) for 2006-2010; none of these documents provide estimates of Atlantic sturgeon bycatch by Distinct Population Segment. Miller and Shepard (2011), the most recent of the three documents, analyzed fishery observer data and VTR data in order to estimate the average annual number of Atlantic sturgeon interactions in otter trawl in the Northeast Atlantic that occurred from 2006 to 2010. This timeframe included the most recent, complete data and as a result, Miller and Shepard (2011) is considered to represent the most accurate predictor of annual Atlantic sturgeon interactions in the Northeast bottom trawl fisheries (NMFS 2013).

Based on the findings of Miller and Shepard (2011), NMFS (2013) estimated that the annual bycatch of Atlantic sturgeon in bottom trawl gear to be 1,342 sturgeon. Miller and Shepard

³ Murray 2015b defined the Mid-Atlantic as the boundaries of the Mid-Atlantic Ecological Production; roughly waters west of 71°W to the North Carolina/South Carolina border)

(2011) reported observed Atlantic sturgeon interactions in trawl gear with small (< 5.5 inches) and large (≥ 5.5 inches) mesh sizes and concluded that, based on NEFOP observed sturgeon mortalities, relative to gillnet gear, bottom trawl gear posed less risk of mortality to Atlantic sturgeon. Estimated mortality rates in gillnet gear were 20.0%, while those in otter trawl gear were 5.0% (Miller and Shepard 2011; NMFS 2013). Similar conclusions were reached in Stein *et al.* (2004b) and ASMFC (2007b) reports; after review of observer data from 1989-2000 and 2001-2006, both studies concluded that observed mortality is much higher in gillnet gear than in trawl gear. However, an important consideration to these findings is that observed mortality is considered a minimum of what actually occurs and therefore, the conclusions reached by Stein *et al.* (2004b), ASMFC (2007b), and Miller and Shepard (2011) are not reflective of the total mortality associated with either gear type. To date, total Atlantic sturgeon mortality associated with gillnet or trawl gear remains uncertain.

Mid-Water Trawl

To date, there have been no observed/documentated interactions with Atlantic sturgeon in mid-water trawl gear (NMFS NEFSC FSB 2015, 2016, 2017). Based on this information, mid-water trawl gear is not expected to pose an interaction risk to any Atlantic sturgeon and therefore, is not expected to be source of injury or mortality to this species.

6.4.3.3. Gear Interaction with Atlantic Salmon

Bottom Otter Trawl

Atlantic salmon interactions (i.e., bycatch) with bottom trawl have been observed since 1989; in many instances, these interactions have resulted in the injury and mortality of Atlantic salmon (NMFS NEFSC FSB 2015, 2016, 2017). According to the Biological Opinion issued by NMFS Greater Atlantic Regional Fisheries Office on December 16, 2013, NMFS Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer and At-Sea Monitoring Programs documented a total of 15 individual salmon incidentally caught on more than 60,000 observed commercial fishing trips from 1989 through August 2013 (NMFS 2013; Kocik *et al.* 2014); of those 15 salmon, four were observed caught in bottom trawl gear (Kocik (NEFSC), pers. comm (February 11, 2013) in NMFS 2013). The genetic identity of these captured salmon is unknown; however, the NMFS 2013 Biological Opinion considers all 15 fish to be part of the Gulf of Maine Distinct Population Segment, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts). Since 2013, no additional Atlantic salmon have been observed in bottom trawl gear (NMFS NEFSC FSB 2015, 2016, 2017). Based on the above information, bottom trawl interactions with Atlantic salmon are likely rare (NMFS 2013; Kocik *et al.* 2014).

Mid-Water Trawl

To date, there have been no observed/documentated interactions with Atlantic salmon and mid-water trawl gear (NMFS NEFSC FSB 2015, 2016, 2017). Based on this information, mid-water trawls or purse seines are not expected to pose an interaction risk to any Atlantic salmon and therefore, are not expected to be source of injury or mortality to this species.

6.4.3.4. Gear Interactions with Marine Mammals

Depending on species, marine mammal interactions have been observed in bottom trawl, purse seine, and/or mid-water trawl gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2018 LOF (83 FR 5349 (February 7, 2018)) categorizes the commercial MSB fisheries, which are primarily prosecuted with bottom and mid-water trawl gears, as a Category II bottom trawl (Northeast and Mid-Atlantic) or Category II mid-water (Northeast and Mid-Atlantic) fishery.

Large Whales

Bottom Otter and Mid-Water Trawls

With the exception of one species, there have been no observed interactions with large whales and trawl (bottom or mid-water) gear. The one exception is minke whales, which have been observed seriously injured and killed in both types of trawl gear. Over the past 10 years, there have been two (2) observed minke whales incidentally taken in mid-water trawl gear. These occurred in 2009 and 2013, with the 2009 incident resulting from entanglement in NOAA research mid-water trawl gear (whale released alive, but seriously injured), and the 2013 incident resulting from entanglement in a Northeast mid-water trawl (including pair trawl) fishery (whale was dead, moderately decomposed) (see http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html; Waring *et al.* 2016; Henry *et al.* 2015). Based on the latter incident, as provided in Waring *et al.* (2016), the estimated annual average minke whale mortality and serious injury from the Northeast mid-water trawl (including pair trawl) fishery from 2009 to 2013 is 0.2; Hayes *et al.* (2017) provided the same estimated annual average minke whale mortality and serious injury from 2010 to 2014 for this fishery. Most recently, based on information provided by Henry *et al.* (2017), Hayes *et al.* (2018) estimated the annual average minke whale mortality and serious injury from the Northeast mid-water trawl (including pair trawl) fishery from 2011 to 2015 to be zero.

In bottom trawl gear, to date, interactions have only been observed in the northeast bottom trawl fisheries. From the period of 2008-2012, the estimated annual mortality attributed to this fishery was 7.8 minke whales for 2008 and zero minke whales from 2009-2012; no serious injuries were reported during this time (Waring *et al.* 2015). Based on this information, from 2008-2012, the estimated annual average minke whale mortality and serious injury attributed to the northeast bottom trawl fishery was 1.6 (CV=0.69) whales (Waring *et al.* 2015). Lyssikatos (2015)

estimated that from 2008-2013, mean annual serious injuries and mortalities from the northeast bottom trawl fishery were 1.40 (CV=0.58) minke whales. Serious injury and mortality records for minke whales in U.S. waters from 2010-2015 showed zero interactions with bottom trawl (northeast or Mid-Atlantic) gear (Henry *et al.* 2016; Henry *et al.* 2017; Hayes *et al.* 2017; Hayes *et al.* 2018).

Based on above information, trawl gear is likely to pose a low interaction risk to any large whale species. Should an interaction occur, serious injury or mortality to any large whale is possible; however, relative to other gear types, such as fixed gear, trawl gear represents a low source serious injury or mortality to any large whale (Henry *et al.* 2016; Henry *et al.* 2017; Hayes *et al.* 2017; Hayes *et al.* 2018).

Small Cetaceans and Pinnipeds

Bottom and Mid-Water Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with bottom and/or mid-water trawl gear (Read *et al.* 2006; Lyssikatos 2015; Chavez-Rosales *et al.* 2017; Waring *et al.* 2014a; Waring *et al.* 2015; Waring *et al.* 2016; Hayes *et al.* 2017; Hayes *et al.* 2018; 83 FR 5349 (February 7, 2018)).⁴ Based on the most recent Marine Mammal List of Fisheries (LOF) issued on February 7, 2018 (83 FR 5349), Table 7 provides a list of species that have been observed (incidentally) seriously injured and/or killed by List of Fisheries Category II trawl fisheries that operate in the affected environment of the MSB fisheries (83 FR 5349 (February 7, 2018)).

Table 7. Small cetacean and pinniped species observed seriously injured and/or killed by Category II trawl fisheries in the affected environment of the MSB fisheries.

Fishery	Category	Species Observed or reported Injured/Killed
Mid-Atlantic Mid-Water trawl (including pair trawl)	II	Gray seal
		Harbor seal
Northeast Midwater Trawl- Including Pair Trawl	II	Short-beaked common dolphin
		Long-finned pilot whales
		Gray seal
		Harbor seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Long-finned pilot whales
		Short-beaked common dolphin
		White-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
Risso's dolphin		
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Short-beaked common dolphin
		Risso's dolphin

⁴ For additional information on small cetacean and pinniped interactions prior to those provided in Waring *et al.* 2014a, see: <http://www.nmfs.noaa.gov/pr/sars/region.htm>

	Bottlenose dolphin (offshore)
	Gray seal
	Harbor seal
<i>Sources:</i> MMPA LOF 83 FR 5349 (February 7, 2018).	

In 2006, based on observed mid-water trawl interactions with long-finned pilot whales, short-finned pilot whales, common dolphins, and white sided dolphins, the Atlantic Trawl Gear Take Reduction Team (ATGTRT) was convened to address the incidental mortality and serious injury of these species incidental to bottom and mid-water trawl fisheries operating in both the New England and Mid-Atlantic regions. Because none of the marine mammal stocks of concern to the ATGTRT are classified as a “strategic stock”, nor do they currently interact with a Category I fishery,⁵ it was determined that development of a take reduction plan was not necessary. In lieu of a take reduction plan, the ATGTRT agreed to develop an Atlantic Trawl Gear Take Reduction Strategy (ATGTRS). The ATGTRS identifies informational and research tasks, as well as education and outreach needs the ATGTRT believes are necessary to provide the basis for decreasing mortalities and serious injuries of marine mammals to insignificant levels approaching zero. The ATGTRS also identifies several voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals.⁶

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⁵ Category I fisheries have frequent incidental mortality and serious injury of marine mammals.

⁶ For additional details on the ATGTRS, visit: <http://www.greateratlantic.fisheries.noaa.gov/Protected/mmp/atgtrp/>

7.0 WHAT ARE THE IMPACTS (Biological and Human Community) FROM THE ALTERNATIVES CONSIDERED IN THIS DOCUMENT?

The alternatives considered are fully described in section 5. A descriptive label is included for each alternative below when considering impacts.

This action is not proposing to change any ACLs, only changes to trip limits once 100% of the commercial mackerel quota (DAH) is caught to allow small scale directed and incidental fishing to occur as has happened in recent years. For habitat, protected resource, and non-target species impacts, the key determinant is not so much the catch itself but the amount and character of the related effort. A decrease in effort may result in positive impacts as a result of fewer encounters and/or fewer habitat impacts from fishing gear, while an increase in effort may result in a negative impact. Similar effort likely results in similar impacts as previous years.

National Oceanic and Atmospheric Administration Administrative Order 216-6A and the Companion Manual contains criteria for determining the significance of the impacts of a proposed action and it includes the possibility of introducing or spreading a nonindigenous species. This potential impact does not fit into the sections below so it is addressed in this introduction. There is no evidence or indication that these fisheries have ever resulted or would ever result in the introduction or spread of nonindigenous species.

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Environmental impacts are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). The table below summarizes the guidelines used for each Valued Ecosystem Component (VEC) to determine the magnitude and direction of the impacts described in this section.

Table 8. General definitions for impacts and qualifiers relative to resource condition (i.e., baselines)

General Definitions				
VEC	Resource Condition	Impact of Action		
		Positive (+)	Negative (-)	No Impact (0)
Target and non-target Species	Overfished status defined by the MSA	Alternatives that maintain or are projected to result in a stock status above an overfished condition*	Alternatives that maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed protected species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (i.e., no take)	Alternatives that result in interactions/take of listed species, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA protected species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammals that could result in takes above PBR	Alternatives that do not impact MMPA protected species
Physical environment / habitat / EFH	Many habitats degraded from historical effort and slow recovery time (see condition of the resources table)	Alternatives that improve the quality or quantity of habitat or allow for recovery	Alternatives that degrade the quality/quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human communities (socioeconomic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
Impact Qualifiers				
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible		To such a small degree to be indistinguishable from no impact	
	Slight (sl), as in slight positive or slight negative		To a lesser degree / minor	
	Moderate (M) positive or negative		To an average degree (i.e., more than "slight", but not "high")	
	High (H), as in high positive or high negative		To a substantial degree (not significant unless stated)	
	Significant (in the case of an EIS)		Affecting the resource condition to a great degree, see 40 CFR 1508.27.	
	Likely		Some degree of uncertainty associated with the impact	
*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact analysis.				

The table below summarizes the baseline conditions of the VECs considered in this action, as described in Section 6.

Table 9. Summary Baseline conditions of VECs considered in this action

VEC		Baseline Condition	
		Status/Trends, Overfishing?	Status/Trends, Overfished?
Target stocks (section 6.1)	Atl. mackerel	Yes through 2016, projected to be below overfishing threshold in 2017 and beyond.	Yes in 2016. Projected to be above overfished threshold in 2018 and beyond. A rebuilding program is being developed.
	Butterfish	No	No
	Longfin Squid	Unknown, believed lightly exploited.	No
	Illex Squid	Unknown	Unknown, NEFSC fall bottom trawl surveys are highly variable and without trend
Non-target species (principal species listed in section 6.1)	silver hake	no	no
	spiny dogfish	no	no
	alewife	Unknown	depleted
	blueback herring	Unknown	depleted
	American shad	Unknown	depleted
	haddock	no	no
	red hake	yes	yes
	winter (big) skate	no	no
john dory buckler	Unknown	Unknown	
Habitat (section 6.2)		Commercial fishing impacts are complex and variable and typically adverse; Recreational fishing impacts are typically minimal. Non-fishing activities had historically negative but site-specific effects on habitat quality.	
Protected resources (section 6.4)	Sea turtles	Leatherback and Kemp's ridley sea turtles are classified as endangered under the ESA; loggerhead (NW Atlantic DPS) and green (North Atlantic DPS) sea turtles are classified as threatened.	
	Fish	Atlantic salmon, shortnose sturgeon, and the New York Bight, Chesapeake, Carolina, and South Atlantic DPSs of Atlantic sturgeon are classified as endangered under the ESA; the Atlantic sturgeon Gulf of Maine DPS is listed as threatened; cusk, alewife, and blueback herring are candidate species	
	Large whales	All large whales in the Northwest Atlantic are protected under the MMPA. North Atlantic right, fin, blue, sei, and sperm whales are also listed as endangered under the ESA. Pursuant to section 118 of the MMPA, the Large Whale Take Reduction Plan was implemented to reduce humpback, North Atlantic right, and fin	

		whale entanglement in vertical lines associated with fixed fishing gear (sink gillnet and trap/pot) and sinking groundlines.
	Small cetaceans	Pilot whales, dolphins, and harbor porpoise are all protected under the MMPA. Pursuant to section 118 of the MMPA, the HPTRP and BDTRP was implemented to reduce bycatch of harbor porpoise and bottlenose dolphin stocks, respectively, in gillnet gear.
	Pinnipeds	Gray, harbor, hooded, and harp seals are protected under the MMPA.
Human communities (section 6.3)		The MSB stocks support substantial fisheries and related support services.

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7.1 Managed Resources

7.1.1 Impacts on Mackerel

Current resource condition: A recent assessment found the mackerel stock to be overfished with overfishing occurring in the terminal year of the assessment (2016). However, good recruitment in 2016 from the 2015 year class, combined with the already-lowered US and Canadian quotas appear to have set up the mackerel stock for rapid rebuilding. As is normal for assessments and projections, the terminal recruitment year-class is among the most uncertain outputs of the assessment, so the exact path of stock rebuilding still has considerable uncertainty. Rebuilding projections also indicate there was likely no overfishing in 2018 and that the stock should have climbed above the overfished threshold (50% of the proxy for the spawning stock biomass associated with maximum sustainable yield) in 2018. The stock will be designated overfished until 100% rebuilt. In 2015, the Council set mackerel specifications for 2016-2018. The specifications previously set for 2018 should avoid overfishing in 2018 and allow the mackerel stock to continue rebuilding while a formal rebuilding plan is developed for implementation in 2019.

Mackerel Impacts from Alternative 1, No Action: While the current mackerel specifications were developed to prevent overfishing and to facilitate rebuilding based on projection methods from the latest assessment, the stock was recently declared overfished. As such, the impacts of No Action on the mackerel stock are negative, but low negative given the projections based on the recent assessment, which suggest that under 2018 specifications the stock should rebuild in three years. The Council recently approved a 5-year rebuilding plan, which is being implemented via a separate action. Impacts are slightly less negative than Alternative 2 and less negative than Alternative 3.

Mackerel Impacts from Alternative 2, 5000 pound trip limit at 100% of DAH: This trip limit will allow some additional mackerel fishing and support continued herring fishing that catches mackerel. Landings projections by Council staff based on 2015-2018 landings suggest that if the fishery does not go to a zero possession limit at 100% of the DAH but rather a 5,000 pound trip limit, then only about 384,000 pounds would be additionally landed, which is a small part (17%) of the management uncertainty buffer. The buffer was created primarily to account for uncertainty in closing the fishery on time and the pace of landings after a closure. Given the small amount of buffer projected to be used, catch should stay within the ABC, and rebuilding projections based on the recent mackerel assessment suggest that even with some additional catch (but not exceeding the ABC), there should not be overfishing and the stock should rebuild quickly, within 3-7 years depending on the Council's choices in a rebuilding framework currently being developed. As such, the impacts of Alternative 2 are slightly more negative than Alternative 1 and slightly less negative than Alternative 3. Overall impacts would therefore remain low negative on the mackerel stock if Alternative 2 is implemented.

Mackerel Impacts from Alternative 3, 10,000 pound trip limit at 100% of DAH: This trip limit will allow some additional mackerel fishing and support continued herring fishing that catches mackerel. Landings projections by Council staff based on 2015-2018 landings suggest that if the fishery does not go to a zero possession limit at 100% of the DAH but rather a 10,000 pound trip limit, then only about 514,000 pounds would be additionally landed, which is a small part (23%) of the management uncertainty buffer but slightly more than Alternative 2. The buffer was created primarily to account for uncertainty in closing the fishery on time and the pace of landings after a closure. Given the small amount of buffer projected to be used, catch should stay within the ABC, and projections based on the recent mackerel assessment suggest that even with some additional catch (but not exceeding the ABC), there should not be overfishing and the stock should rebuild quickly, within 3-7

years depending on the Council's choices in a rebuilding framework currently being developed. However a 10,000 pound trip limit may encourage more directed fishing than Alternative 2, increasing the possibility of an ABC overage. As such, the impacts of Alternative 3 are more negative than Alternative 1 and slightly more negative than Alternative 2. Overall impacts would therefore be negative on the mackerel stock if Alternative 3 is implemented.

7.1.2 Impacts on Butterfish

Current resource condition: butterfish are not overfished (141% of target biomass), overfishing is not occurring, and catches are limited to maintain a sustainable fishery. Recent projections from an assessment update suggest a short-term decline (but not to an overfished condition). Butterfish are relatively short-lived and recruitment is variable so substantial year to year populations changes are expected. In general, the Council will seek management that achieves OY, which should be sustainable and maintain the butterfish stock at a non-overfished level. None of the alternatives in this action should affect butterfish catches, which are separately and directly controlled. As such, existing management measures will ensure that catch stays at or below the ABC, maintaining stock size above an overfished condition. While there is some butterfish catch in mackerel fishing, the levels of catch are not substantial enough relative to the butterfish ABC to impact the butterfish stock (see Table 1).

7.1.3 Impacts on Longfin Squid

Current resource condition: longfin squid are not overfished (174% of target biomass). Overfishing status is unknown but likely low according to the most recent assessment, and catches are limited to maintain a sustainable fishery. In general, the Council will seek management that achieves OY, which should be sustainable and maintain the longfin squid stock at a non-overfished level. None of the alternatives in this action should affect longfin squid catches, which are separately and directly controlled. As such, existing management measures will ensure that catch stays at or below the ABC, maintaining stock size above an overfished condition. While there is some longfin squid catch in mackerel fishing, the levels of catch are not substantial enough relative to the longfin squid ABC to impact the longfin squid stock (see Table 1).

7.1.4 Impacts on *Illex* Squid

Current resource condition: while there is no assessment for *Illex* squid, catches have been limited to an amount deemed sustainable by the SSC based on the best available scientific information. In general, the Council will seek management that achieves OY, which should be sustainable and maintain the *Illex* squid stock at a non-overfished level. None of the alternatives in this action should affect *Illex* squid catches, which are separately and directly controlled. There is minimal catch of *Illex* in the mackerel fishery (see Table 1). As such, existing management measures will ensure that catch stays at or below the ABC, maintaining stock size above an overfished condition.

7.2 Habitat

As discussed at the start of Section 7, the availability of mackerel may drive effort (and habitat impacts) as much as quotas and other regulations. Impacts on the habitat for the managed species (7.2.1) and other species (7.2.2) are addressed separately. The word “habitat” encompasses essential fish habitat (EFH) for the purposes of this analysis. The Council has already minimized to the extent practicable impacts to habitat from the MSB fisheries through closure of several canyon areas in MSB Amendment 9 (<http://www.mafmc.org/fmp/history/smb-hist.htm>) and Tilefish Amendment 1 (<http://www.mafmc.org/fmp/history/tilefish.htm>), and protections for Deep Sea Corals via Amendment 16 (<http://www.mafmc.org/fmp/history/smb-hist.htm>). As an overall current resource condition, many habitats in the area of operation of the MSB fisheries are degraded from historical fishing effort (both MSB and other) and from non-fishing activities (Stevenson et al. 2004). Ongoing fishing, and ongoing and new non-fishing activities may also hinder habitat recovery.

7.2.1 Impacts on MSB Species’ Habitat

As described in Section 6.2, most mackerel fishing takes place with mid-water trawl but there is some bottom trawling and handgear effort. Only bottom trawling could have adverse EFH impacts and is the focus of the discussion below. Potential impacts of the alternatives on MSB EFH are discussed first, followed by discussion of impacts on other federally managed species habitat.

Habitat for the managed species (MSB) generally consists of the water column, which is not significantly impacted by fishing activity. The exception to the habitat location being the water column is longfin squid eggs, which are attached to sand, mud, or bottom structure (manmade or natural). However, as determined in Amendment 9, there is no indication that squid eggs are preferentially attached to substrates that are vulnerable to disturbance from fishing/bottom trawling, so no impacts on habitat for longfin squid eggs are expected from any increase or decrease in fishing effort by bottom trawls. Bottom trawling or mid-water trawling won’t impact the water column itself and there is no information to suggest that MSB bottom trawling will degrade the habitat (regardless of effort levels) in a way that would affect longfin squid egg laying or survival, so all three alternatives should have similar, negligible impacts on MSB species’ habitat.

7.2.2 Impacts on Other Federally Managed Species Habitat (see Table 2)

Potential impacts of the alternatives on other federally-managed species EFH are discussed below.

Habitat Impacts from Alternative 1, No Action: As described in section 6.2 above, bottom trawling is used in mackerel fishing and can adversely impact some habitat types. Mid-water trawl and jig fishing would not be expected to have habitat impacts. Since the Council has considered habitat impacts in the past and has already restricted MSB fishing to protect sensitive habitats (e.g. Tilefish habitat, coral protections), the impact of recent levels of fishing are best characterized as overall low negative. No Action would likely reduce effort somewhat from recent levels since under no action there would be no mackerel retention after 100% of the DAH is landed. During 2015-2017, NMFS dealer data indicate there were on average 420 trips that landed herring or mackerel (or both) with bottom trawl (bottom trawl, Ruhle trawl) in November or December, when this action is likely to have an impact. Some proportion of these trips would probably not occur if no mackerel could be retained, though some effort may be redirected toward other species. Since this is a small proportion of all bottom trawl activity and some similar trips might still occur but just discard mackerel, or target other species, overall habitat impacts would be still overall low negative, but slightly less negative than before. Habitat impacts under no action would also be slightly less negative than Alternative 2 or Alternative 3.

Habitat Impacts from Alternative 2, 5000 pound trip limit at 100% of DAH: This trip limit will allow some additional November/December mackerel fishing and support continued herring fishing that catches mackerel compared to no action, but a similar amount of effort compared to recent years. Mid-water trawl and jig fishing would not be expected to have habitat impacts. During 2015-2017 NMFS dealer data indicate there were on average 420 trips that landed herring or mackerel (or both) with bottom trawl (bottom trawl or Ruhle trawl) in November or December, when this action is likely to have an impact. Under no action some proportion of these trips would probably not occur. With Alternative 2, more of these trip would continue to occur though the exact proportion is not possible to pinpoint. Since this alternative would allow more trips to keep occurring, habitat impacts would be slightly more negative than no action, but be similar as occurred in recent years.

Also, only 6% of November-December 2015-2017 mackerel landings were with bottom otter trawl (and most of that on trips greater than 30,000 pounds), so it is not anticipated that allowing some additional small-scale mackerel landings will stimulate more than minimal additional bottom trawl effort. Previously-approved bottom trawling effort in the herring fishery has also already been explicitly considered in that FMP and found to have an impact that is minimal and temporary in nature (NEFMC 2016). Given this, and given the relevant trips are a small proportion of all bottom trawl activity, habitat impacts would be still overall low negative, just slightly more negative than no action. Since slightly fewer trips would probably occur with Alternative 2 versus Alternative 3, impacts would be slightly less negative for Alternative 2.

Habitat Impacts from Alternative 3, 10,000 pound trip limit at 100% of DAH: This trip limit will allow some additional November/December mackerel fishing and support continued herring fishing that catches mackerel compared to no action, but a similar amount of effort compared to recent years. Thus impacts are very similar to Alternative 2, except the higher trip limit may allow more trips to occur, so impacts would be slightly more negative for habitat compared to either no action or Alternative 2, but be similar as occurred in recent years.

7.3 Protected Resources

7.3.1 Introduction

Current resource condition: Affected endangered species and marine mammals (MMPA protected) are described in Section 6.4. For ESA-listed species, any action that has the risk to result in take (including ongoing take) of ESA-listed species is expected to have negative impacts, including actions that reduce interactions (because some take is still occurring and the population is at a critical level). Under the MMPA, the impacts from an action vary based on the stock condition of each marine mammal species and the potential for an action to impact fishing effort. For marine mammal stocks/species that have their potential biological removal (PBR) level reached or exceeded, negative impacts would be expected from any action that has the potential to interact with these species or stocks. For marine mammal stocks/species that are at more sustainable levels (i.e., PBR levels have not been exceeded), any action not expected to change fishing behavior or effort such that interaction risks increase relative to what has been in the fishery previously, may have positive impacts by maintaining takes below the PBR level and approaching the Zero Mortality Rate Goal. Taking the latter into consideration, the overall impacts on the protected resources VEC account for impacts on ESA-listed species, impacts on marine mammal stocks in good condition (i.e., PBR level has not been exceeded), and marine mammal stocks that have reached or exceeded their PBR level.

For no-action and similar to Section 6.4, impacts reference both bottom and mid-water trawl gear since Atlantic mackerel are targeted primarily with these gear types.

7.3.1 General No-Action Impacts

General No-action: MMPA (Non-ESA Listed) Species Impacts

The MSB FMP fisheries do overlap with the distribution of non-ESA listed species of marine mammals (cetaceans and pinnipeds). As a result, marine mammal (non-ESA listed species) interactions with bottom or mid-water trawl gear are possible (see section 6.4); however, ascertaining the risk of an interaction and the resultant potential impacts of the No Action on cetaceans and pinnipeds (marine mammals) are difficult and somewhat uncertain, as quantitative analysis has not been performed.

However, we have considered, to the best of our ability, the most recent (2010-2015) information on marine mammal interactions with commercial fisheries, of which, the MSB FMP is a component (Hayes *et al.* 2017; Hayes *et al.* 2018). Aside from pilot whales and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself (Hayes *et al.* 2017; Hayes *et al.* 2018). Specifically, aside from pilot whales and several stocks of bottlenose dolphin, potential biological removal (PBR) has not been exceeded for any of the non-ESA listed marine mammal species identified in section 6.4 (Hayes *et al.* 2017). Although pilot whales and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR, take reduction strategies and/or plans have been implemented to reduce bycatch in the fisheries affecting these species (Atlantic Trawl Gear Take Reduction Strategy, Pelagic Longline Take Reduction Plan effective May 19, 2009 (74 FR 23349); Bottlenose Dolphin Take Reduction Plan (BDTRP), effective April 26, 2006 (71 FR 24776)). These efforts are still in

place and are continuing to assist in decreasing bycatch levels for these species. Although the most recent information presented in Hayes et al. (2017) and Hayes et al. (2018) is a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and does not address the effects of the MSB FMP specifically, the information does demonstrate that thus far, operation of the MSB FMP, or any other fishery, has not resulted in a collective level of take that threatens the continued existence of non-ESA listed marine mammal populations, aside from those species (pilot whales and bottlenose dolphin stocks) noted above.

Taking into consideration the above information, and the fact that there are non-listed marine mammal stocks/species whose populations may or may not be at optimum sustainable levels, impacts of the No Action on non-ESA listed species of marine mammals are likely to range from low negative to slight positive. Impacts would be low negative for pilot whales and bottlenose dolphin because they are experiencing levels of interactions that have resulted in exceedance of their PBR levels. These stocks/populations are not at an optimum sustainable level and therefore, the continued existence of these stocks/species is at risk. As a result, any potential for an interaction is a detriment to the species/stocks ability to recover from this condition. While the no action alternative may reduce effort slightly (see below in ESA section for details), it is not expected to change to such a degree that these overall impacts would be changed.

Alternatively, there are also many non-ESA listed marine mammals that, even with continued fishery interactions, are maintaining an optimum sustainable level (i.e., PBR levels have not been exceeded) over the last several years. For these stocks/species, it appears that the fishery management measures that have been in place over this timeframe have resulted in levels of effort that equate to interaction levels that are not expected to impair the stocks/species ability to remain at an optimum sustainable level. These fishery management measures, therefore, have resulted in indirect slight positive impacts to these non-ESA listed marine mammal species/stocks. Should future fishery management actions maintain similar operating condition as they have over the past several years, it is expected that these slight positive impacts would remain. Thus, given that the No Action will not substantially change fishing effort and may slightly reduce fishing effort, the impacts of the No Action on these non-ESA listed species of marine mammals (all besides pilot whales and bottlenose dolphin) are expected to be slight positive (i.e., continuation of current or slightly reduced operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

General No-action: ESA Listed Species Impacts

The MSB fishery is primarily prosecuted with bottom and mid-water trawl gear. As provided in section 6.4, these gear types are known to interact with ESA listed species of sea turtles, Atlantic sturgeon, and Atlantic salmon, with interactions often resulting in the serious injury or mortality to the species. The risk of an interaction; however, is strongly associated with the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of listed species in the same area and time as the gear, with risk of an interaction increasing with increases in of any or all of these factors. Based on this, the MSB fishery is likely to result in some level some level of negative impacts to ESA listed species. Taking into consideration fishing behavior/effort under the No Action, as well as the factors that affect the risk of an interaction with a listed species, we determined the level of negative impacts to ESA listed species to be low. Below, we provide support for this determination.

Under the No Action, fishing behavior and effort in the MSB fishery is expected to remain approximately similar to what has been observed in the fishery over the last 5 or more years. As described above for habitat, there might be somewhat less bottom trawl effort under no action, but compared to overall trawl effort the change is not expected to be substantial. Similarly, during 2015-2017 NMFS dealer data indicate there were on average 73 trips that landed herring or mackerel (or both) with mid-water trawl in November or December, when this action is likely to have an impact. Some proportion of these trips would probably not occur if no mackerel could be retained. Since this is a small proportion of all trawl activity and some similar trips might still occur but just discard mackerel, overall impacts to ESA listed species would, overall, still be low negative.

Specifically, the amount of trawl gear, tow times, and area fished are not expected change significantly from current operating conditions. As provided above, interactions risks with ESA listed species are strongly associated with the amount of gear in the water, gear soak or tow time, as well as the area of overlap, either in space or time, of the gear and listed species, with vulnerability of an interaction increasing with increases in any of these factors. Continuation of “status quo” fishing behavior/effort or slightly less effort is not expected to change any of these operating conditions and therefore, relative to current conditions, new or elevated (e.g., more gear, longer tow times) interaction risks to listed species are not expected. Based on this, impacts of the No Action on ESA listed species is expected to remain low negative.

7.3.2 Impacts from Specific Alternatives

Protected Resource Impacts from Alternative 1, No Action: As detailed in the introduction to this Section (see 7.3.1), no action is expected to have low negative impacts on ESA listed species, pilot whales, and bottlenose dolphins, and slight positive impacts for other (non-ESA listed) MMPA species. No action, which maintains a full closure at 100% of the mackerel DAH, may decrease November/December trawl effort compared to recent effort (by up to 420 bottom trawl trips and 73 mid- water trawl trips, as described above). Since Alternatives 2 and 3 would facilitate some trawl-based herring and mackerel fishing that has been occurring during November-December but might no longer occur under the no action, impacts would be slightly less negative for no-action compared to Alternatives 2/3 for ESA listed species, pilot whales, and bottlenose dolphins, and slightly more positive for other MMPA species. Overall impacts from no action would still be expected to be low negative for ESA- listed species, pilot whales, and bottlenose dolphins and slight positive for other MMPA species. The potential changes in effort are relatively small compared to just the 15,071 total bottom trawl trips in 2017 in NMFS dealer data and 262 mid-water trawl trips in 2017 in NMFS VTR data (pers com Kiersten Curti, NEFSC, also MAFMC 2018b).

Protected Resource Impacts from Alternative 2, 5000 pound trip limit at 100% of DAH: This trip limit will allow some continued November-December mackerel fishing and herring fishing that catches mackerel compared to no action but similar to previous years. Given the low trip limit, November-December effort would likely be reduced compared to recent years but not as much as the reduction expected under the no action. Overall impacts under this alternative would still be expected to be low negative for ESA-listed species, pilot whales, and bottlenose dolphins and slight positive for other MMPA species. Relative to no action the impacts are slightly more negative for protected resources and relative to Alternative 3 impacts are slightly less negative due to the lower effort expected with the lower trip limit in Alternative 2 versus Alternative 3. The potential changes in effort are relatively

small compared to just the 15,071 total bottom trawl trips in 2017 in NMFS dealer data and 262 mid-water trawl trips in 2017 in NMFS VTR data (pers com Kiersten Curti, NEFSC, also MAFMC 2018b).

Protected Resource Impacts from Alternative 3, 10,000 pound trip limit at 100% of DAH: This trip limit will allow some continued November-December mackerel fishing and herring fishing that catches mackerel, but similar to previous years. Given the low trip limit, November-December effort would likely be reduced compared to recent years but not as much as the reduction expected under the no action. Overall impacts under this alternative would still be expected to be low negative for ESA-listed species, pilot whales, and bottlenose dolphins and slight positive for other MMPA species. Relative to no action the impacts are slightly more negative for protected resources and relative to Alternative 2 impacts are also slightly more negative due to the slightly higher effort expected with the higher trip limit in Alternative 3 versus Alternative 2. The potential changes in effort are relatively small compared to just the 15,071 total bottom trawl trips in 2017 in NMFS dealer data and 262 mid-water trawl trips in 2017 in NMFS VTR data (pers com Kiersten Curti, NEFSC, also MAFMC 2018b).

7.4 Non-Target Resources

Current Resource Condition:

Bycatch in the mackerel fishery is described in Section 6.1 and is relatively low, less than 1%. Atlantic herring are a target species since the directed fishery targets mackerel and Atlantic herring. Non-negligible non-target species therefore include silver hake, spiny dogfish, alewife, blueback herring, American shad, haddock, red hake, winter skate, and John Buckler Dory. Of these red hake is experiencing overfishing and is overfished (<https://www.nefsc.noaa.gov/publications/crd/crd1802/crd1802.pdf>). There is no assessment for John Buckler Dory. Alewife, blueback herring, and American shad have been found to be depleted by the ASMFC, and assessment information is available at www.asmfc.org. Assessments for silver hake, spiny dogfish, haddock, and winter skate (not overfished, no overfishing) can be found at <https://www.nefsc.noaa.gov/saw/>. Mortality from bycatch is accounted for with species that are managed under a fishery management plan. For unmanaged species, we have no data to indicate the impact that these measures would have on them.

Non-target resources Impacts from Alternative 1, No Action: The existing management measures would continue under no-action. Accordingly, since no action may slightly decrease trawl effort compared to the status quo (up to 420 bottom trawl trips and 73 mid-water trawl trips, as described above), impacts from no action are expected to be slightly less negative for non-target species. The auto-jig fishery appears to have minimal non-target interactions and constitutes a minor component of the fishery (see Section 6.1). The overall effort change is not expected to be substantial (some trips may target other species and some may just discard mackerel), so overall non-target impacts would likely remain low negative. Previously-approved trawling effort in the herring fishery has already been explicitly considered in that FMP and found to have an impact that is negligible (NEFMC 2016).

Non-target resources Impacts from Alternative 2, 5000 pound trip limit at 100% of DAH: This trip limit will allow some additional November/December mackerel fishing and support continued herring fishing that catches mackerel compared to no action, but similar to current effort. Changes to auto-jig fishing are expected to have negligible impacts – minimal non-target encounters were observed in 4 late-season observed trips that were handline or auto-jig targeting mackerel during 2015-2017. The auto jig fishery also constitutes a minor portion of the fishery.

Some of the trawl fishing that might not occur under the no action (up to 420 bottom trawl trips and 73 mid-water trawl trips, as described above) might continue to occur with Alternative 2. Continuing the previous impacts to non-target species described above would be slightly more negative compared to no action. Overall impacts on non-target species would likely remain low negative. Impacts would be slightly less negative for Alternative 2 than Alternative 3 because Alternative 3 may allow more trips to occur. The potential changes in effort are relatively small compared to just the 15,071 total bottom trawl trips in 2017 in NMFS dealer data and 262 mid-water trawl trips in 2017 in NMFS VTR data (pers com Kiersten Curti, NEFSC, also MAFMC 2018b).

Non-target resources Impacts from Alternative 3, 10,000 pound trip limit at 100% of DAH: This trip limit will allow some additional November/December mackerel fishing and support continued herring fishing that catches mackerel compared to no action, but similar to current effort. Thus impacts are very similar to Alternative 2, except the higher trip limit may allow more trips to occur, so impacts would be slightly more negative for non-target species compared to either no action or Alternative 2. The potential changes in effort are relatively small compared to just the 15,071 total bottom trawl trips in 2017 in NMFS dealer data and 262 mid-water trawl trips in 2017 in NMFS VTR data (pers com Kiersten Curti, NEFSC, also MAFMC 2018b).

7.5 Socioeconomic Impacts

Current Condition: This action could affect the mackerel and herring fisheries, and separate summary information of the current condition is provided first for each fishery. The performance of each fishery is further described above in Section 6.3. As discussed above, the availability of the targeted species may drive effort (and catch and revenues) as much as any regulations.

Mackerel fishery Current Condition: Due to the year to year variation in catch and effort in the fishery, it is difficult to fully quantify economic and social human community impacts but vessel participation and ex-vessel revenues can provide some scope of the potential economic impact, and economic impacts will have social impacts related to jobs and community stability. The current mackerel fishery supports a number of vessels, as described in Section 6.3, and provides numerous jobs related directly to fishing and also in associated support services. 55 vessels landed over 10,000 pounds of mackerel in 2017, with total mackerel landings valued at \$4.1 million. The fishery is expected to continue to support fishing vessels and related support services at similar in the short and long run based on the Council's risk policy and implementation of that risk policy in specifications. While a rebuilding plan is being developed, it is not expected to result in substantial negative economic impacts relative to recent fleet operations (catch limits had been proactively reduced previously and may actually be able to increase due to incoming recruitment).

Atlantic Herring fishery Current Condition: Due to the year to year variation in catch and effort in the fishery, it is difficult to fully quantify economic and social human community impacts but vessel participation and ex-vessel revenues can provide some scope of the potential economic impact, and economic impacts will have social impacts related to jobs and community stability. The current herring fishery supports a number of vessels, as described in Section 6.3, and provides numerous jobs related directly to fishing and also in associated support services. 40 vessels landed over 10,000 pounds of herring in 2017, with total herring landings valued at \$27.4 million. A recent assessment is likely to lead to substantially lower quotas in the short run, but in the long run the management responses to a lower stock size should rebuild the fishery, and optimize landings and revenues from the fishery.

Socioeconomic Impacts from Alternative 1, No Action: The existing management measures would persist under no-action. Accordingly, November and December (Nov/Dec) mackerel and herring operations could be affected if/when the mackerel fishery fully closes with no possession. Recent Nov/Dec mackerel landings 2015-2017, which should be most reflective of what might happen in 2018 or future years, have averaged \$1.8 million and recent Nov/Dec herring landings 2015-2017 have averaged \$3.3 million. If no action is taken, some part of these revenues from landings may be forgone. This would be more negative than Alternatives 2 or 3.

Socioeconomic Impacts from Alternative 2, 5,000 pound trip limit at 100% of DAH: This trip limit will allow some additional November/December mackerel fishing and support continued herring fishing that catches mackerel compared to no action, but similar to recent years. Given the low trip limit, the primary additional mackerel fishing that might occur under this alternative is likely to be with auto-jig gear in November and December. A low percentage of mackerel is typically caught on trips less than 20,000 pounds - the 5,000 pound trip limit is likely too low to lead to substantial additional directed trawling for mackerel. Nov/Dec handgear fishing, which is the categorization for the auto-jig gear, accounted for \$0.4 million on average 2015-2017. If their landings greater than 5,000 pounds are limited to 5,000 pounds the total is \$0.3 million and could be one benefit from Alternative 2. By holding 2015-2017 Nov/Dec mackerel landings on trawl trips to 5,000 pounds, there could also be an additional \$0.1 million in mackerel harvest (from likely a mix of incidental and directed activity). Industry has reported that they can conduct herring fishing in Nov-Dec with a 5,000 pound mackerel trip limit, so the \$3.3 million in average herring revenues that this alternative could also support is another potential benefit. Accordingly, Alternative 2 could result in approximately \$3.7 million in additional ex-vessel revenue from the combined mackerel and herring fisheries compared to no action and slightly less revenues than Alternative 3. These additional ex-vessel revenues would also provide additional non-quantifiable economic and social benefits related to support services and employment due to the preservation of fishing activity. The impacts are thus positive but not significant due to the small component of overall regional fishing impacted by these measures.

Socioeconomic Impacts from Alternative 3, 10,000 pound trip limit at 100% of DAH: This trip limit will allow some additional November/December mackerel fishing and support continued herring fishing that catches mackerel compared to no action, but similar to recent years. Given the low trip limit, the primary additional mackerel fishing that might occur under this alternative is likely to be with auto-jig gear in November and December. A low percentage of mackerel is typically caught on trips less than 20,000 pounds - the 10,000 pound trip limit is likely too low to lead to substantial additional directed trawling for mackerel. Nov/Dec handgear fishing, which is the categorization for the auto-jig gear, accounted for \$0.4 million on average 2015-2017. If their landings greater than 10,000 pounds are limited to 10,000 pounds the total is \$0.4 million and could be one benefit from Alternative 3. By holding 2015-2017 Nov/Dec mackerel landings on trawl trips to 10,000 pounds, there could also be an

additional \$0.1 million in mackerel harvest. Industry has reported that they can conduct herring fishing in Nov-Dec with a 10,000 pound mackerel trip limit, so the \$3.3 million in average herring revenues that this alternative could also support is another potential benefit. Accordingly, Alternative 3 could result in approximately \$3.8 in additional ex-vessel revenue from the combined mackerel and herring fisheries compared to no action and slightly more revenues than Alternative 2. These additional ex-vessel revenues would also provide additional non-quantifiable economic and social benefits related to support services and employment due to the preservation of fishing activity. The impacts are thus positive but not significant due to the small component of overall regional fishing impacted by these measures.

7.6 Cumulative Impacts

7.6.0. Cumulative Impacts Introduction

The information presented in section 7.6 of the original EA, which described the affected environment, geographic and temporal scope of the VECs, and past, present, and reasonable foreseeable future actions, is incorporated by reference and supplemented by the following information.

Summary of the Past, Present and Reasonably Foreseeable Future Actions

Additional Past actions

Amendment 16 implemented protections for deep-water corals. Framework 9 followed-up on Amendment 14's measures to specifically improve observer operations by minimizing slippage (unobserved discards) and NMFS has implemented a new Standardized Bycatch Reporting Methodology in Amendment 15 to address observer assignment deficiencies identified in a previous lawsuit. The Mid-Atlantic Unmanaged Forage Omnibus Amendment restricted the expansion of commercial fisheries for certain forage species, some of which are encountered in the MSB fisheries. Past annual specifications have also limited catches to avoid overfishing.

Additional Future actions

Several future actions are relevant to the MSB fisheries. First, annual specifications actions in future years should avoid overfishing and support harvest of optimum yield, particularly in response to the 2017 Atlantic mackerel assessment. An action in 2018 will establish a rebuilding plan for mackerel along with 2019-2021 specifications, including a river herring/shad catch cap for the fishery. By 2020, the Council is expected to formally integrate Atlantic chub mackerel (*Scomber colias*) into the MSB FMP, implementing an annual catch limit and other measures to prevent overfishing of this species. The Council is planning on revising the goals and objectives of the MBS FMP in 2018, which could indirectly affect future decision-making. The Council is also planning on revising EFH for all species and considering the impacts of fishing on EFH before 2021. The Council plans to consider requiring commercial vessels to submit Vessel Trips Reports (VTRs) to improve reporting before 2021. A proposed rule is also pending that could further limit access to the longfin squid fishery and more firmly close that fishery once the quota is caught during Trimester 2 (May-August). Future actions at

the New England Fishery Management Council (NEFMC) will likely extend deep-water coral protections in the New England area and protect deep-water corals there against any future expansion of the MSB fisheries in the rest of the continental slope. The NEFMC is also considering limited access in the whiting fishery, which may have indirect and as of yet undetermined impacts on the participants in the longfin squid fishery. A recent assessment showing poor recruitment is also likely to result in substantial reductions to Atlantic herring quotas in 2018 and for at least several additional years.

Regarding protected resources, the status of several species are currently being reviewed by NMFS-GARFO to determine whether listing of these species under the ESA is warranted. These species are considered candidate species under the ESA and include cusk, alewife, and blueback herring. Additional information on cusk, alewife and blueback herring can be found at: <https://www.fisheries.noaa.gov/endangered-species-conservation/candidate-species-under-endangered-species-act>.

Overall all of these fishery actions have served to or will reduce effort or the impacts of effort through access limitations, upgrade restrictions, area and gear restrictions, EFH designations, monitoring, and accountability. These reductions have likely benefitted the managed species, habitat, protected resources, and non-target species. By ensuring the continued productivity of the managed resources, the human communities that benefit from catching the managed resources have also benefited in the long term; though at times quota reductions may have caused short-term economic dislocations.

As described in the original EA and expected to be similar, effects from non-fishing activities (e.g. climate change, point source and non-point source pollution, shipping, dredging, storm events, wind energy facilities, oil and gas development, construction, etc.) on managed species, non-target species, and protected species are likely to be neutral to low negative.

7.6.1. Cumulative Effects Analysis

The cumulative impacts of this FMP were last fully addressed in final form by the EIS for Amendment 14 (<http://www.greateratlantic.fisheries.noaa.gov/regs/2013/August/12smba14pr.html>). All four species in the management unit are managed primarily via annual specifications to control fishing mortality so the operation of the fishery is generally reviewed annually. As described in the original EA, the cumulative impact of this FMP and annual specification process has been positive after passage of the Magnuson-Stevens Act and since its implementation for both the resources and communities that depend on them.

7.6.1. Target Fisheries and Managed Resources (updates from original EA)

Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions has resulted in positive effects on target species. The latest assessment indicates that mackerel was overfished with overfishing occurring in 2016, but existing quotas and improved recruitment are projected to have ended overfishing in 2018 and to have brought the stock above the overfished threshold (i.e. above half of rebuilt status) by June 2018. The preferred alternative should not affect this outcome for mackerel. This action should not affect longfin squid, *Illex* squid, or butterfish. By facilitating late-season Atlantic herring fishing, higher Atlantic herring catches would be expected,

but catches should not exceed ABCs. The 2019-2021 specifications for mackerel should continue to help rebuild the mackerel stock, resulting in positive impacts for the mackerel stock (but the impacts are not expected to be significant from a NEPA perspective).

Since MSB species occur over wide areas of the mid and north Atlantic Ocean and inhabit both inshore and offshore pelagic waters, it is not believed that any indirect anthropogenic activity currently impacts these populations significantly, even when considered together with the direct effects on these populations from fishing.

7.6.2 Essential Fish Habitat (EFH) (updates from original EA)

Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions has resulted in low negative effects on habitat (both in terms of MSB bottom trawl effort generally and on longfin squid eggs from all bottom trawling in applicable areas). The effects of the proposed action on habitat are considered neutral, since it is not expected to increase effort with bottom-contacting fishing gear. Since impacts from the proposed action were found to be neutral with respect to habitat impacts, when considering the cumulative effects of this action in combination with past, present, and reasonably foreseeable future actions, impacts will remain low negative and no significant impacts to the physical environment, habitat or EFH from the proposed action are expected.

7.6.3 Protected Species (updates from original EA)

Given the minor changes in effort predicted and the nature of that effort, no significant cumulative impacts to protected species are expected. The baseline condition would be maintained (i.e. low negative for ESA species and MMPA species that have exceeded PBR; slight positive for MMPA species below PBR), similar to previous years.

7.6.4 Human Communities (updates from original EA)

The proposed measure should increase fishery revenues, though not in a significant manner. The proposed action, in conjunction with the past and future actions described above, should have ongoing positive, non-significant cumulative impacts for the communities which depend on these resources primarily by maintaining stock sizes that continue to lead to optimal sustainable harvests.

7.6.5 Non-target Species (updates from original EA)

As noted above in Section 7.4, the preferred alternative is not expected to substantially change non-target interactions. The baseline condition would be maintained (i.e. low negative for non-target species), similar to previous years due to ongoing interactions and previous efforts to reduce interactions.

7.6.6 Summary of cumulative impacts

The impacts of the preferred alternatives on the biological, physical, and human environment are described in sections 7.1-7.5. The implementation of this action is expected to generate neutral to positive impacts by increasing fishery revenues without reducing conservation of the other VECs. Indirect benefits of the preferred alternatives are likely to affect consumers and areas of the economic and social environment that interact in various ways with these fisheries but they are not expected to be significant. The impact of the proposed actions, when considered together with past and future actions are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment. As long as management continues to prevent overfishing and rebuild overfished stocks, the fisheries and their associated communities should continue to benefit. As noted in the original EA, the historical development of the FMP resulted in a number of actions which have impacted these fisheries and other valued ecosystem components. The cumulative effects of past actions in conjunction with the proposed action and possible future actions are discussed above. Within the construct of that analysis, the Council has concluded that no significant cumulative impacts will result from the proposed specifications.

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8.0 WHAT LAWS APPLY TO THE ACTIONS CONSIDERED IN THIS DOCUMENT?

8.1 Magnuson-Stevens Fishery Conservation and Management Act

8.1.1 NATIONAL STANDARDS

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery management plans contain conservation and management measures that are consistent with the ten National Standards:

In General. – Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the...national standards for fishery conservation and management.

(1) 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.

The proposed action would increase yield while preventing overfishing, thus helping to achieve optimum yield in both the Atlantic mackerel and Atlantic herring fisheries.

(2) Conservation and management measures shall be based upon the best scientific information available.

The data sources considered and evaluated during the development of this action include, but are not limited to: permit data, landings data from vessel trip reports, information from resource trawl surveys, sea sampling (observer) data, data from the dealer weighout purchase reports, peer-reviewed assessments and original literature, and descriptive information provided by fishery participants and the public. To the best of the Council's knowledge these data sources constitute the best scientific information available. All analyses based on these data have been reviewed by National Marine Fisheries Service and the public.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The fishery management plan addresses management of the mackerel, squid, and butterfish stocks throughout the range of the species in U.S. waters, in accordance with the jurisdiction of U.S. law.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

There is nothing in the proposed action that would be expected to discriminate between residents of different States.

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

There is no allocation proposed. The proposed actions are efficient in that they should allow fuller utilization of the mackerel and herring quotas.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Changes in fisheries occur continuously, both as the result of human activity (for example, new technologies or shifting market demand) and natural variation (for example, oceanographic perturbations). In order to provide the greatest flexibility possible for future management decisions, the fishery management plan includes a framework adjustment mechanism with an extensive list of possible framework adjustment measures that can be used to quickly adjust the plan as conditions in the fishery change. The proposed action would allow for a small amount of Atlantic mackerel bycatch in the Atlantic herring fishery to continue for the remainder of the year. This enables the herring fishery to continue during years in which high mackerel landings early in the season closes the directed mackerel fishery and reduces catch allowances for permitted vessels.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

As always, the Council considered the costs and benefits associated with the management measures proposed in the action when developing this action. This action should not create any duplications related to managing the MSB resources.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The human community impacts of the action are described above in Section 7.5. The proposed action would increase yield and revenues to human communities by preserving a limited bycatch of Atlantic mackerel in the Atlantic herring fishery that would allow that fishery to continue operating without compromising efforts to sustainably manage the Atlantic mackerel resource.

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The Magnuson-Stevens Act defines “bycatch” as fish that are harvested in a fishery, but are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidentally landed catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. Previous actions have reduced bycatch to the extent practicable, as described elsewhere in this document. The proposed actions should not increase bycatch, and may avoid some regulatory discards by not going to a zero possession trip limit for mackerel.

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Fishing is a dangerous occupation; participants must constantly balance the risks imposed by weather against the economic benefits. According to the National Standard guidelines, the safety of the fishing vessel and the protection from injury of persons aboard the vessel are considered the same as “safety of human life at sea.” The safety of a vessel and the people aboard is ultimately the responsibility of the master of that vessel. Each master makes many decisions about vessel maintenance and loading and about the capabilities of the vessel and crew to operate safely in a variety of weather and sea conditions. This national standard does not replace the judgment or relieve the responsibility of the vessel master related to vessel safety. Nothing in this action is expected to negatively impact safety at sea.

8.1.2 OTHER REQUIRED PROVISIONS OF THE MAGNUSON-STEVENS ACT

Section 303 of the MSA contains 15 additional required provisions for FMPs, which are listed and discussed below. Nothing in this action is expected to contravene any of these required provisions.

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law

The MSB FMP has evolved over time through 20 Amendments and currently uses Acceptable Biological Catch recommendations from the Council's Scientific and Statistical Committee to sustainably manage the Mackerel, Squid, and Butterfish fisheries. Under the umbrella of limiting catch to the Acceptable Biological Catch, a variety of other management and conservation measures have been developed to meet the goals of the fishery management plan and remain consistent with the National Standards. The current measures are codified in the Code of Federal Regulations (50 C.F.R. § 648 Subpart B - <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=1e9802ffddb05d0243d9c657fade956c&rgn=div5&view=text&node=50:12.0.1.1.5&idno=50>) and summarized at <http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/msbinfosheet.pdf>. This action should continue to promote the long-term health and stability of the fisheries, consistent with the MSA.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any

Every Amendment to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan provides this information. This document updates this information as appropriate in Section 6.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification

This provision is addressed via assessments that are conducted through a peer-reviewed process at the NMFS Northeast Fisheries Science Center. The available information is summarized in every Amendment and Specifications document – see Section 6. Full assessment reports are available at: <http://www.nefsc.noaa.gov/saw/>.

(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States

Based on past performance and capacity analyses (Amendment 11), if Atlantic mackerel, squid, and butterfish are sufficiently abundant and available, the domestic fishery has the desire and ability to fully harvest the available quotas, and domestic processors can process the fish/squid.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors

Previous Amendments have specified the data that must be submitted to NMFS in the form of vessel trip reports, vessel monitoring system trip declarations and catch reports, and dealer reports.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery

There are no such requests pending, but the plan contains provisions for framework actions to make modifications regarding access/permitting if necessary.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat

Section 6.3 of this document summarizes essential fish habitat (EFH). Amendments 9 and 11 evaluated habitat impacts, updated essential fish habitat designations, and implemented measures to reduce habitat impacts (primarily related to tilefish essential fish habitat). Amendment 16

implemented measures to protect deep-sea corals. An upcoming review of EFH will review EFH designations and potential adverse impacts to EFH from Council-managed fisheries.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan

The preparation of this action included a review of the scientific data available to assess the impacts of all alternatives considered. No additional data was deemed needed for effective implementation of the plan at this time.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;

Section 7.5 of this document provides an assessment of the likely effects on fishery participants and communities from the considered actions.

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery

Amendments 8 and 9 to the fishery management plan established biological reference points for the species in the plan, and Amendment 10 contained measures for butterfish rebuilding. Mackerel was recently declared overfished and a rebuilding action is under development. If a fishery is declared overfished or if overfishing is occurring, another Amendment or appropriate action would be undertaken to implement effective corrective measures. A recent omnibus framework also streamlined incorporation of new overfished/overfishing reference points.

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority-- (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided

NMFS has implemented an omnibus amendment to implement a revised standardized reporting methodology since the previous methodology was invalidated by court order. See <http://www.greateratlantic.fisheries.noaa.gov/mediacenter/2013/09/draftsbrmamendment.html> for details.

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish

The Atlantic mackerel, squid, and butterfish fisheries are primarily commercial. There are some discards in the recreational mackerel fishery, but these are minimal related to the overall scale of the mackerel fishery. There are no size limits that would lead to regulatory recreational discarding of mackerel. There are no specific catch and release fishery management programs. There is some recreational longfin squid fishing, but it is thought to be relatively minor and the Council can consider if a survey is appropriate to further investigate longfin squid recreational fishing.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors

This document updates this information as appropriate in Section 6. There is minimal recreational and charter fishing for squid, and this action would not restrict such activity.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

No rebuilding plans are active (or currently necessary). A rebuilding action is being developed in 2018 for Atlantic mackerel due to a recent stock assessment indicating that the stock is overfished and subject to overfishing. That action would address the equitable allocation of harvest restrictions or recovery benefits.

(15) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.

The annual specifications process addresses this requirement. Acceptable Biological Catch recommendations from the Council's Scientific and Statistical Committee are designed to avoid overfishing and form the upper bounds on catches. There are a variety of proactive and reactive accountability measures for these fisheries, fully described at: <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=1e9802ffddb05d0243d9c657fade956c&rgn=div5&view=text&node=50:12.0.1.1.5&idno=50#50:12.0.1.1.5.2>.

8.1.3 DISCRETIONARY PROVISIONS OF THE MAGNUSON-STEVENSON ACT

Section 303b of the Magnuson-Stevens Act contains 14 additional discretionary provisions for Fishery Management Plans. They may be read on pages 59 and 60 of the National Marine Fisheries Service's redline version of the Magnuson-Stevens Act at:

http://www.nmfs.noaa.gov/msa2007/MSA_Amended%20by%20Magnuson-Stevens%20Reauthorization%20Act%20%281-31-07%20draft%29.pdf. As discretionary provisions of Fishery Management Plans (FMPs), the MSA also allows restriction of fishing by gear/area/time/season. Seasonal management based on attainment of quotas has been previously incorporated into the MSB FMP and this action could modify the existing provisions regarding how the fishery closes due to attainment of the DAH.

8.1.4 ESSENTIAL FISH HABITAT ASSESSMENT

The preferred alternative proposed in this action is not expected to result in substantial changes in effort that impacts habitat, as described in Section 7. Therefore, the Council concluded in section 7 of this document that the proposed action will have no additional adverse impacts on EFH that are more than minimal. Thus no mitigation is necessary. The adverse impacts of bottom trawls used in MSB fisheries on other managed species (not MSB), which were determined to be more than minimal and not temporary in Amendment 9, were minimized to the extent practicable by the Lydonia and Oceanographer canyon closures to squid fishing. In addition, Amendment 1 to the Tilefish FMP closed those canyons plus Veatch's and Norfolk Canyons to all bottom trawling. Deepwater corals were also protected in Amendment 16. Therefore, the adverse habitat impacts of MSB fisheries "continue to be minimized." Amendment 11 revised the MSB EFH designations and EFH impacts will continue to be monitored and addressed as appropriate.

8.2 NEPA

8.2.1 Finding of No Significant Impact (FONSI)

The Council on Environmental Quality (CEQ) Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR 1508.27). In addition, the Companion Manual for National Oceanic and Atmospheric Administration Administrative Order 216-6A provides sixteen criteria, the same ten as the CEQ Regulations and six additional, for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

As described in Section 7 of this document, the proposed action may result in higher, but not significantly higher, fishery revenues. Also as described in Section 7 of this document, there are not expected to be other impacts that are significant, either beneficial or adverse, for target species, non-target species, protected resources, or habitat (also see the original EA).

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

As described in Section 7 of this document, the proposed action should not substantially alter the manner in which the industry conducts fishing activities for Atlantic mackerel. Therefore, the proposed action is not expected to adversely impact public health or safety (also see the original EA).

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

The action proposed addresses management of the mackerel fishery, which was established in the MSB FMP and modified in various amendments, frameworks, and specifications. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels typically avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. As described in Section 7 of this document, the proposed action should not substantially alter the manner in which the industry conducts fishing activities for the target species (also see the original EA). Therefore, it is not likely that the preferred alternative would adversely affect the historic resources listed above (also see the original EA).

4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

This action simply modifies a landing limit for mackerel. The proposed action is based on measures contained in the FMP, which have been in place for many years. In addition, the scientific information upon which the annual quotas are based has been peer reviewed and is the most recent information available (see Section 6). Thus, the effects of this action are not expected to be highly controversial.

5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

While there is always a degree of variability in the year to year performance of the relevant fisheries, as described in Section 7 of this document, the proposed action should not substantially alter the way the industry conducts fishing activities for the target species. As a result, the effects on the human environment of the proposed action are not highly uncertain nor do they involve unique or uncertain risks (also see the original EA).

6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

The proposed action modifies existing measures and the modifications have been proposed and evaluated consistent with the existing fishery management plan and therefore is neither likely to establish a precedent for future actions with significant effects nor to represent a decision in principle about a future consideration (also see the original EA).

7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

The impacts of the preferred alternatives on the biological, physical, and human environment are described in Section 7 of this document and the original EA. The overall interaction of the proposed action with other past, present and reasonably foreseeable future actions, including non-fishing activities, are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?

The action proposed addresses management of the MSB fisheries, which was established in the FMP and modified in various amendments, frameworks, and specifications. Other types of commercial fishing already occur in this area, and although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternative would result in substantial impacts to unique areas (also see the original EA).

9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?

The proposed action is not expected to substantially alter overall fishing operations, lead to a substantial increase of fishing effort that could affect these species, or alter the spatial and/or temporal distribution of current fishing effort (see Section 7 of this document) in a manner that would increase interaction rates with protected species (also see the original EA).

This action falls within the range of impacts considered in the Batched Fisheries Biological Opinion for the Atlantic Mackerel, Squid, and Butterfish Fisheries (December 16, 2013). However, in a memorandum dated October 17, 2017, GARFO's Protected Resources Division reinitiated consultation on the Batched Biological Opinion. As part of the reinitiation, it was determined that allowing these fisheries to continue during the reinitiation period will not violate ESA sections 7(a)(2) and 7(d)

because it will not increase the likelihood of interactions with protected species above the amount that was previously considered in the 2013 Batched Biological Opinion. Therefore, conducting the proposed action during the reinitiation period would not be likely to jeopardize the continued existence of any whale, sea turtle, Atlantic salmon, or sturgeon species.

As described in section 6.4, the proposed action is not likely to adversely affect any designated critical habitat. The Atlantic mackerel, squid, and butterfish fisheries will not affect the essential physical and biological features of North Atlantic right whales or loggerhead (Northwest Atlantic Ocean DPS) critical habitat and therefore, will not result in the destruction or adverse modification of critical habitat (NMFS 2014a; NMFS 2015a,b).

10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

As described in Section 7 of this document, overall fishing effort is not expected to substantially increase in magnitude under the proposed action. In addition, the proposed action is not expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Thus, it is not expected that they would threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The proposed action has been found to be consistent with other applicable laws as described in this Section (also see the original EA).

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

The MSB fisheries have the potential to interact with multiple marine mammal species. As described in Section 7 of this document, relevant fishing effort is not expected to substantially increase in magnitude under the proposed action. In addition, the proposed action is not expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Therefore, this action is not expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act (also see the original EA).

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

As described in Section 7 of this document, the proposed action is not expected to jeopardize the sustainability of any target species affected by the action. The preferred alternatives are consistent with the FMP and best available scientific information. As such, the proposed action is expected to ensure the long term sustainability of harvests from the MSB stocks and Atlantic herring. The proposed action is not expected to jeopardize the sustainability of any non-target species (see section 7 of this document) because the proposed action is not expected to result in substantial increases in relevant overall fishing effort. In addition, the proposed action is not expected to substantially alter fishing methods or the temporal and/or spatial distribution of fishing activities. Therefore, none of the proposed actions are expected to jeopardize the sustainability of non-target species (also see the original EA).

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

The proposed action is not expected to cause damage to the ocean, coastal habitats, and/or EFH as defined under the Magnuson Stevens Act and identified in the FMP (see Section 7). In general, bottom

tending mobile gear, primarily otter trawls, which are used to harvest mackerel, squid, and butterfish, have the potential to adversely affect EFH for the benthic lifestages of a number of species in the Northeast region that are managed by other FMPs. However, as described in Section 7 of this document, this action should not cause any substantial increase in overall bottom-tending fishing effort relative to the status quo. Thus this action is not expected to have any substantial negative impact on EFH or on coastal and ocean habitats (also see the original EA).

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

Deep coral ecosystems have been protected from bottom-tending mobile gear used in the MSB fisheries by previous Council actions. Overall fishing effort is not expected to substantially increase in magnitude under the proposed action (see Section 7 of this document). In addition, the proposed action is not expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Thus, it is not expected that the action would adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems (also see the original EA).

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

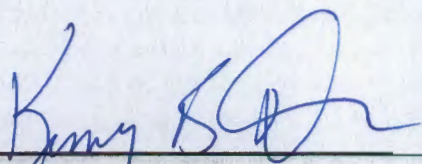
Midwater trawl and auto-jigging should not impact habitat. The auto jig fishery also constitutes a minor portion of the fishery. The mackerel fishery is also prosecuted using bottom otter trawls, which have the potential to impact bottom habitats. In addition, a number of non-target species are taken incidentally to the prosecution of these fisheries. However, trawl fishing effort is not expected to substantially increase in magnitude under the proposed action (see Section 7 of this document). In addition, the proposed action is not expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort. Therefore, the proposed action is not expected to have a substantial impact on biodiversity or ecosystem function (e.g. food webs) within the affected area (also see the original EA).

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

There is no evidence or indication that these fisheries have ever resulted or would ever result in the introduction or spread of nonindigenous species (also see the original EA).

NEPA FONSI DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for this action, it is hereby determined that these proposed MSB FMP action will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an environmental impact statement for this action is not necessary.



For Michael Pentony

DEC 06 2018

Date

Greater Atlantic Regional Administrator, NOAA

8.3 Marine Mammal Protection Act

The various species which inhabit the management unit of this FMP that are afforded protection under the Marine Mammal Protection Act of 1972 (MMPA) are described in Section 6.4. This action is not expected to significantly alter fishing methods or activities or result in substantially increased effort that could interact with these species. The Council has reviewed the impacts of the proposed action on marine mammals and concluded that the management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management units of the subject fisheries. For further information on the potential marine mammal impacts of the fishery and the proposed management action, see Sections 6 and 7 of this Supplemental Environmental Assessment and the original EA.

8.4 Endangered Species Act

The batched fisheries Biological Opinion completed on December 16, 2013, concluded that the actions considered would not jeopardize the continued existence of any listed species. On October 17, 2017, NMFS reinitiated consultation on the batched Biological Opinion due to updated information on the decline of Atlantic right whale abundance.

Section 7(d) of the ESA prohibits Federal agencies from making any irreversible or irretrievable commitment of resources with respect to the agency action that would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternatives during the consultation period. This prohibition is in force until the requirements of section 7(a)(2) have been satisfied. Section 7(d) does not prohibit all aspects of an agency action from proceeding during consultation; non-jeopardizing activities may proceed as long as their implementation would not violate section 7(d). Per

the October 17, 2017, memo, it was concluded that allowing those fisheries specified in the batched Biological Opinion to continue during the reinitiation period will not increase the likelihood of interactions with ESA listed species above the amount that would otherwise occur if consultation had not been reinitiated. Based on this, the memo concluded that the continuation of these fisheries during the reinitiation period would not be likely to jeopardize the continued existence of any ESA listed species. Taking this, as well as our analysis of the proposed action into consideration, we do not expect the proposed action, in conjunction with other activities, to result in jeopardy to any ESA listed species.

This action does not represent any irreversible or irretrievable commitment of resources with respect to the FMP that would affect the development or implementation of reasonable and prudent measures during the consultation period. NMFS has discretion to amend its Magnuson-Stevens Act and ESA regulations and may do so at any time subject to the Administrative Procedure Act and other applicable laws. As a result, the Council has preliminarily determined that fishing activities conducted pursuant to this action will not affect endangered and threatened species or critical habitat in any manner beyond what has been considered in prior consultations on this fishery.

[8.5 Administrative Procedures Act](#)

Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

[8.6 Paperwork Reduction Act](#)

The purpose of the Paperwork Reduction Act is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. This action would not modify existing collections or require new collections.

[8.7 Coastal Zone Management Act](#)

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to the Coastal Zone Management Act regulations at 15 CFR 930.35, a negative determination may be made if there are no coastal effects and the subject action: (1) Is identified by a state agency on its list, as described in ' 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) for which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity. NMFS is reviewing applicable coastal policies of affected states and will make an appropriate determination as part of the rulemaking process.

8.8 [Section 515 \(Data Quality Act\)](#)

Pursuant to NOAA guidelines implementing section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

Utility

The information presented in this document should be helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications, as well as the Council's rationale.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage public process. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NMFS.

The [Federal Register](#) notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Greater Atlantic Regional Fisheries Office, and through the Regulations.gov website. The [Federal Register](#) documents will provide metric conversions for all measurements.

Integrity

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries adheres to the standards set out in Appendix III, Security of Automated Information Resources,⁶ of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity

For purposes of the Pre-Dissemination Review, this document is considered to be a Natural Resource Plan. Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, FMP Process; the EFH Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6A, Compliance with the National Environmental Policy Act and its Companion Manual.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Mackerel, Squid and Butterfish Monitoring Committee or other NMFS staff with expertise on the subject matter.

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the proposed action were conducted using information from the most recent complete calendar years, generally through 2017 except as noted. The data used in the analyses provide the best available information on the number of seafood dealers operating in the northeast, the number, amount, and value of fish purchases made by these dealers. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to these fisheries.

The policy choices are clearly articulated in Section 5 of this document as well as the management alternatives considered in this action. The supporting science and impact analyses, upon which the policy choices are based, are described in Sections 6 and 7 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Greater Atlantic Regional Fisheries Office, and NOAA Fisheries Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by

staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.9 Regulatory Flexibility Analysis

The purpose of the Regulatory Flexibility Act is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the Regulatory Flexibility Act requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. Section 12.0 at the end of this document includes the Regulatory Flexibility Act Analysis.

8.10 Executive Order (E.O.) 12866 (Regulatory Planning and Review)

To enhance planning and coordination with respect to new and existing regulations, this Executive Order requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be significant. Section 12.0 at the end of this document includes the Regulatory Impact Review, which includes an assessment of the costs and benefits of the proposed action, in accordance with the guidelines established by Executive Order 12866. The analysis shows that this action is not a significant regulatory action because it will not affect in a material way the economy or a sector of the economy.

8.11 Executive Order (E.O.) 13132 (Federalism)

This Executive Order established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The Executive Order also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the proposed action. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under Executive Order 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action

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10.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this document the Council consulted with the NMFS, New England and South Atlantic Fishery Management Councils, Fish and Wildlife Service, Department of State, and the states of Maine through Florida through their membership on or participation with the Mid-Atlantic, New England and/or South Atlantic Fishery Management Councils. In addition, states that are members within the management unit were consulted through the Coastal Zone Management Program consistency process.

11.0 LIST OF PREPARERS AND POINT OF CONTACT

This environmental assessment was prepared by the following member of the Council staff: Jason Didden. Review and document improvement was conducted by NMFS staff at the Greater Atlantic Regional Office in Gloucester, MA and the Northeast Fisheries Science Center in Woods Hole, MA. Questions about this environmental assessment or additional copies may be obtained by contacting Jason Didden, Mid-Atlantic Fishery Management Council, 800 N. State Street, Dover, DE 19901 (302-674-2331). This Environmental Assessment may also be accessed by visiting the NMFS Greater Atlantic Region website at <http://www.greateratlantic.fisheries.noaa.gov/regs/>.

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12.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS AND REGULATORY IMPACT REVIEW

12.1 Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA), first enacted in 1980, and codified at 5 U.S.C. 600-611, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are: 1) to increase agency awareness and understanding of the impact of their regulations on small business; 2) to require that agencies communicate and explain their findings to the public; and 3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting significant adverse impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts, while still achieving the stated objective of the action.

Basis and purpose of the rule

The basis of the rules proposed in this action are the provisions of the MSA for federal fishery management to control catches. As discretionary provisions of FMPs the MSA also allows restriction of fishing by time/season.

This action is needed avoid unnecessary negative socioeconomic impacts to fishermen that could occur if a zero possession trip limit for mackerel is implemented. The action will help ensure that optimum yield is harvested in the mackerel and herring fisheries.

- The purpose and need for this action is described in Section 4.1, while a full description of all alternatives is provided in Section 5. To assist with further evaluation of the measures proposed in this document, the following is a brief summary of the preferred alternative selected by the Council for this action:
- Alternative 2 (PREFERRED): This alternative would change the trip limit once 100% of the DAH is landed from zero pounds to 5,000 pounds.

Description and estimate of the number of small entities to which the rule applies

The measures proposed in this action apply to vessels that hold any commercial permits for Atlantic mackerel. Some small entities own multiple vessels with mackerel permits. Staff queried NMFS databases for 2017 mackerel permit holders, and then cross-referenced those results with ownership data provided by the Social Science Branch of NMFS' Northeast Fisheries Science Center. This analysis found that 1829 separate vessels held mackerel permits in 2017. In 2017 1379 entities owned those vessels, and based on current SBA definitions (under \$11 million to be a commercial fishing small business entity and \$7.5 million for for-hire operations), 1368 are small business entities. Based on revenues, 951 were commercial fishing entities, 116 were for-hire entities, and 301 had no revenue (but are considered small businesses). For those small businesses with revenues, their average revenues were \$0.6 million in 2017. There were 299 entities that reported revenue from mackerel during 2017. Of these entities, 4 were large and 295 were small.

Description and estimate of economic impacts on small entities

The economic impacts are described in Section 7.5 of this document, and summarized below for the preferred alternatives that would change management measures:

This action would increase the mackerel trip limit from zero to 5,000 pounds once 100% of the mackerel DAH is caught. As discussed in Section 7, between mackerel landings and supported herring landings, this action could increase fishery revenues by about \$3.7 million in Nov/Dec of 2018. Since this action would increase access for all permit holders, most of which are small entities, the impact on small entities is positive.

12.2 Regulatory Impact Review

INTRODUCTION

Executive Order 12866 requires a Regulatory Impact Review (RIR) in order to enhance planning and coordination with respect to new and existing regulations. This Executive Order requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." The analysis included in this RIR further demonstrates that this action is not a "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy.

Executive Order 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant regulatory action is one that may:

1. Have an annual effect on the economy of \$100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The combined mackerel and herring fisheries are worth \$50 million or less annually, and only a relatively small portion of the overall fishery may be affected by this action, as described in Section 7.5, which notes that the action may increase ex-vessel revenues by approximately \$3.7 million. As such, the proposed action should help maintain the sustainability of the mackerel and herring fisheries, and as such should positively rather than adversely affect the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities.

This action is consistent with previous actions by the Council and NOAA Fisheries, and there is no known conflict with other agencies. There is no known impact on any entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof. There is also no known conflict with other legal mandates, the President's priorities, or the principles set forth in the Executive Order.

As such, the Proposed Action is not considered significant as defined by Executive Order 12866.

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