**Mid-Atlantic Fishery Management Council**
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

August 5, 2020

Mr. Michael Pentony
Regional Administrator
National Marine Fisheries Service
Greater Atlantic Region
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Mike:

Attached please find a copy of the environmental assessment, regulatory impact review, and Regulatory Flexibility Act analysis for the Mid-Atlantic Fishery Management Council's (Council) Omnibus Risk Policy Framework action. This constitutes the Council's formal submission of this action.

Please call if you have any questions.

Sincerely,

Christopher M. Moore
Executive Director

cc: Michael Luisi, Warren Elliott, Brandon Muffley, Shannah Jaburek

# OMNIBUS Acceptable Biological Catch and Risk Policy Framework Adjustment

Fishery Management Plan Framework Numbers:
Atlantic Mackerel, Squid, and Butterfish:
Bluefish:
Summer Flounder, Scup, and Black Sea Bass:
Surfclam and Ocean Quahog:
Tilefish:
Spiny Dogfish:

## ENVIRONMENTAL ASSESSMENT (EA)

**August 2020**

**Prepared by the Mid-Atlantic Fishery Management Council**
**in cooperation with the National Marine Fisheries Service (NMFS)**


**Council Address**
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901

**NMFS Address**
Greater Atlantic Regional Office
55 Great Republic Drive
Gloucester, MA 01930


MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

**First Framework Meeting: August 14, 2019**
**Second Framework Meeting and Council Action: December 9, 2019**
**Draft EA submitted to NOAA: August 4, 2020**
**Final approved by NOAA: XXXXXXXXX**


**A Publication of the Mid-Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration (NOAA) Award No. NA10NMF4410009**

## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

In 2011, the Mid-Atlantic Fishery Management Council (Council) implemented the current risk policy and Acceptable Biological Catch (ABC) control rule to comply with the 2006 re-authorization of the Magnuson-Stevens Act (MSA) (MAFMC 2011). The risk policy specifies the Council's acceptable tolerance or level of risk (i.e., the probability of overfishing, P*) for the managed resources and works in conjunction with the Scientific and Statistical Committees (SSC) application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. The ABC recommended by the SSC is a binding upper limit on catches that will prevent overfishing. The various management measures in the fisheries work collectively to ensure that ABCs are not exceeded, which is a requirement of the MSA as currently amended.

Five years after implementation, the Council agreed to conduct a review of the current risk policy and determine if any modifications were necessary to meet the Council's goals and objectives for its managed fisheries. The elements identified by the Council for further evaluation through a possible framework action were as follows:

1. Adjustments to the maximum probability of overfishing value (P*)
2. Constant or stepped P* (i.e. remove the linear ramping)
3. Alternative/different risk policies for different life histories or species groups
4. Limiting response (+/-) in annual ABC changes
5. Formulate an Overfishing Limit (OFL) Coefficient of Variation (CV) decision document

A substantial amount of work and analyses were conducted to evaluate the five elements outlined above in order to help address stakeholder feedback and inform the Council's deliberations regarding possible modifications to the existing risk policy. This framework action specifically considers and evaluates alternatives associated with elements one and two above. Analysis conducted during this review noted no measurable benefit to implementing a different risk policy for each species, species groups, or based on different life histories; therefore, the Council agreed to retain one consistent risk policy for all managed stocks to provide a predictable process with understood outcomes (element three above). In addition, the analysis conducted as part of this action evaluated the overall range and annual change in fishery catch associated with the different alternatives, but no specific alternatives to limit the amount of change in the ABC or fishery catch was considered (element four above). Lastly, in June 2019, the Council and it's SSC addressed the fifth element above and finalized a decision document that provides detailed guidelines and outlines the process the SSC will use when considering scientific uncertainty and assigning a coefficient of variation value to the overfishing limit when making ABC recommendations for Council-managed species ( http://www.mafmc.org/s/OFL-CV-guidance-document_final-version_06_19.pdf).

During the risk policy review, the Council expressed interest in evaluating not only biological factors but to also more comprehensively consider economic and social factors and the potential associated implications of any risk policy alternatives. The Council specified that the evaluation should assess the short and long-term trade-offs between stock biomass protection, fishery yield, and economic benefits. In addition, the Council agreed that any alternatives considered would retain the biologically based foundation of the existing risk policy of specifying a probability of overfishing (P*) that is conditional on the current stock biomass (B) relative to the target biomass at maximum sustainable yield ($B_{MSY}$) and would not explicitly include but consider economic factors, targets or thresholds. The Council considered 10 different alternatives with numerous configuration covering a variety of combinations of different maximum P* limits and stock replenishment thresholds (i.e. biomass levels where P* = 0).

This omnibus action proposes to retain the current risk policy foundation with the P* for a given stock conditional on current stock biomass relative to $B_{MSY}$ ($B/B_{MSY}$) but would make modifications to the current risk policy by increasing the P* under higher stock biomass levels. Linear increases in the P* would occur as the ratio of $B/B_{MSY}$ increases to a maximum of 0.45 at the inflection point of $B/B_{MSY} = 1.0$. Once stock biomass exceeds $B_{MSY}$ and the $B/B_{MSY}$ ratio is equal to or greater than 1.0, linear increases in the P* would then occur to a maximum P* of 0.49 at the inflection point of $B/B_{MSY} = 1.5$. The maximum P* of 0.49 would then be applied when $B/B_{MSY}$ ratios are equal to or greater than 1.5. This approach seeks to prevent stocks from being overfished by reducing the probability of overfishing as stock size falls below $B_{MSY,}$ while also allowing for increased risk under high stock biomass conditions that exceed $B_{MSY}$. Consistent with the current risk policy, a P* of 0 percent (i.e., no fishing) would be set if the ratio of $B/B_{MSY}$ is less than or equal to 0.10 to ensure the stock does not reach low levels from which it cannot recover.

This action would also remove the typical/atypical species designation applied to the current risk policy. Currently, for those stocks defined as "atypical", the maximum P* is set to 0.35 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0 (species defined as "typical" have a maximum P* of 0.40). This approach was intended to provide for less risk to those species whose life histories make them more vulnerable to over-exploitation The Council's SSC would determine whether a stock is typical or atypical each time an ABC is recommended and whether or not the atypical life history has been fully addressed in the stock assessment. The atypical designation was rarely used, currently applied only to ocean quahog, and continued advancements in stock assessment and modeling approaches can more appropriately account for and address a species vulnerability to over-exploitation. Stock assessment improvements have also resulted in better quantitatively derived biological reference points to appropriately capture the unique life-history characteristics of a particular species.

Lastly, this action does not modify the Mid-Atlantic Council's application of the risk policy to stocks under a rebuilding plan or to those stocks with no overfishing limit (OFL) estimate, or OFL proxy. More information of the current risk policy application for these two scenarios can be found in Section 4.3 below.

As allowed under Council on Environmental Quality (CEQ) guidance, some information in this document is incorporated by reference. In these cases, reference information or a link is provided along with a summary of the relevant information. This document describes all evaluated management alternatives (section 5) and their expected impacts on four aspects of the affected environment, which are defined as valued ecosystem components (VECs; sections 6 and 7). The expected impacts of the alternatives on the VECs are derived from consideration of both the current conditions of the VECs and expected changes in fishing effort under each alternative.

## 1.2 Summary of Risk Policy Alternatives and Impacts

The risk policy Omnibus Framework alternatives are summarized in Tables 1 and 2 and described in more detail in section 5.0, including a detailed comparison of the alternatives using the results of a biological and economic management strategy evaluation in section 5.12. Their expected impacts on the VECs are summarized in Table 3 and described in more detail in section 7.0. To help organize the document and more clearly compare expected impacts, the alternatives are separated into two alternative sets. Alternatives 1A – 9A consider different applications and approaches to the Council's risk policy which describes the Council tolerance for overfishing of the managed resources (Table 1). Alternative 1A is the *status quo* alternative and retains the current risk policy approved by the Council in 2011 (MAFMC 2011); while Alternative 9A was selected by the Council as their preferred alternative at their December 2019 meeting. All nine alternatives retain the biologically based foundation of the existing risk policy of specifying a P* that is conditional on the current stock biomass relative to $B_{MSY}$ and would implement less risk than the maximum 50 percent probability allowed under MSA.

Alternative 2A – 2B consider retaining or removing the typical/atypical species designation within the risk policy (Table 2). Alternative 2A is the *status quo* alternative and would retain the typical/atypical designation determined by the SSC when making ABC recommendations for each species; while Alternative 2B is the Council's preferred alternative and would remove this designation and apply the same risk policy approach across all species, regardless of life-history.

**Table 1:** Brief description of the risk policy alternatives considered in this Omnibus Framework action.

| Alternative | Brief Description |
|---|---|
| 1A *Status quo* | Linear ramping with a maximum P* of 0.4 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0; stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio is equal to or less than 0.1 |
| 2A | Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0; stock replenishment threshold (i.e., no fishing, P* equal to 0) when $B/B_{MSY}$ is equal to or less than 0.1 |
| 3A | Constant P* equal to 0.40 |
| 4A | Two step P* - constant P* equal to 0.40 for $B/B_{MSY}$ ratios less than 1.0 and a constant P* of 0.45 for $B/B_{MSY}$ ratios equal to or greater than 1.0 |
| 5A | Three step P* - constant P* equal to 0.35 when the $B/B_{MSY}$ ratio is less than 0.75, constant P* of 0.40 when the $B/B_{MSY}$ ratio is between 0.75 and 1.0 and a constant P* of 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0 |
| 6A | Linear ramping with a maximum P* of 0.40 when the $B/B_{MSY}$ ratio is less than or equal to 1.0 and a linear ramping with a maximum P* of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5; stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio is equal to or less than 0.1 |
| 7A | Current risk policy with a stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio is equal to or less than 0.3 |
| 8A | Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5 and a stock replenishment threshold (P* equal to 0) when the $B/B_{MSY}$ ratio less than or equal to 0.3 |

| | |
|---|---|
| 9A<br>Preferred | Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5 and a stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio less than or equal to 0.1 |

**Table 2:** Brief description of the typical/atypical designation alternatives considered in this Omnibus Framework action.

| Alternative | Brief Description |
|---|---|
| 2A<br>*Status quo* | The SSC determines whether a stock is typical or atypical each time an ABC is recommended. Similar to the approach taken with the current risk policy for “typical” species, the P* associated with an “atypical” species is conditional on current stock biomass relative to $B_{MSY}$ but has a maximum P* set at 0.35 instead of 0.4. |
| 2B<br>Preferred | Eliminate the typical/atypical distinction in the risk policy |

The following section presents a summary of the expected impacts by alternative and cumulative for management alternatives being considered (Table 3). The impacts of each alternative, and the criteria used to evaluate them, are described in section 7. Impacts (qualitative and/or quantitative) are described in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). In section 7, the alternatives are compared to current condition of the value ecosystem component (VEC) and also compared to each other. The recent conditions of the VECs include the biological condition of the target stocks, non-target stocks, and protected species over most of the recent five years, as well as characteristics of commercial and recreational fisheries and associated human communities over the same time frame. The guidelines used to determine impacts to each VEC are described in section 7.

The actions proposed through this framework are largely administrative in nature and are not expected to have impacts on the prosecution of Council-managed fisheries, including landings levels, fishery distribution, or fishing methods and practices. The proposed action is not expected to result in changes to the manner in which Council-managed fisheries are prosecuted. However, these alternatives may have indirect impacts, particularly for managed species and the human communities VECs. Anticipated indirect impacts are summarized below.

### 1.2.1 Impacts of risk policy alternatives

*Impacts of Risk Policy Alternatives on Managed and Non-Target Species*

The alternatives considered here do not modify the existing catch limits set through the standard specification setting process, but there could be indirect impacts associated with the resulting catch limits that are derived from the future application of the Council risk policy under alternatives 2A – 9A, depending on whether the policy results in lower or higher catch levels relative to the *status quo* (Alternative 1A). However, these impacts would not be expected to depart substantially from those levels associated with *status quo*, because past precedent has established an upper limit on the risk of overfishing at a given catch level as 50 percent (USDC, 1999) which mitigates negative biological impacts to the managed resources. Future catch levels for the managed resources that result from the application of a risk policy are intended to reduce the risk of overfishing and would result in indirect long-term positive biological impacts for managed and non-target species. As such, the anticipated indirect biological impacts associated with Alternatives 2A – 9A, would be neutral to slight positive, when compared to the *status quo*.

When compared to each other, the *status quo* and Alternative 7A, have the lowest average level of risk, the lowest average catch levels and would result in highest positive impacts for managed and non-target species. This would be followed by the remaining ramped alternatives (Alternatives 2A, 6A, 8A, and 9A) which limit the risk of overfishing across all scenarios considered. The constant or stepped alternatives (Alternatives 3A, 4A, and 5A) would have the lowest positive impact.

*Impacts of Risk Policy Alternatives on Physical Habitat*

The risk policy alternatives (1A – 9A) are administrative and procedural in nature and consider a variety of approaches to specify the level of risk to overfishing under different stock biomass conditions but do not specify commercial or recreational catch levels for Council-managed fisheries. There could be indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternatives 2A – 9A, however these potential changes in effort are not be expected to depart substantially from those levels associated with *status quo* (Alternative 1A). Therefore, none of the alternatives are expected to impact the fleet dynamics and fishing effort of Council-managed fisheries and unlikely to further degrade habitat beyond its current state. As such, all alternatives evaluated would have similar indirect habitat impacts.

*Impacts of Risk Policy Alternatives on Protected Resources*

Similar to the conclusion on habitat, the alternatives considered here are administrative and procedural in nature and will likely have little effect on fleet dynamics or fishing effort. While there could be indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternatives 2A – 9A, these potential changes in effort are not be expected to depart substantially from those levels associated with *status quo* (Alternative 1A). Therefore, it is anticipated that these alternatives will likely have no direct impact on current protected resource conditions but would allow for continued recreational and commercial operations which will continue to interact with protected species and result in takes of those species.

*Socioeconomic Impacts of Risk Policy Alternatives*

The alternatives considered here do not modify existing commercial quotas or recreational harvest limits for Council-managed fisheries and, therefore, will not have any direct socioeconomic impacts. The alternatives evaluated here consider the amount of risk to overfishing under future stock biomass conditions and future catch limits derived from the application of a Council risk policy under alternatives 2A – 9A may result in lower or higher catch levels relative to the *status quo* (Alternative 1A). Therefore, the anticipated indirect socioeconomic impacts associated with Alternatives 2A – 9A, would range from slight negative to slight positive, when compared to the *status quo*.

When compared to each other, in general, the constant or stepped alternatives (Alternatives 3A, 4A, and 5A) result in the highest average catch levels and economic welfare and would have the greatest positive socioeconomic impact. This would be followed most of the ramped alternatives, including Alternative 2A, 6A, 8A, and 9A. The *status quo* alternative (Alternative 1A) followed by Alternative 7A have the lowest average catch and economic welfare and the lowest positive socioeconomic impact.

### 1.2.2 Impacts of typical/atypical designation alternatives

*Impacts of Typical/Atypical Designation Alternatives on Managed and Non-Target Species*

The typical/atypical designation alternatives are administrative in nature and do not modify existing catch limits for Council-managed fisheries. Under Alternative 2A (*status quo*), during each ABC recommendation, the SSC would continue to designate a stock as typical/atypical based on stock assessment results and, if designated as atypical, a lower probability of overfishing would be implemented in the risk policy. Alternative 2B would remove this designation and the same application of the risk policy would apply to all species, regardless of life-history. While Alternative 2B could result in potentially higher catches for a species when compared to the *status quo*, the atypical designation has only been applied to ocean quahog and the upper limit on the risk of overfishing is capped at 50 percent. Therefore, catch levels and associated impacts are expected to be similar between the two alternatives. Future catch levels under both alternatives are intended to limit the risk of overfishing and would result in indirect long-term positive biological impacts for managed and non-target species.

When compared to one another, Alternative 2A would implement a lower risk of overfishing and lower catches if deemed appropriate by the SSC for atypical stocks and would result in higher positive biological impacts for managed and non-target species compared to Alternative 2B.

*Impacts of Typical/Atypical Designation Alternatives on Physical Habitat*

The typical/atypical designation alternatives (1B – 2B) are administrative and procedural in nature and consider the level of risk to overfishing for species designated by the SSC as atypical but do not specify commercial or recreational catch levels for Council-managed fisheries. There could be indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternative 2B; however this atypical designation has only been applied to ocean quahog and the potential changes in effort are not be expected to depart substantially, if at all, from those levels associated with *status quo* (Alternative 1B). Therefore, neither alternative is expected to impact the fleet dynamics and fishing effort of Council-managed fisheries and unlikely to further degrade habitat beyond its current state. As such, both alternatives evaluated would have similar indirect habitat impacts.

*Impacts of Typical/Atypical Designation Alternatives on Protected Resources*

Similar to the conclusion on habitat, the alternatives considered here are administrative and procedural in nature and will likely have little effect on fleet dynamics or fishing effort. While there could be indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternative 2B, these potential changes in effort are not be expected to depart substantially, if at all, from those levels associated with *status quo* (Alternative 2A). Therefore, it is anticipated that both alternatives will likely have no direct impact on current protected resource conditions but would allow for continued recreational and commercial operations which will continue to interact with protected species and result in takes of those species.

*Socioeconomic Impacts of Typical/Atypical Designation Alternatives*

The alternatives considered here do not modify existing commercial quotas or recreational harvest limits for Council-managed fisheries and, therefore, will not have any direct socioeconomic impacts. The alternatives evaluated here consider designating a stock as typical/atypical by the SSC when making ABC recommendations and reducing the amount of risk to overfishing for a stock designated as atypical. The atypical designation has only been applied to ocean quahog and its anticipated that future catch levels are expected to be very similar between the two alternatives. However, Alternative 2B could result in potentially higher catches limits for a species (e.g., ocean quahog) when compared to the *status quo*, and could result in slightly positive socioeconomic impacts.

**Table 3:** Expected impacts of the risk policy alternatives (1A-9A) and the typical/atypical designation alternatives (2A-2B), on each VEC, relative to current conditions. A minus sign (–) signifies a negative impact and a plus sign (+) signifies a positive impact. "Mod" refers to a moderate impact and "Sl" refers to a slight impact. None of the impacts are expected to be significant. Cells are shaded to show relative rankings of the alternatives from greatest positive/least negative to least positive/most negative expected impacts on each VEC. Green refers to the most positive/least negative, followed in order by yellow, orange, and red. All expected impacts are described in detail in section 7.

| Alternative | Managed and Non-Target Species | Habitat | Protected Species | Human Communities |
|---|---|---|---|---|
| 1A (*Status quo*) | + | No Impact | No Impact | Neutral |
| 2A | Sl+ | No Impact | No Impact | Sl+ |
| 3A | Sl+ | No Impact | No Impact | Sl+ |
| 4A | Sl+ | No Impact | No Impact | Sl+ |
| 5A | Sl+ | No Impact | No Impact | Sl+ |
| 6A | Sl+ | No Impact | No Impact | Sl+ |
| 7A | + | No Impact | No Impact | Neutral to Sl- |
| 8A | Sl+ | No Impact | No Impact | Sl+ |
| 9A (Preferred) | Sl+ | No Impact | No Impact | Sl+ |
| 1B (*Status quo*) | + | No Impact | No Impact | Neutral |
| 2B (Preferred) | Sl+ | No Impact | No Impact | Sl+ |

## 1.3 Cumulative Impacts

The Council analyzed the impacts of all alternatives on the biological environment, physical habitat, protected species, and human communities. When the proposed action (i.e., all preferred alternatives) is considered in conjunction with all other impacts from past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative; therefore, no significant cumulative effects on the human environment are associated with the proposed action (section 7.3).

### 1.4 Conclusions

A description of the expected environmental impacts and any cumulative impacts resulting from each of the alternatives are provided in section 7. The preferred alternatives are not associated with significant impacts to the biological, socioeconomic, or physical environment, individually or in conjunction with other actions; therefore, a "Finding of No Significant Impact" is warranted.

## 2.0 LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ABC | Acceptable Biological Catch |
| ACL | Annual Catch Limit |
| ACT | Annual Catch Target |
| ALWTRP | Atlantic Large Whale Take Reduction Plan |
| AM | Accountability Measure |
| AO | Administrative Order |
| AP | Advisory Panel |
| ASM | At Sea Monitoring Program |
| ASMFC | Atlantic States Marine Fisheries Commission |
| ATGTRS | Atlantic Trawl Gear Take Reduction Strategy |
| ATGTRT | Atlantic Trawl Gear Take Reduction Team |
| B | Biomass |
| $B_{MSY}$ | Biomass at Maximum Sustainable Yield |
| CEA | Cumulative Effects Analysis |
| CFR | Code of Federal Regulations |
| Council | Mid-Atlantic Fishery Management Council |
| CPUE | Catch Per Unit Effort |
| CV | Coefficient of Variation |
| DPS | Distinct Population Segment |
| EA | Environmental Assessment |
| EEZ | Exclusive Economic Zone |
| EFH | Essential Fish Habitat |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| ESA | Endangered Species Act |
| F | Fishing Mortality Rate |
| $F_{MSY}$ | Fishing Mortality Rate at Maximum Sustainable Yield |
| $F_{REBUILD}$ | Rebuilding Fishing Mortality Rate |
| FMP | Fishery Management Plan |
| FR | Federal Register |
| FONSI | Finding of No Significant Impact |
| GARFO | Greater Atlantic Regional Fisheries Office |
| ITS | Incidental Take Statement |
| MAFMC | Mid-Atlantic Fishery Management Council |
| MMPA | Marine Mammal Protection Act |
| MRIP | Marine Recreational Information Program |
| MSA | Magnuson-Stevens Fishery Conservation and Management Act |
| MSB | Atlantic Mackerel, Squids, and Butterfish |
| MSY | Maximum Sustainable Yield |
| NAO | National Oceanic and Atmospheric Administration Administrative Order |
| NEFMC | New England Fishery Management Council |
| NEFSC | Northeast Fisheries Science Center |
| NEFOP | Northeast Fisheries Observer Program |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| NRCC | Northeast Region Coordinating Council |
| OFL | Overfishing Limit |
| OY | Optimum Yield |

| | |
|---|---|
| P* | Probability of Overfishing |
| PBR | Potential Biological Removal |
| PRA | Paperwork Reduction Act |
| RHL | Recreational Harvest Limit |
| SARC | Stock Assessment Review Committee |
| SAW | Stock Assessment Workshop |
| SBA | Small Business Administration |
| SSB | Spawning Stock Biomass |
| $SSB_{MSY}$ | Spawning Stock Biomass at Maximum Sustainable Yield |
| SSC | Scientific and Statistical Committee |
| USFWS | United States Fish and Wildlife Service |
| VECs | Valued Ecosystem Components |
| VTR | Vessel Trip Report |

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## 4.0 INTRODUCTION AND BACKGROUND

### 4.1 Purpose and Need for the Action

This action is necessary to address two issues that have been identified with the current application of the Council's risk policy. The issues are:

1. While the current risk policy has generally performed well and helped the Council achieve many biological management objectives, it does not consider the potential social and economic implications and socioeconomic management objectives. Recent science and modeling advances have provided an opportunity to comprehensively evaluate the short- and long-term trade-offs between stock biomass risk and protection, fishery yield, and economic benefits of different risk policy alternatives. The purpose of this framework action is to consider changes to the current risk policy continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels.

2. Once a stock reaches the biomass target ($B_{MSY}$ or $B_{MSY}$ proxy), the current risk policy applies the same level of risk (i.e. probability of overfishing equal to 40%) even if a particular stock may be substantially above the biomass target. This approach likely results unnecessary foregone yield and lost economic benefits to the fishery. The purpose of this action is to allow for increased risk under very high stock biomass conditions, such as those currently found with scup and black sea bass, and provide for increased opportunities and access to a robust stock and provide for increased fishery yield and greater economic benefits.

### 4.2 History of Fishery Management Plan Development

The Fishery Management Plans (FMPs) managed by the Council have all been in place for a number of years and modified a number of times. The original FMPs were begun for the various Council-managed species in the following years:

- Surfclam and Ocean Quahog – 1977
- Mackerel – 1978
- Longfin and *Illex* Squid – 1978
- Butterfish – 1978
- Summer Flounder – 1988
- Bluefish – 1990
- Scup – 1996
- Black Sea Bass – 1996
- Spiny Dogfish – 2000
- Golden Tilefish – 2001
- Blueline Tilefish – 2017
- Chub mackerel – 2020

Collectively there have been over 90 Amendments and Frameworks to these Fishery Management Plans (all available at http://www.mafmc.org/fishery-management-plans) and the specifications for annual quotas often make minor management changes as well. The details of the changes in the various Amendment and Frameworks may be found at the above web link, but generally changes have included measures designed to avoid overfishing, rebuild stocks, address allocation issues, identify and reduce impacts on essential fish habitat (EFH), reduce bycatch, establish permitting and reporting requirements, and coordinate management among regional partners like the Atlantic States Marine Fisheries Commission (ASMFC) and the New England Fishery Management Council (NEFMC). The official regulations for all Council-managed species can be found at: https://www.law.cornell.edu/cfr/text/50/part-648.

For the purposes of this Omnibus Framework, the key historical action is the 2011 Omnibus Amendment that established Annual Catch Limits (ACLs) and Accountability Measures (AMs) (MAFMC 2011) for all Council-managed resources. ACLs and AMs were required under the 2007 reauthorization of the MSA, and the operational issue was that the Council had to set ACLs that could not exceed the recommendation of the Council's SSC to prevent overfishing. These recommendations are called Acceptable Biological Catches (ABCs) and represent an upper limit for the Council when setting catch and landings limits. In the Omnibus ACL/AM Amendment, the Council developed a risk policy that guides the SSC in terms on how much risk of overfishing the Council is willing to accept when the SSC develops ABC recommendations. Previous lawsuits have determined that the risk of overfishing cannot exceed 50 percent, and the Council's risk policy implemented with the ACL/AM Omnibus Amendment is described in the section below.

The Council has modified the risk policy and ABC control rule on a couple of occasions since 2011 to address some technical issues and provide for some additional flexibility under specified circumstances. In 2012, Framework 6 to the Mackerel-Squid-Butterfish (MSB) Fishery Management Plan modified the original risk policy to provide additional flexibility for stocks without accepted overfishing information (MAFMC 2012). In 2018, an Omnibus Framework action (Framework11 to the MSB Fishery Management Pan) established a process to specify constant multi-year ABCs to provide additional fishery stability. This framework also clarified the process and further defined the four different types of ABC control rules considered by the SSC (MAFMC 2018).

## 4.3 Overview of Council Risk Policy and ABC Control Rule

*Risk Policy*

Under the current risk policy, the Council's acceptable probability of overfishing (P*) for a given stock is conditional on current stock biomass (B) relative to the biomass at maximum sustainable yield ($B_{MSY}$) and the life history of the species (Figure1). The P* is 0 percent (i.e., no fishing) if the ratio of $B/B_{MSY}$ is less than or equal to a stock replenishment threshold of 0.10 to ensure the stock does not reach low levels from which it cannot recover. The probability of overfishing increases linearly for stocks defined as "typical" as the ratio of $B/B_{MSY}$ increases, until the inflection point of $B/B_{MSY}$ = 1.0 is reached (i.e., current stock biomass greater than $B_{MSY}$). A maximum 40 percent probability of overfishing (P* = 0.4) is utilized for ratios equal to or greater than 1.0. The same approach applies to those stocks defined as "atypical", currently applied to ocean quahog, except the maximum probability of overfishing when the $B/B_{MSY}$ ratio is equal to or greater than 1.0 is 35 percent (P* = 0.35). The Council's SSC determines whether a stock is typical or atypical each time an ABC is recommended and whether or not the atypical life history has been fully addressed in the stock assessment.

In addition, for managed stocks that are under a rebuilding plan, the upper limit on the probability of exceeding $F_{REBUILD}$ would be 50 percent unless modified to a lower value (i.e., a higher probability, 75 percent for example, of not exceeding $F_{REBUILD}$) through a rebuilding plan amendment. If the SSC recommends a more restrictive ABC, based on the application of the Council's risk policy and ABC control rule, than the ABC derived from the use of the Council specified $F_{REBUILD}$, the SSC recommends the lower of the ABC values. Also, if no OFL is available and no OFL proxy is provided by the SSC when making an ABC recommendation, a cap on the allowable increases to the ABC is established. The ABC may not be increased until and OFL has been identified. This action does not modify these components to the risk policy.

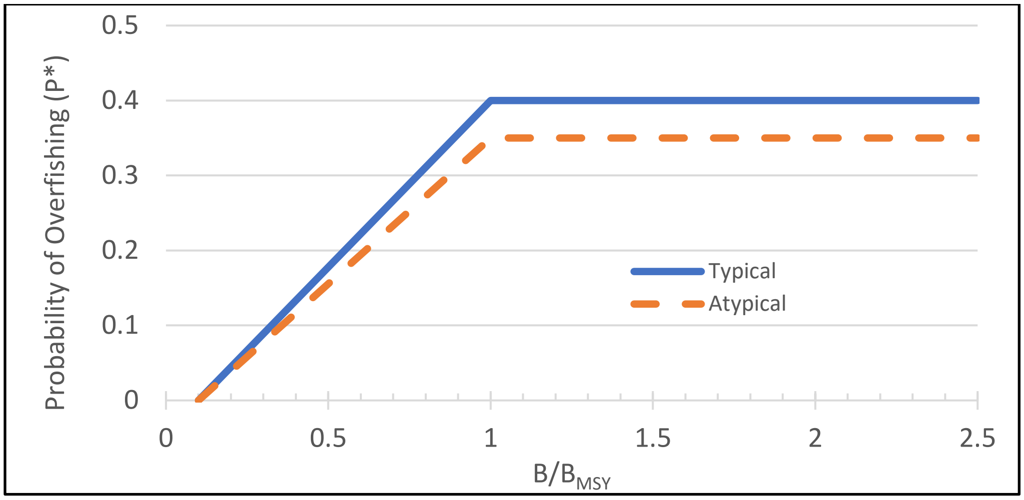



**Figure 1.** The Mid-Atlantic Fishery Management Council risk policy on overfishing.

*ABC Control Rule*

The current ABC control rule utilizes a multi-level approach in setting an ABC that is based on the overall level of scientific uncertainty associated with each species stock assessment. This approach identifies four types of overall stock assessment uncertainty defined by characteristics of the stock assessment and other relevant information. The SSC determines which control rule type the assessment for a particular stock belongs when setting ABC specifications. Then the processes described within each type are used to calculate ABC. The SSC's assessment of how uncertainty is handled by assessments affects the final ABC determination in terms of how much of a buffer is used to lower the ABC from the point estimate of the OFL. The four control rule types are summarized below.

- **Type 1 – Analytically-based ABC from stock assessment:** all important sources of uncertainty are fully and formally captured in the stock assessment model and the probability distribution of the OFL (OFL CV) estimated directly from the stock assessment is used. Under this level, the ABC will be determined solely on the basis of a P*, determined by the Council's risk policy, and the probability distribution of the OFL from the assessment. Currently, no Mid-Atlantic stocks are in this control rule type.
- **Type 2 – Expert-based ABC:** this level assessment has greater uncertainty than the analytically-based control rule type. Specifically, the estimation of the probability

distribution of the OFL directly from the stock assessment model does not include some important sources of uncertainty, necessitating expert judgement by the assessment team during the stock assessment process to develop a probability distribution of the OFL. The OFL probability distribution developed during the assessment then needs to be deemed as best available science by the SSC. In this level, the ABC will be determined by using the Council's risk policy (P*) but with the OFL probability distribution based on the specified distribution in the stock assessment. Currently, no Mid-Atlantic stocks are in this control rule type.

- **Type 3 – Empirically-based ABC:** attributes of a stock assessment are the same as the expert-based control rule type, except the assessment does not contain estimates of the probability distribution of the OFL or the probability distribution provided does not, in the opinion of the SSC, adequately reflect uncertainty in the OFL estimate. The SSC then adjusts the distribution of the OFL and develops an ABC recommendation by applying the Council's risk policy (P*) to the modified OFL probability distribution. The majority of the Mid-Atlantic stocks fall under this control rule type.
- **Type 4 – Catch-based ABC:** assessments are deemed to have reliable estimates of trends in abundance and catch, but absolute abundance, fishing mortality rates, and reference points cannot be developed. Stocks in this level do not have point estimates of the OFL or probability distributions of the OFL that are considered best available science. For stocks in this level, the SSC will use ad hoc types of control rules based on biomass and catch history and the Council's risk policy. Longfin squid and *Illex* squid currently fall under this level.

The above summarizes the current regulations governing the setting of ABCs, and both the ABC control rule section (648.20) and the risk policy section (648.21) guide the SSC in making ABC recommendations.

In summary, the amount of scientific uncertainty that the SSC assigns to any OFL estimate also impacts the amount of the buffer and resulting ABC. The more uncertain an OFL is deemed to have, the greater the buffer. The SSC can use the amount of uncertainty in the OFL as produced by a stock assessment (Type 1 above). However, to date the SSC has always expanded the produced uncertainty measures (CV) because not all uncertainties are fully captured in the assessment calculations (Type 3 above). This expansion increases the buffers and decreases ABCs. Thus a buffer can be larger (and ABC smaller) either because the Council wants a lower risk of overfishing (P*) and/or because the SSC determines that to actually achieve a given risk a higher degree of scientific uncertainty must be assumed and catch must be lowered.

## 4.4 Management Unit and Management Objectives in Council FMPs

The management unit and management objectives for each Fishery Management Plan (FMP) are described below. The Council has recently modified management objectives for some FMPs and is currently reviewing and possibly amending the FMP objectives for others over the next several years.

### 4.4.1 Surfclam and Ocean Quahog FMP

The management unit is all Atlantic surfclams (*Spisula solidissima*) and ocean quahogs (*Arctica islandica*) in the Atlantic EEZ. The ocean quahogs managed in this FMP include a small-scale fishery in eastern Maine that harvests small ocean quahogs which are generally sold for the half-shell market. Locally these small ocean quahogs off the coast of Maine are known as “mahogany quahogs” and have been under Council management since implementation of Amendment 10 (MAFMC 1998). There is no scientific question that the small scale Maine fishery occurs on *Arctica islandica*.

In December 2019, the Council took final action to approve modifications to the Atlantic Surfclam and Ocean Quahog FMP goals and objectives to better reflect the Council's long-term intent for these fisheries. A proposed rule with the changes to the goals and objectives will occur sometime in mid-2020. Since those are not yet in place, the current management objectives of the Atlantic Surfclam and Ocean Quahog FMP are provided below:

1) Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2) Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.
3) Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4) Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

### 4.4.2 Atlantic Mackerel, Squids, and Butterfish FMP

The management unit is all northwest Atlantic mackerel (*Scomber scombrus*), *Loligo pealei*, *Illex illecebrosus*, and butterfish (*Peprilus tricanthus*) under U.S. jurisdiction. The existing FMP goals and objectives have not been revised since they were originally established and are currently being reconsidered in a current Council action. Since potential changes are unknown at this time, the current management objectives of the Atlantic Mackerel, Squids, and Butterfish FMP are provided below:

1) Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2) Promote the growth of the U.S. commercial fishery, including the fishery for export.
3) Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4) Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5) Increase understanding of the conditions of the stocks and fisheries.
6) Minimize harvesting conflicts among U.S. commercial, U.S. recreational, and foreign fishermen.

In 2019, the Council approved an amendment to add Atlantic chub mackerel (*Scomber colias*) to the Mackerel, Squids, and Butterfish FMP (additional information regarding the amendment process can be found at: https://www.mafmc.org/actions/chub-mackerel-amendment). The NMFS published a proposed rule in March 2020 (proposed rule), with the final rule and implementation anticipated sometime in the summer of 2020. The management unit for chub mackerel will include the federal waters off of Maine through North Carolina. The Council determined the current Mackerel, Squids, and Butterfish FMP goals and objectives listed above are not appropriate for chub mackerel and adopted a separate set of goals and objectives for chub mackerel, listed below:

1) Maintain a sustainable chub mackerel stock.
    - *Objective 1.1:* Prevent overfishing and achieve and maintain sustainable biomass levels that achieve optimum yield in the fisheries and meet the needs of chub mackerel predators.
    - *Objective 1.2:* Consider and account for, to the extent practicable, the role of chub mackerel in the ecosystem, including its role as prey, as a predator, and as food for humans.

2) Optimize economic and social benefits from utilization of chub mackerel, balancing the needs and priorities of different user groups.
    - *Objective 2.1:* Allow opportunities for commercial and recreational chub mackerel fishing, considering the opportunistic nature of the fisheries, changes in availability that may result from changes in climate and other factors, and the need for operational flexibility.
    - *Objective 2.2:* To the extent practicable, minimize additional limiting restrictions on the *Illex* squid fishery.
    - *Objective. 2.3:* Balance social and economic needs of various sectors of the chub mackerel fisheries (e.g., commercial, recreational, regional) and other fisheries, including recreational fisheries for highly migratory species.

3) Support science, monitoring, and data collection to enhance effective management of chub mackerel fisheries.
    - *Objective 3.1:* Improve data collection to better understand the status of the chub mackerel stock, the role of chub mackerel in the ecosystem, and the biological, ecological, and socioeconomic impacts of management measures, including impacts to other fisheries.
    - *Objective 3.2:* Promote opportunities for industry collaboration on research.

### 4.4.3 Summer Flounder, Scup, and Black Sea Bass FMP

The management unit for summer flounder (*Paralichthys dentatus*) is the U.S. waters in the western Atlantic Ocean from the southern border of North Carolina northward to the U.S.-Canadian border. The management unit for both scup (*Stenotomus chrysops*) and black sea bass (*Centropristis striata*) is the U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the U.S.-Canadian border. In 2019, the Council and ASMFC took final action to revise the FMP objectives for summer flounder. It is anticipated a proposed rule with the changes to the summer flounder objectives will occur sometime in mid-2020. The current management objectives of the Summer Flounder, Scup, Black Sea Bass FMP are as follows:

1) Reduce fishing mortality in the summer flounder, scup and black sea bass fisheries to ensure that overfishing does not occur.
2) Reduce fishing mortality on immature summer flounder, scup, and black sea bass to increase spawning stock biomass.
3) Improve the yield from the fishery.
4) Promote compatible management regulations between state and federal jurisdictions.
5) Promote uniform and effective enforcement of regulations.
6) Minimize regulations to achieve the management objectives stated above.

### 4.4.4 Atlantic Bluefish

The management unit is bluefish (*Pomatomus saltatrix*) in U.S. waters of the western Atlantic Ocean. The Council and ASMFC are currently developing an amendment that will review and consider modifications to the bluefish FMP goals and objectives. The current management objectives of the Atlantic Bluefish FMP are as follows:

1) Increase understanding of the stock and of the fishery.
2) Provide the highest availability of bluefish to U.S. fishermen while maintaining, within limits, traditional uses of bluefish.
3) Provide for cooperation among the coastal states, the various regional marine fishery management councils, and federal agencies involved along the coast to enhance the management of bluefish throughout its range.
4) Prevent recruitment overfishing.
5) Reduce the waste in both the commercial and recreational fisheries.

### 4.4.5 Spiny Dogfish

The management unit is the entire spiny dogfish (*Squalus acanthias*) population along the Atlantic coast of the United States. The management goals and objectives have remained unchanged since the implementation of the original spiny dogfish FMP in 2000. The management objectives of the Spiny Dogfish FMP are as follows:

1) Reduce fishing mortality to ensure that overfishing does not occur.
2) Promote compatible management regulations between state and Council jurisdictions and the U.S. and Canada.
3) Promote uniform and effective enforcement of regulations.
4) Minimize regulations while achieving the management objectives stated above.
5) Manage the spiny dogfish fishery so as to minimize the impact of the regulations on the prosecution of other fisheries, to the extent practicable.
6) Contribute to the protection of biodiversity and ecosystem structure and function.

### 4.4.6 Tilefish FMP

The Tilefish FMP implemented management measures for golden tilefish (*Lopholatilus chamaelonticeps*) and blueline tilefish (*Caulolatilus microps*) from Virginia through Maine. The management unit for this FMP includes all U.S. federal waters north of the NC/VA border. Tilefish south of the Virginia/North Carolina border are currently managed by the South Atlantic Fishery Management Council as part of the FMP for the Snapper-Grouper Fishery. The management objectives of the Tilefish FMP are as follows:

1) Prevent overfishing and rebuild the resource to the biomass that would support MSY.

2) Prevent overcapitalization and limit new entrants.
3) Identify and describe essential tilefish habitat.
4) Collect necessary data to develop, monitor, and assess biological, economic, and social impacts of management measures designed to prevent overfishing and to reduce bycatch of tilefish in all fisheries.

## 5.0 MANAGEMENT ALTERNATIVES

The management regimes and associated management measures within the Fishery Management Plans (FMPs) for the managed resources have been refined over time and codified in regulation. Given that the risk policy and control rule provisions do not need to be re-specified each year in the event no further action has yet been taken, the relevant no action or *status quo* management measures for the managed resources therefore involve a set of indefinite (i.e., in force until otherwise changed) measures that have been established. These measures will continue as they are even if the actions contained within this framework are not taken (i.e., no action). While not all species' individual specifications roll over from year to year, since they will be re-specified each year through other Council actions regardless of this action, the no action alternative for these managed resources is therefore equivalent to *status quo*. On that basis, the no action/*status quo* is presented in conjunction for comparative impact analysis relative to the action alternatives.

The Council risk policy alternatives given below would be applied all to the managed resources under MAFMC management jurisdiction. Under any of the action risk alternatives selected below, the existing language on the application of the risk policy to stocks under a rebuilding plan or for those stocks with no OFL, or OFL proxy, would remain as currently implemented (see additional detail in Section 4.3 above).

It should be noted in the alternatives below that if the ratio of B to $B_{MSY}$ is less than 1.0, then the current stock biomass is less than $B_{MSY}$; if the ratio of B to $B_{MSY}$ is greater than or equal to 1.0, then the current stock biomass is $B_{MSY}$ or greater.

### 5.1 Alternative 1A: *Status quo*/No action, overall risk policy

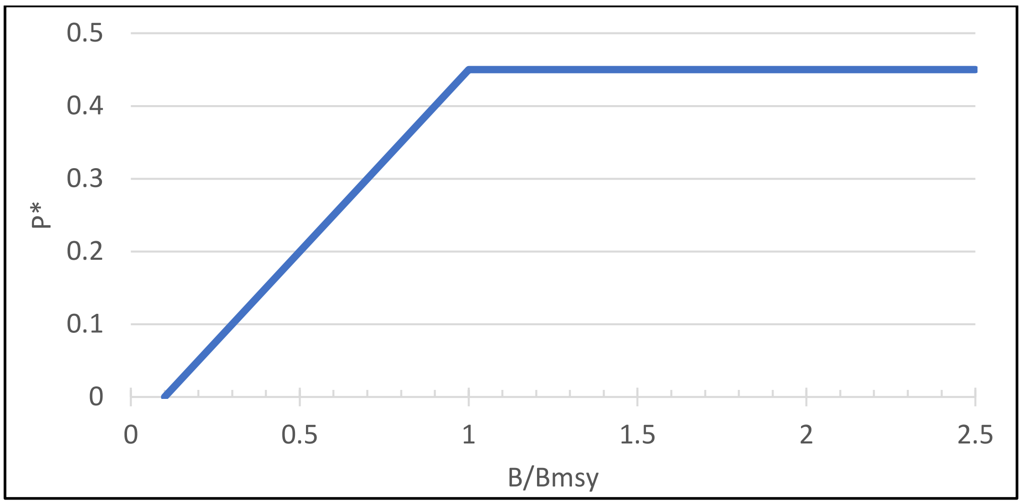
This alternative would retain the existing risk policy with the acceptable probability of overfishing (P*) for a given stock conditional on current stock biomass relative to $B_{MSY}$ and a maximum P* set at 0.4 (Figure1). The stock replenishment threshold defined as the ratio of $B/B_{MSY}$ = 0.10, is utilized to ensure the stock does not reach low levels from which it cannot recover. The probability of overfishing is 0 percent (i.e., no fishing) if the ratio of $B/B_{MSY}$ is less than or equal to 0.10. The P* increases linearly as the ratio of $B/B_{MSY}$ increases, until the inflection point of $B/B_{MSY}$ = 1.0 is reached. A maximum P* of 0.4 is utilized for ratios equal to or greater than 1.0.

### 5.2 Alternative 2A: Linear ramping with a maximum P* of 0.45 when the B/BMSY ratio is equal to or greater than 1.0

Under this alternative, the Council would assume a higher level of risk (P*=0.45) than the current policy (P*=0.40) in cases where the stock biomass was greater than the $B_{MSY}$ target. Under this alternative, the P* would be variable and conditioned on current stock biomass when stock size falls below $B_{MSY}$ as per the current risk policy but would be held constant at 0.45 when stock size exceeds $B_{MSY}$ (Figure 2A). The maximum P* of 0.45 is higher than the current Council risk policy but is lower than the 0.50 maximum allowed under the MSA.

A P* of 0 percent if the ratio of $B/B_{MSY}$ is less than or equal to 0.10 would remain to ensure a stock does not reach low levels from which it cannot recover. It is worth noting that by increasing the maximum P* to 0.45 under this alternative, the slope of linear ramping portion to determine a P* for stocks whose biomass is less than $B_{MSY}$ is also modified (Figure 2B). Therefore, when compared to the current risk policy, this alternative would result in slightly higher P* values (higher risk of overfishing) under the same current stock biomass when less than $B_{MSY}$.

**A)**




**B)**

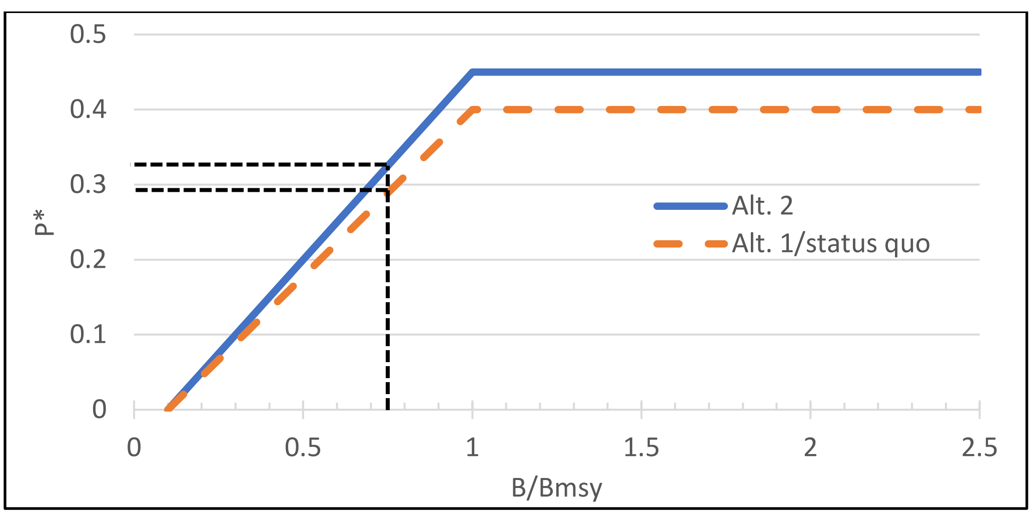



**Figure 2: A)** Alternative 2A with a variable probability of overfishing (P*) up to a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0. **B)** Comparison between

Alternative 1A/*status quo* (typical life history) and Alternative 2A. Dashed lines show the difference between the two alternatives in the P* calculation under the same biomass ratio.

### 5.3 Alternative 3A: Constant P* equal to 0.40

Under this alternative, the variable P* as a function of stock biomass would be removed and a constant P* equal to 0.4, the current maximum P* value, would be maintained under all circumstances (Figure 3). The P* of 0.4 would be applied regardless of current stock biomass, rebuilding status, life history etc. The current ramping of the P* conditioned on biomass is an attempt to prevent stocks from being overfished by reducing the probability of overfishing as stock size falls below $B_{MSY}$. However, this feature of the current risk policy is not a mandatory requirement of the MSA.

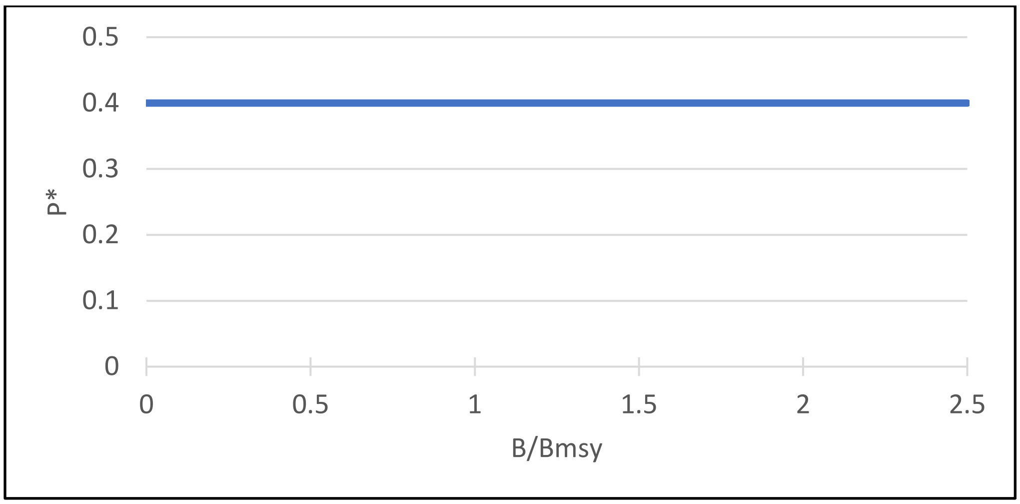



**Figure 3:** Alternative 3A with a constant P* equal to 0.40 under all stock biomass conditions.

### 5.4 Alternative 4A: Two step P* - constant P* equal to 0.40 for $B/B_{MSY}$ ratios less than 1.0 and a constant P* at 0.45 for $B/B_{MSY}$ ratios equal to or greater than 1.0

Under this alternative, current stock biomass relative to $B_{MSY}$ would be considered but instead of applying a variable P* associated with the current policy, a constant P* equal to 0.40 or 0.45 would be applied depending upon the $B/B_{MSY}$ ratio (Figure 4). For stocks whose biomass is less than $B_{MSY}$ ($B/B_{MSY}$ ratio less than 1.0), a constant P* equal to 0.40, the current maximum P* value, would be applied. For stocks whose biomass is equal to or greater than $B_{MSY}$ ($B/B_{MSY}$ ratio equal to or greater than 1.0), a constant P* equal to 0.45 would be applied. This maximum P* value is higher than the current Council risk policy maximum but lower than the 0.50 maximum allowed under the MSA.

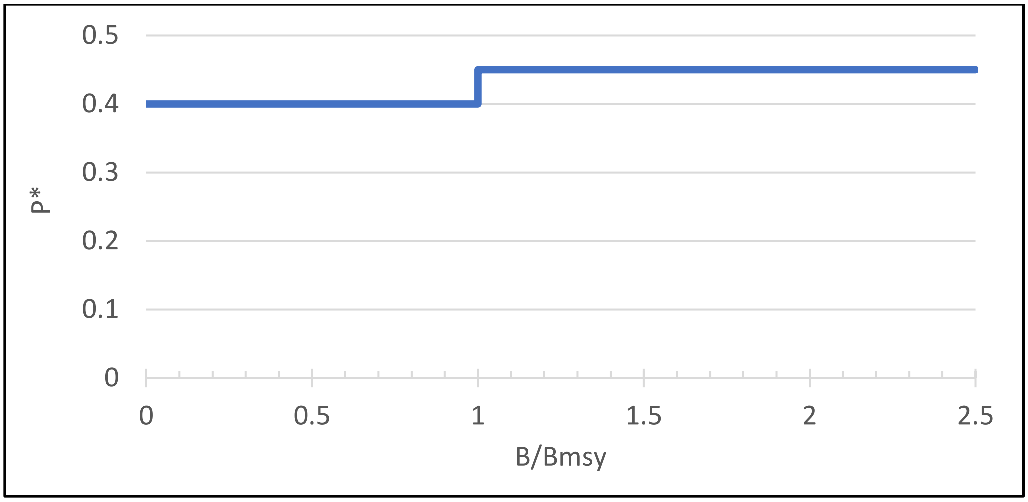



**Figure 4:** Alternative 4A with a two-step P* with a constant P* equal to 0.40 when the $B/B_{MSY}$ ratio is less than 1.0 and a constant P* equal to 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0.

### 5.5 Alternative 5A: Three step P* - constant P* equal to 0.35 when the $B/B_{MSY}$ ratio is less than 0.75, constant P* of 0.40 when the $B/B_{MSY}$ ratio is between 0.75 and 1.0 and a constant P* of 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0

Similar to Alternative 4A, under this alternative, current stock biomass relative to $B_{MSY}$ would be considered but instead of applying a variable P* associated with the current policy, a constant P* equal to 0.35, 0.40 or 0.45 would be applied depending upon the $B/B_{MSY}$ ratio (Figure 5). For stocks whose biomass is more than 25 percent below $B_{MSY}$ ($B/B_{MSY}$ ratio less than 0.75), a lower risk would be assumed and a constant P* equal to 0.35 would be applied. When stock biomass is less than $B_{MSY}$ but equal to or less than 25 percent below $B_{MSY}$ ($B/B_{MSY}$ ratio equal to or greater than 0.75 but less than 1.0), a constant P* of 0.40 would be applied. For stocks whose biomass is equal to or greater than $B_{MSY}$ ($B/B_{MSY}$ ratio equal to or greater than 1.0), a higher risk would be assumed and a constant P* equal to 0.45 would be applied. This alternative considers current stock biomass and would implement a lower risk tolerance under lower stock biomass conditions and increasing risk with increasing stock biomass.

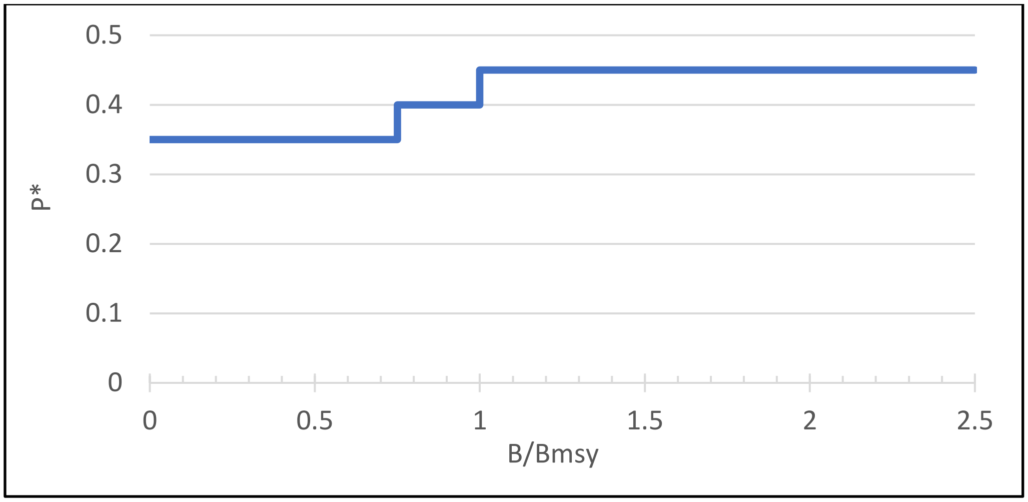



**Figure 5:** Alternative 5A with a three-step P* with a constant P* equal to 0.35 when the $B/B_{MSY}$ ratio is less than 0.75, a constant P* equal to 0.40 when the $B/B_{MSY}$ ratio is greater than or equal to 0.75 but less than 1.0, and a P* equal to 0.45 when the $B/B_{MSY}$ ratio is greater than or equal to 1.0.

### 5.6 Alternative 6A: Linear ramping with a maximum P* of 0.40 when the $B/B_{MSY}$ ratio is less than or equal to 1.0 and a linear ramping with a maximum P* of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5

Under the alternative, linear increases in the P* would occur as the ratio of $B/B_{MSY}$ increases to a maximum of 0.40 at the inflection point of $B/B_{MSY}$ = 1.0. This is consistent with the current risk policy. Once stock biomass exceeds $B_{MSY}$ and the $B/B_{MSY}$ ratio is equal to or greater than 1.0, linear increases in the P* would then occur to a maximum P* of 0.49 at the inflection point of $B/B_{MSY}$ = 1.5. The maximum P* of 0.49 would then be applied when $B/B_{MSY}$ ratios are equal to or greater than 1.5 (Figure 6). This alternative seeks to prevent stocks from being overfished by reducing the probability of overfishing as stock size falls below $B_{MSY;}$ while also allowing for increased risk under high stock biomass conditions that are 1.5 times greater than $B_{MSY}$. Consistent with the current risk policy, this alternative would also implement a P* of 0 percent if the ratio of $B/B_{MSY}$ is less than or equal to 0.10 would remain to ensure the stock does not reach low levels from which it cannot recover.

A $B/B_{MSY}$ ratio of 1.5 indicates a very robust stock with favorable conditions that are substantially above the $B_{MSY}$ target, even with uncertainty in the terminal year biomass estimate. These very high biomass conditions have not been observed frequently throughout the Council's management history. Currently, only scup and black sea bass have a $B/B_{MSY}$ ratio greater than 1.5. Butterfish, surfclam and ocean quahog have $B/B_{MSY}$ ratios between 1.0 and 1.5 which, under this alternative, would result in a P* between 0.4 and 0.48.

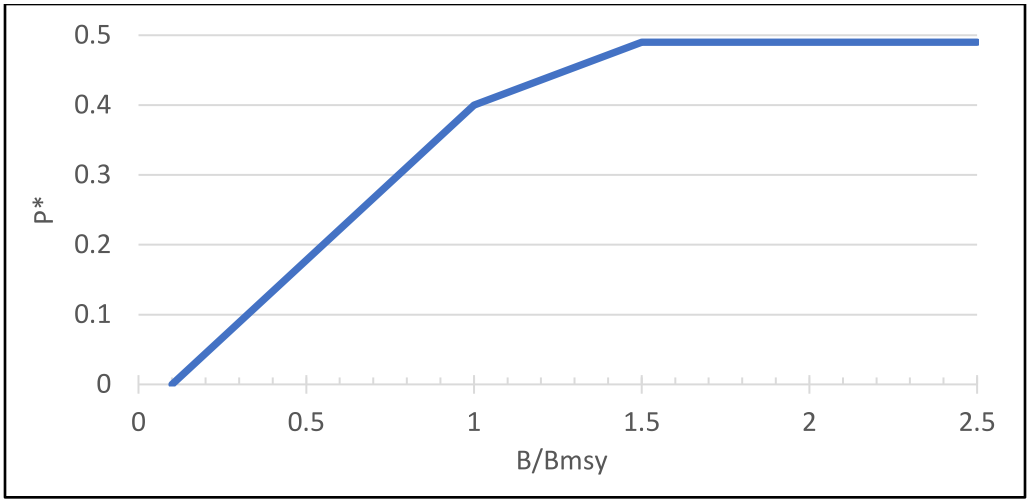


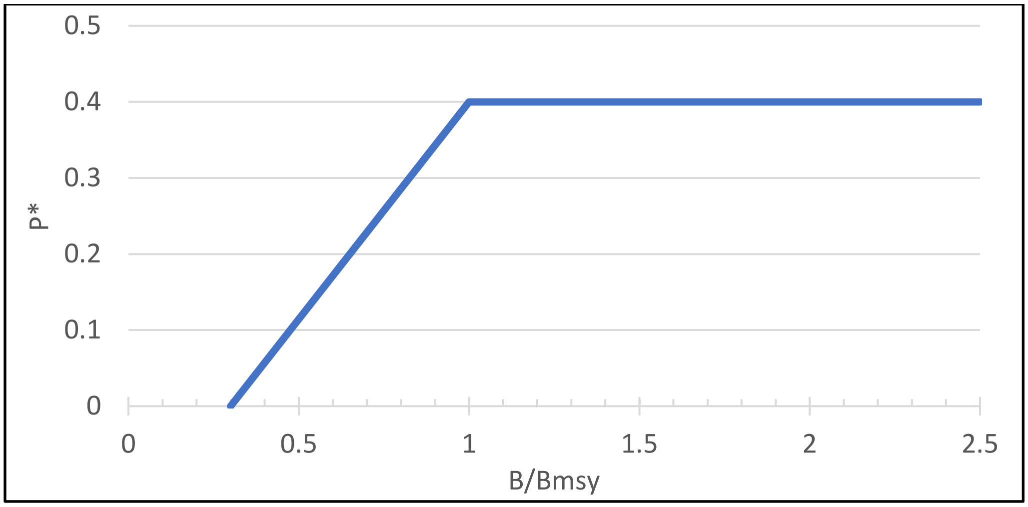

**Figure 6:** Alternative 6A with linear ramping to a maximum P* of 0.40 when the $B/B_{MSY}$ ratio is less than 1.0 and a linear ramping with a maximum P* of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5.

### 5.7 Alternative 7A: Current risk policy with a stock replenishment threshold equal to 0.3

Under this alternative, the current risk policy would remain with the P* for a given stock conditional on current stock biomass relative to $B_{MSY}$ and a maximum P* set at 0.4 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0; however, the P* will be set equal to 0 percent (i.e., no fishing) if the ratio of $B/B_{MSY}$ is less than or equal to the stock replenishment threshold of 0.3 instead of the current threshold of 0.1 (Figure 7A). This alternative is more risk adverse than the current risk policy and attempts to minimize the likelihood of getting to an overfished condition and increase the probability of stock recovery in shorter period of time (Figure 7B).

The current stock replenishment threshold was determined by expert opinion but was not quantitatively derived and may be too low to adequately provide for stock recovery. This alternative allowed for a comprehensive evaluation to quantify the implications and trade-offs associated with the cost of closing a fishery and minimizing the risk of reaching an overfished condition under different stock replenishment thresholds. However, it should be noted that once the $B/B_{MSY}$ ratio is less than 0.5, the stock is declared overfished and a rebuilding plan is implemented.

**A)**

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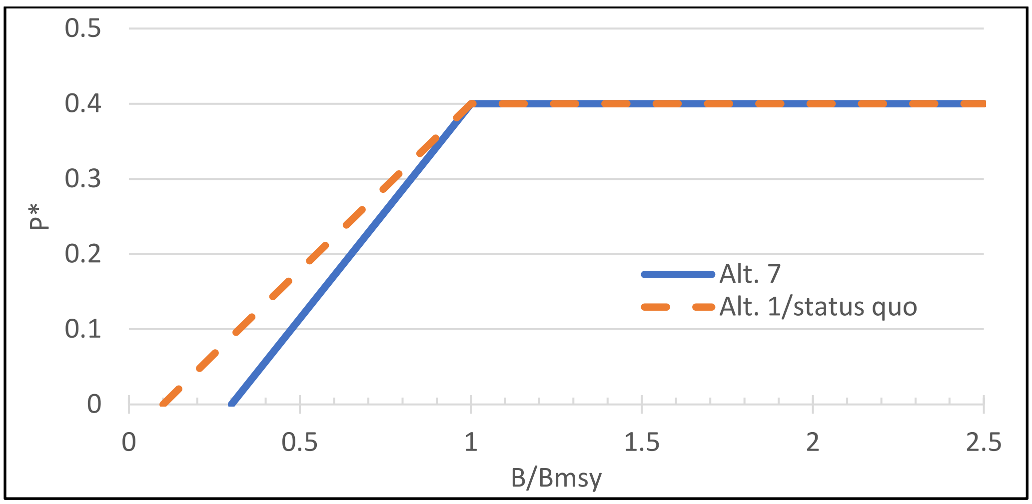
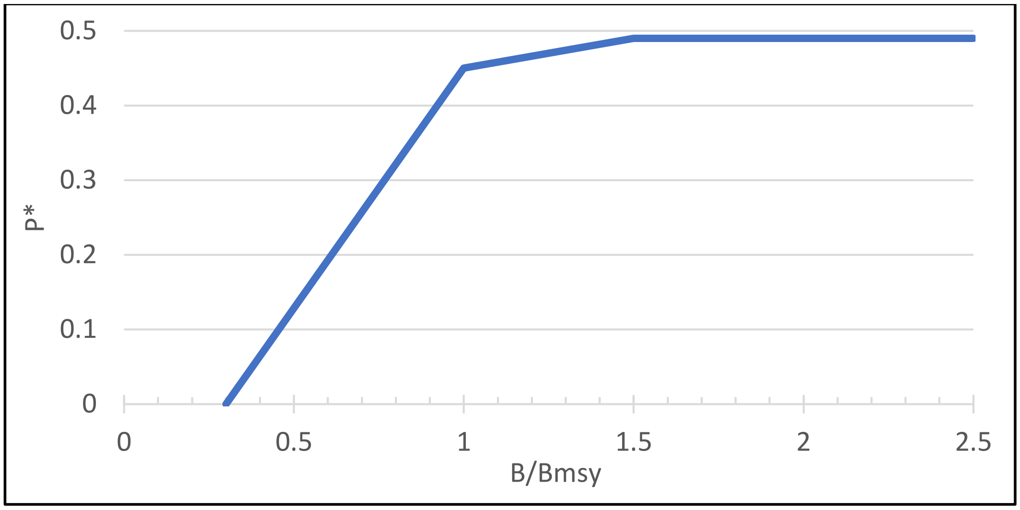



**Figure 7:** Alternative 7A with a variable probability of overfishing (P*) up to a maximum P* of 0.40 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0 and a P* of 0 if the ratio of $B/B_{MSY}$ is less than or equal to the stock replenishment threshold of 0.3. **B)** Comparison between Alternative 1A/*status quo* (typical species) and Alternative 7A.

### 5.8 Alternative 8A: Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5 and a P* equal to 0 when the $B/B_{MSY}$ ratio less than or equal to 0.3

This alternative was developed by the Council during framework meeting 1 deliberations and integrates certain elements of Alternatives 6A and 7A (Figure 8A). Similar to Alternative 6A, this alternative would have two different linear ramping functions with a maximum P* = 0.49 when the $B/B_{MSY}$ ratio is greater than or equal to 1.5. However, this alternative allows for linear increases in the P* as the ratio of $B/B_{MSY}$ increases to maximum P* of 0.45 at the inflection point of $B/B_{MSY}$ = 1.0, while Alternative 6 sets the maximum P* = 0.40 at this biomass ratio. In addition, similar to Alternative 7, this alternative would set the P* = 0 (i.e., no fishing) if the ratio of $B/B_{MSY}$ is less than or equal to the stock replenishment threshold of 0.3. This alternative provides for increasing risk under higher stock biomass, particularly when biomass is near or above the target, and would be more risk adverse as a stock biomass declines to minimize the risk of reaching an overfished condition (Figure 8B).

**A)**




**B)**

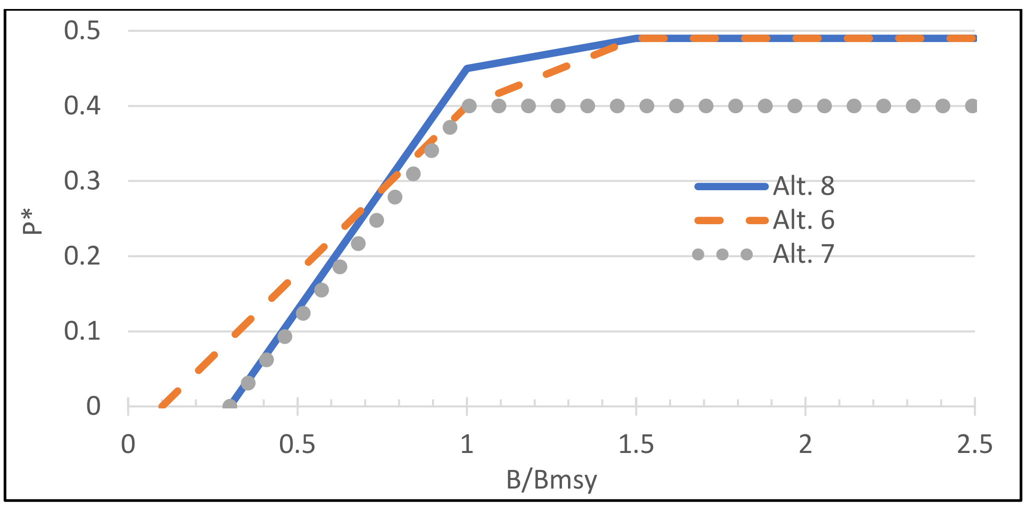


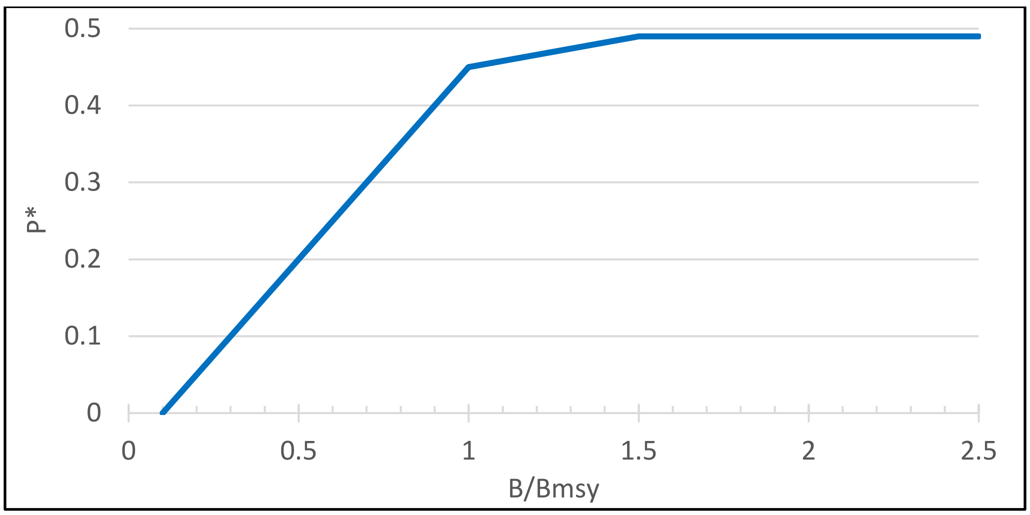

**Figure 8:** Alternative 8A with a linear ramping to a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5 and a P* = 0 when the $B/B_{MSY}$ ratio is less than or = 0.3. **B)** Comparison between Alternatives 6A, Alternative 7A, and Alternative 8A, a modified hybrid alternative that incorporates elements of both Alternatives 6A and 7A.

### 5.9 Alternative 9A (Preferred Alternative): Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of

**0.49 when the B/$B_{MSY}$ ratio is equal to or greater than 1.5 and a P* equal to 0 when the B/$B_{MSY}$ ratio less than or equal to 0.1**

This alternative was developed during framework meeting 2 deliberations. During the meeting the Council primarily debated the merits and implications of Alternative 2A and Alternative 8A. The Council was interested in allowing for increased risk under high stock biomass conditions such as those currently observed with black sea bass and scup. They were also supportive of reducing fishing effort and the probability of overfishing as stock size falls below the target but were concerned about the potential implications and consequences of modifying the slope of the linear ramping due to changes in the stock replenishment threshold. The Council initially approved Alternative 2A but later reconsidered the decision and ultimately approved an approach that combines aspects of both Alternative 2A and Alternative 8A (Figures 9A and 9B). The modified alternative utilizes the stock replenishment threshold and subsequent ramping associated with Alternative 2A and the higher P* values under high stock biomass conditions associated with Alternative 8A.

**A)**



**B)**

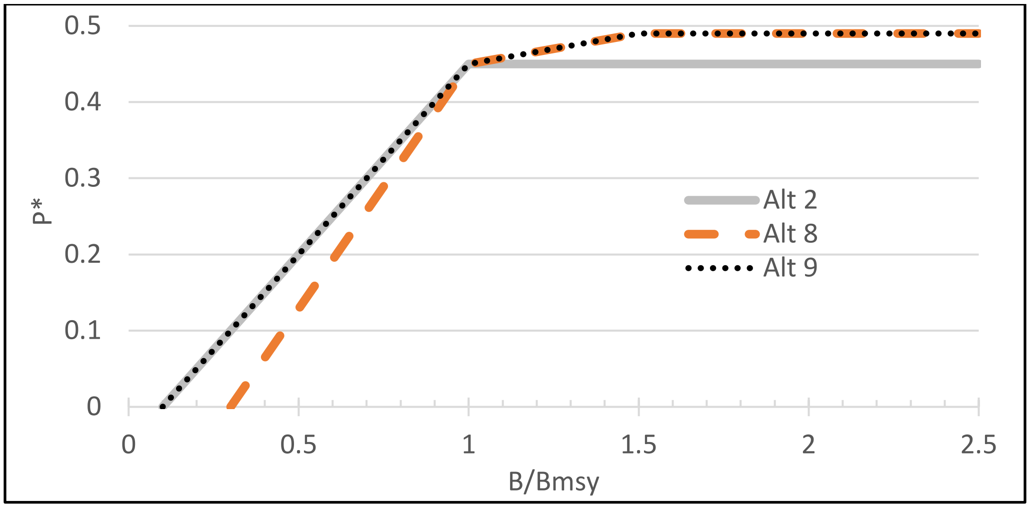



**Figure 9:** Alternative 9A with a linear ramping to a maximum P* of 0.45 when the B/$B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the B/$B_{MSY}$ ratio is equal to or greater than 1.5 and a P* = 0 when the B/$B_{MSY}$ ratio is less than or = 0.1. **B)** Comparison between Alternative 2A, Alternative 8A and Alternative 9A, a modified hybrid alternative that incorporates elements of both Alternatives 2A and 8A.

## 5.10 Alternative 1B: *Status quo*/No action, typical/atypical distinction

Similar to the approach taken with the current risk policy for "typical" species, the P* associated with an "atypical" species is conditional on current stock biomass relative to $B_{MSY}$ but has a maximum P* set at 0.35 instead of 0.4 (Figure 1). This measure was originally implemented by the Council reflecting the Council's lower risk tolerance for species whose life histories make them more vulnerable to over-exploitation. The SSC determines whether a stock is typical or atypical each time an ABC is recommended. Currently, ocean quahog is the only stock in which the SSC applied the atypical designation.

## 5.11 Alternative 2B (Preferred Alternative): Eliminate the typical/atypical distinction in the risk policy

Under this option, the SSC would not consider a typical/atypical designation and the risk policy and P* application would be the same, per the risk policy alternatives described above, for all species regardless of their life histories.

## 5.12 Overview of Analysis and Evaluation of Alternatives

During the Council's initial risk policy review in 2017, a management strategy evaluation (MSE) to consider the biological and fishery yield implications of different risk policy alternatives was conducted by Dr. John Wiedenmann from Rutgers University (Wiedenmann 2018). The MSE included an evaluation of five different alternatives[1], including the current risk policy, assuming two different OFL CV distributions (60% and 100%) with variable natural mortality, recruitment, and stock assessment data for summer flounder, scup, and butterfish.

This analysis indicated that while all risk policy alternatives did limit overfishing under baseline/average conditions (median probability of overfishing below the 50% threshold for each stock), the linear ramping P* alternatives (i.e. those like the current Council risk policy) were better at preventing overfishing and reduced the risk of a population declining to low levels, particularly under "poor" conditions (i.e., above average natural mortality and below average recruitment). The MSE results also highlighted potential trade-offs associated with the various alternatives ability to limit overfishing and the short and long-term yield from the fishery. Generally, for a given stock, short-term yield (first 5 projection years) under varying future conditions were generally consistent across all alternatives and the maximum P* value, 0.40 versus 0.45, played a larger role in short-term yield than any specific control rule shape (constant, stepped or ramped). At the time, staff concluded the Council's current risk policy may provide for additional stock protection as environmental conditions become increasingly variable and continue to change in the Mid-Atlantic as a result of climate change and should, therefore, not be modified.

After reviewing the results of this analysis, the Council expressed interest in not only considering biological factors but to also more comprehensively consider economic and social factors and the potential implications when evaluating risk policy alternatives. However, the existing MSE did not analyze or account for different economic factors within each fishery but, the outputs from the MSE could be used in economic models to help understand the short- and long-term economic impacts of the different risk policy alternatives. Therefore, the Council agreed to delay the framework action and allow time for the potential development of economic models that could evaluate the current risk policy and potential alternatives.

Building off an existing economic MSE for summer flounder (Hutniczak et al. 2018), Dr. Doug Lipton (NMFS Office of Science and Technology) and Cyrus Teng (doctoral candidate at the University of Maryland) developed a summer flounder economic model to integrate with the risk policy MSE in order to evaluate the economic effects of the five different risk policy alternatives (Teng and Lipton 2018). The economic model is separated into two sub-models that account for the recreational and commercial summer flounder fisheries and include factors such as price, demand, and fishing effort information. The results from the initial economic model indicated statistically significant differences in the total net economic benefits between the different risk policy alternatives that were evaluated with the current policy providing the most conservative approach and lowest net economic benefit. These differences were highly influenced by the starting condition of the summer flounder biomass with lower catch and, therefore, lower net economic benefit for some harvest control rules when stock biomass is below the $B_{MSY}$. As biomass stabilizes around $B_{MSY}$, there was a much smaller difference in the net economic benefits between all of the alternatives as they effectively become equivalent to each other at high biomass levels.

[1] During the Council's initial risk policy review in 2017, there were five different alternatives considered and evaluated through a management strategy evaluation. These same five alternatives (Alternatives 1-5) and four new alternatives (Alternatives 6-9) were evaluated and considered during this omnibus action.

Given all of this information, the Council decided to re-evaluate and reconsider both existing and potentially new risk policy alternatives that would assess the short- and long-term trade-offs between stock biomass protection and economic yield and benefits. In addition, the Council established a workgroup comprised of NOAA Fisheries staff, SSC members, academia and Council staff tasked with further developing and analyzing the current risk policy and any potential alternatives.

Dr. Wiedenmann updated his previous MSE model to evaluate the biological implications of all nine risk policy alternatives considered and developed during the framework process (Wiedenmann 2020). The updated MSE was again conducted for summer flounder, scup, and butterfish and included updated stock assessment information, the new Marine Recreational Information Program (MRIP) estimates, assessment timing based on the new Northeast Region Coordinating Council (NRCC) assessment schedule, an assumed 100% OFL CV distribution, and variable natural mortality, recruitment, and stock assessment bias to evaluate the robustness of the risk policy alternatives to changing stock conditions.

Consistent with previous analyses, the results of the updated MSE indicate that all of risk policy alternatives generally limited the risk of overfishing under "average" and "good" conditions (i.e., low natural mortality and above average recruitment); while the linear ramping P* alternatives (Alternatives 1A (*status quo*), 2A, 6A, 7A, 8A, and 9A (preferred)) were better at preventing overfishing and reduced the risk of a population declining to low levels particularly under "poor" conditions. In general, the constant and stepped alternatives (Alternatives 3A, 4A, and 5A) resulted in higher risk of overfishing and becoming overfished, particularly under poor conditions with some scenarios exceeding the 50% probability of overfishing threshold allowed by MSA (Table 4).

On the other hand, the biological model results indicate the constant and stepped alternatives generally provided greater fishery benefits when compared to the ramped alternatives. The constant and stepped alternatives produced higher average catch and lower catch variability (i.e. greater catch stability), particularly within the first five years of projections (Table 5). These fishery benefits were not as significant when evaluated over the long-term (i.e., final 20 years of a 30 year projection) because stocks tended to stabilize around $B_{MSY}$ where the P* is very similar across all alternatives.

However, these results are highly dependent upon the starting condition of the stock. For butterfish, where the starting biomass is about 41% higher than the $B_{MSY}$ target, the results show very distinct differences between the risk policy alternatives. The constant and stepped alternatives consistently resulted in higher short- and long-term catch across all productivity scenarios. Both short- and long-term butterfish catch with average productivity was approximately 19% greater for the constant and stepped alternatives relative to catch under the *status quo* alternative (Figure 10). All of the ramped alternatives, except for Alternative 7A, resulted in an approximate 9% increase in butterfish catch under average productivity when compared to the *status quo*; while Alternative 7A resulted in butterfish catch that was 4% lower when compared to the *status quo* (Figure 10). However, the constant and stepped alternates also resulted in higher risk and were consistently higher than the ramped alternatives (Table 4). The probability of overfishing associated with the constant and ramped alternatives were approximately three times higher than the *status quo* alternative across all productivity scenarios and these alternatives exceeded the 50% probability of overfishing under good productivity scenarios. The ramped alternatives, except for Alternative 7A, were about two times higher than the *status quo* under all productivity scenarios and no scenario exceeded the 50% probability of overfishing. In a few scenarios, particularly under poor productivity scenarios, the constant and ramped alternatives resulted in a high probability of the stock becoming overfished. Butterfish stock dynamics, such as highly variable recruitment, play a large role in these results but still highlight the ramped alternatives provide for greater stock protection and stability.

For scup, where current biomass is nearly twice the $B_{MSY}$ target, all of the alternatives performed equally well at limiting risk to the stock (i.e., no scenario where the probability of overfishing exceeded 50%) with only a 1% - 2% difference between the constant and stepped alternatives and the ramped alternatives. The maximum P* value (0.4, 0.45, or 0.49) played a larger role in short-term scup yield than any specific control rule shape (Figure 11). For example, Alternatives 6A, 8A, and the preferred alternative 9A all resulted in the highest short-term scup catch with an increase of approximately 16% compared to the *status quo* and all are associated with the highest P* of 0.49 when stock biomass is very high. Alternatives 2A, 4A, and 5A have a maximum P* of 0.45 and resulted in an increase in catch of 8% compared to the *status quo*. While Alternatives 3A and 7A performed similar to *status quo* since all have the same maximum P* of 0.40. For long-term scup catch, all of the alternatives, except for Alternatives 3A and 7A, performed similarly as scup biomass is projected to decline over time and remain around the $B_{MSY}$ target (Figure 11).

For summer flounder, where the starting biomass is 22% below $B_{MSY}$ target, the results are mixed. Under average and good stock productivity conditions, all alternatives performed well and minimized the risk of overfishing. In fact, the risk of overfishing was well below the 50% probability threshold with a maximum overfishing probability of 26% observed with Alternatives 8A and the preferred alternative 9A (Table 4). However, under poor stock productivity scenarios, all constant and stepped alternatives resulted in situations close to or exceeding the 50% probability of overfishing. Overall, the constant and stepped alternatives had a 31% higher, on average, probability of overfishing and 11% higher, on average, in the probability of becoming overfished than the ramped alternatives. Since summer flounder biomass is below the $B_{MSY}$ target, the ramped alternatives have a lower starting P* than the constant and stepped alternatives and therefore, consistently result in lower short-term catch under all stock productivity scenarios. When compared to the *status quo* alternative, short-term summer flounder catch increased by approximately 14% under the constant and stepped alternatives (Figure 12). The ramped alternatives, excluding Alternative 7, resulted in short-term summer flounder catch that was approximately 4% higher, on average, than the *status quo*. Short-term summer flounder catch under Alternative 7A was projected to decline by nearly 4% when compared to the *status quo*. Long-term catch, however, was projected to increase by approximately 4% across all alternatives, except for Alternatives 3A and 7A, when compared to the *status quo* as stock biomass increases and stabilizes over time around the $B_{MSY}$ target (Figure 12).

The biological MSE results also highlight the importance and potential biological and management implications of assessment bias. When a stock assessment underestimates terminal year biomass, on average, all of the risk policy alternatives perform well, although the probability of overfishing and becoming overfished were slightly higher for butterfish where other stock dynamics play a greater role in the outcomes (Table 6). However, when a stock assessment overestimates, on average, the terminal year biomass, the probability of overfishing and the probability of a stock becoming overfished regardless of the risk policy implemented increases. This was particularly true for scup where all alternatives, except for Alternatives 1A (*status quo*) and 7A, resulted in the median probability of overfishing exceeding 50 percent (Table 6). This situation (i.e., overestimating stock biomass) could undermine management actions to control catch and prevent overfishing and should be closely monitored and evaluated following each stock assessment.

Dr. Doug Lipton and Cyrus Teng where then able to utilize the summer flounder outputs from the updated biological MSE and integrate with their previously developed summer flounder economic MSE model to evaluate the economic effects of the different risk policy alternatives (Teng and Lipton 2019). It should be noted that this analysis was not updated to evaluate the summer flounder economic benefits of Alternative 9A (preferred alternative) which was developed by the Council during framework meeting 2. However, the summer flounder fishery yield associated with Alternative 9A from the updated biological MSE analysis can be used as a proxy to help compare the anticipated economic benefits associated across the alternatives.

The results of the economic MSE indicate differences in the total net summer flounder economic benefit among the constant and stepped alternatives and the ramped alternatives (Table 7, Figure 13). One consistent result was the *status quo* alternative and Alternative 7A, the two most conservative approaches, provided the lowest net economic benefit across all scenarios and productivity runs. In addition, similar to the results noted for the biological model, the economic differences between the alternatives were highly influenced by the starting summer flounder biomass condition. Summer flounder biomass is below the $B_{MSY}$ and the ramped alternatives apply a lower level of risk (i.e., lower P*) which then results in lower short-term catch and, therefore, lower short-term net economic benefit when compared to the constant and ramped alternatives. Across all productivity scenarios, the constant and stepped alternatives result, on average, in an 8% greater short-term economic benefit than the ramped alternatives. However, over time as biomass is projected to stabilize around $B_{MSY}$, there is a much smaller difference in the long-term net economic benefits between all of the alternatives as they effectively become equivalent to each other at higher biomass levels (Table 7). Across all productivity scenarios, the constant and ramped alternatives resulted in a 2% greater long-term economic benefit when compared to the ramped alternatives and only a 1% greater long-term benefit when Alternatives 1A (*status quo*) and 7A were removed (Figure 13).

The comprehensive economic MSE was only conducted for summer flounder, however a more general economic evaluation for scup and butterfish was conducted (Lipton and Teng 2020). Based on the quantitative assessment conducted for scup, the total economic welfare is likely to be much more similar across the alternatives given the overall similarity in short- and long-term catch across the alternatives and the lower market price and lower sensitivity to recreational trips for scup. Drawing specific economic welfare conclusions for butterfish is more difficult given its low commercial price flexibility.

The Council's preferred risk policy alternative (Alternative 9A) performed well across all three species and all stock productivity scenarios evaluated and best balanced biological and fishery trade-offs by minimizing overall risk while allowing for moderate increases in yield and economic welfare when compared to the *status quo* alternative. Alternative 9A did result in slightly higher risk (higher probability of overfishing and becoming overfished) when compared to the *status quo* and Alternative 7A, the most risk adverse alternatives, but was similar to the other ramped alternatives. However, even with this slight increase in risk, there was no scenario in which Alternative 9A resulted in a probability of overfishing that exceeded 50 percent and only under persistent poor stock productivity conditions did the probability of becoming overfished exceed 50 percent, which occurred for all alternatives considered (Table 4). Alternative 9A also resulted in greater benefits to the fishery (catch, economic benefit and stability) when evaluating across all species and all scenarios compared to the *status quo* alternative and, according to the economic model, would result in an annual increase in economic welfare of more than $7.2 million ($36 million over five years) to the summer flounder fisheries over the *status quo* alternative[2].

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[2] The economic model was not updated to evaluate Alternative 9A, however short-term summer flounder catch estimates from the biological MSE show similar results between Alternative 2A and 9A. Therefore, the summer flounder economic model results are also likely to be similar between the two alternatives – results from Alternative 2A are referenced in the sentence.

**Table 4:** Results of the biological MSE model (Wiedenmann 2020) comparing the median probability of overfishing ($F > F_{MSY}$) and median probability of becoming overfished ($B < 0.5*B_{MSY}$) across all nine risk policy alternatives under different productivity scenarios. Alternatives 1A (*status quo*), 2A, 6A, 7A, 8A, and 9A (preferred) are ramped and alternatives 3A, 4A, and 5A are constant/stepped, highlighted in blue. Scenarios where the median probability of overfishing is greater than 0.5, maximum allowed under MSA, are in highlighted red.

| **Performance Measure** | **Productivity Scenario** | **Species** | **Alt. 1A** (*status quo*) | **Alt. 2A** | **Alt. 3A** | **Alt. 4A** | **Alt. 5A** | **Alt. 6A** | **Alt. 7A** | **Alt. 8A** | **Alt. 9A** (Preferred Alt) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prob. of overfishing | Average | Butterfish | 0.06 | 0.13 | 0.16 | 0.19 | 0.19 | 0.13 | 0.06 | 0.15 | 0.16 |
| Prob. of overfishing | Good | Butterfish | 0.16 | 0.19 | **0.61** | **0.61** | **0.52** | 0.16 | 0.10 | 0.13 | 0.19 |
| Prob. of overfishing | Poor | Butterfish | 0.13 | 0.19 | 0.32 | 0.35 | 0.29 | 0.19 | 0.16 | 0.23 | 0.23 |
| Prob. of overfished | Average | Butterfish | 0.54 | 0.64 | 0.65 | 0.71 | 0.69 | 0.64 | 0.51 | 0.65 | 0.67 |
| Prob. of overfished | Good | Butterfish | 0.03 | 0.04 | 0.15 | 0.16 | 0.12 | 0.02 | 0.02 | 0.02 | 0.03 |
| Prob. of overfished | Poor | Butterfish | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Prob. of overfishing | Average | Scup | 0.10 | 0.26 | 0.10 | 0.23 | 0.23 | 0.29 | 0.10 | 0.32 | 0.32 |
| Prob. of overfishing | Good | Scup | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.06 | 0.06 |
| Prob. of overfishing | Poor | Scup | 0.32 | 0.39 | 0.39 | 0.45 | 0.42 | 0.39 | 0.32 | 0.39 | 0.39 |
| Prob. of overfished | Average | Scup | 0.21 | 0.26 | 0.21 | 0.26 | 0.26 | 0.27 | 0.21 | 0.27 | 0.28 |
| Prob. of overfished | Good | Scup | 0.05 | 0.08 | 0.05 | 0.09 | 0.09 | 0.10 | 0.05 | 0.11 | 0.11 |
| Prob. of overfished | Poor | Scup | 0.55 | 0.61 | 0.57 | 0.63 | 0.62 | 0.60 | 0.55 | 0.63 | 0.63 |
| Prob. of overfishing | Average | Summer flounder | 0.13 | 0.23 | 0.13 | 0.19 | 0.19 | 0.19 | 0.10 | 0.26 | 0.26 |
| Prob. of overfishing | Good | Summer flounder | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.06 | 0.06 |
| Prob. of overfishing | Poor | Summer flounder | 0.32 | 0.39 | **0.58** | **0.58** | 0.48 | 0.32 | 0.32 | 0.39 | 0.39 |
| Prob. of overfished | Average | Summer flounder | 0.14 | 0.23 | 0.15 | 0.24 | 0.23 | 0.24 | 0.14 | 0.27 | 0.28 |
| Prob. of overfished | Good | Summer flounder | 0.03 | 0.05 | 0.03 | 0.05 | 0.05 | 0.06 | 0.02 | 0.06 | 0.06 |
| Prob. of overfished | Poor | Summer flounder | 0.72 | 0.80 | 0.87 | 0.87 | 0.84 | 0.75 | 0.71 | 0.78 | 0.80 |

**Table 5:** Results of the biological MSE model (Wiedenmann 2020) comparing the average short and long-term catch, average annual change in catch, and maximum change in catch across 30 year projection for all nine risk policy alternatives under the average productivity scenario. Alternatives 1A (*status quo*), 2A, 6A, 7A, 8A, and 9A (preferred) are ramped and alternatives 3A, 4A, and 5A are constant/stepped and highlighted in blue.

| Performance Measure | Projection Timeframe | Species | Alt. 1A (*status quo*) | Alt. 2A | Alt. 3A | Alt. 4A | Alt. 5A | Alt. 6A | Alt. 7A | Alt. 8A | Alt. 9A (Preferred Alt) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. catch | Short - first 5 years | Butterfish | 25,228 | 27,982 | 29,051 | 30,803 | 29,820 | 27,305 | 24,333 | 27,486 | 28,593 |
| Avg. catch | Long - final 20 years | Butterfish | 27,833 | 30,297 | 32,380 | 33,814 | 32,855 | 29,532 | 26,634 | 29,727 | 30,720 |
| Avg. annual change in catch | NA | Butterfish | 0.16 | 0.16 | 0.12 | 0.12 | 0.13 | 0.17 | 0.18 | 0.19 | 0.17 |
| Max change in catch | NA | Butterfish | 0.38 | 0.41 | 0.27 | 0.27 | 0.29 | 0.44 | 0.45 | 0.52 | 0.43 |
| Avg. catch | Short - first 5 years | Scup | 11,253 | 12,245 | 11,253 | 12,245 | 12,245 | 13,114 | 11,253 | 13,114 | 13,114 |
| Avg. catch | Long - final 20 years | Scup | 12,206 | 12,790 | 12,291 | 12,952 | 12,892 | 12,876 | 12,192 | 13,150 | 13,169 |
| Avg. annual change in catch | NA | Scup | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.12 | 0.11 | 0.12 | 0.12 |
| Max change in catch | NA | Scup | 0.27 | 0.28 | 0.26 | 0.27 | 0.27 | 0.3 | 0.27 | 0.3 | 0.3 |
| Avg. catch | Short - first 5 years | Summer flounder | 8,710 | 9,273 | 9,936 | 9,936 | 9,820 | 8,710 | 8,391 | 8,925 | 9,273 |
| Avg. catch | Long - final 20 years | Summer flounder | 13,466 | 14,046 | 13,561 | 14,033 | 14,105 | 13,918 | 13,460 | 14,041 | 14,109 |
| Avg. annual change in catch | NA | Summer flounder | 0.14 | 0.15 | 0.12 | 0.13 | 0.14 | 0.16 | 0.15 | 0.17 | 0.16 |
| Max change in catch | NA | Summer flounder | 0.36 | 0.42 | 0.26 | 0.31 | 0.34 | 0.45 | 0.4 | 0.51 | 0.45 |

**Table 6:** Results of the biological MSE model (Wiedenmann 2020) comparing the median probability of overfishing ($F > F_{MSY}$) and median probability of becoming overfished ($B < 0.5*B_{MSY}$) across all nine risk policy alternatives assuming biomass, on average, from a stock assessment was over- or under-estimated. Alternatives 1A (*status quo*), 2A, 6A, 7A, 8A, and 9A (preferred) are ramped and alternatives 3A, 4A, and 5A are constant/stepped, highlighted in blue. Scenarios where the median probability of overfishing is greater than 0.5, maximum allowed under MSA, are in highlighted red.

| **Performance Measure** | **Assessment Performance** | **Species** | **Alt. 1A** (*status quo*) | **Alt. 2A** | **Alt. 3A** | **Alt. 4A** | **Alt. 5A** | **Alt. 6A** | **Alt. 7A** | **Alt. 8A** | **Alt. 9A** (Preferred Alt) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prob. of overfishing | Underestimate | Butterfish | 0.03 | 0.10 | 0.10 | 0.16 | 0.13 | 0.10 | 0.03 | 0.13 | 0.13 |
| Prob. of overfishing | Overestimate | Butterfish | 0.19 | 0.27 | 0.26 | 0.35 | 0.32 | 0.26 | 0.19 | 0.29 | 0.29 |
| Prob. of overfished | Underestimate | Butterfish | 0.47 | 0.57 | 0.59 | 0.66 | 0.63 | 0.55 | 0.43 | 0.57 | 0.59 |
| Prob. of overfished | Overestimate | Butterfish | 0.70 | 0.80 | 0.77 | 0.82 | 0.83 | 0.83 | 0.68 | 0.82 | 0.84 |
| Prob. of overfishing | Underestimate | Scup | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Prob. of overfishing | Overestimate | Scup | 0.47 | **0.55** | **0.52** | **0.58** | **0.58** | **0.55** | 0.45 | **0.58** | **0.58** |
| Prob. of overfished | Underestimate | Scup | 0.01 | 0.03 | 0.01 | 0.03 | 0.03 | 0.03 | 0.01 | 0.03 | 0.03 |
| Prob. of overfished | Overestimate | Scup | 0.44 | 0.51 | 0.45 | 0.51 | 0.51 | 0.53 | 0.44 | 0.54 | 0.54 |
| Prob. of overfishing | Underestimate | Summer Flounder | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.06 |
| Prob. of overfishing | Overestimate | Summer Flounder | 0.32 | 0.47 | 0.39 | **0.52** | 0.48 | 0.45 | 0.32 | 0.48 | **0.52** |
| Prob. of overfished | Underestimate | Summer Flounder | 0 | 0.01 | 0 | 0.02 | 0.01 | 0.02 | 0 | 0.04 | 0.03 |
| Prob. of overfished | Overestimate | Summer Flounder | 0.29 | 0.5 | 0.32 | 0.5 | 0.48 | 0.5 | 0.3 | 0.57 | 0.6 |

**Table 7:** Results of the summer flounder economic MSE model (Teng and Lipton 2019) comparing the short- and long-term cumulative economic benefit ($000's) across all nine risk policy alternatives under different productivity scenarios. Alternatives 1A (*status quo*), 2A, 6A, 7A, 8A, and 9A (preferred) are ramped and alternatives 3A, 4A, and 5A are constant/stepped, highlighted in blue. Note: Alternative 9 was developed by the Council during the framework meeting 2 and was not able to be analyzed through the economic MSE model.

| **Productivity Scenario** | **Projection Timeframe** | **Alt. 1** (*status quo*) | **Alt. 2A** | **Alt. 3A** | **Alt. 4A** | **Alt. 5A** | **Alt. 6A** | **Alt. 7A** | **Alt. 8A** | **Alt. 9A** (Preferred Alt) |
|---|---|---|---|---|---|---|---|---|---|---|
| Average | Short - cumulative first 5 years | 758 | 794 | 830 | 840 | 825 | 765 | 738 | 774 | NA |
| Good | Short - cumulative first 5 years | 892 | 937 | 966 | 983 | 968 | 908 | 872 | 922 | NA |
| Poor | Short - cumulative first 5 years | 638 | 665 | 706 | 711 | 696 | 641 | 619 | 644 | NA |
| Average | Long - cumulative 30 years | 4,312 | 4,390 | 4,380 | 4,427 | 4,414 | 4,352 | 4,295 | 4,379 | NA |
| Good | Long - cumulative 30 years | 7,434 | 7,670 | 7,476 | 7,693 | 7,685 | 7,723 | 7,423 | 7,768 | NA |
| Poor | Long - cumulative 30 years | 2,515 | 2,544 | 2,632 | 2,632 | 2,606 | 2,513 | 2,478 | 2,503 | NA |

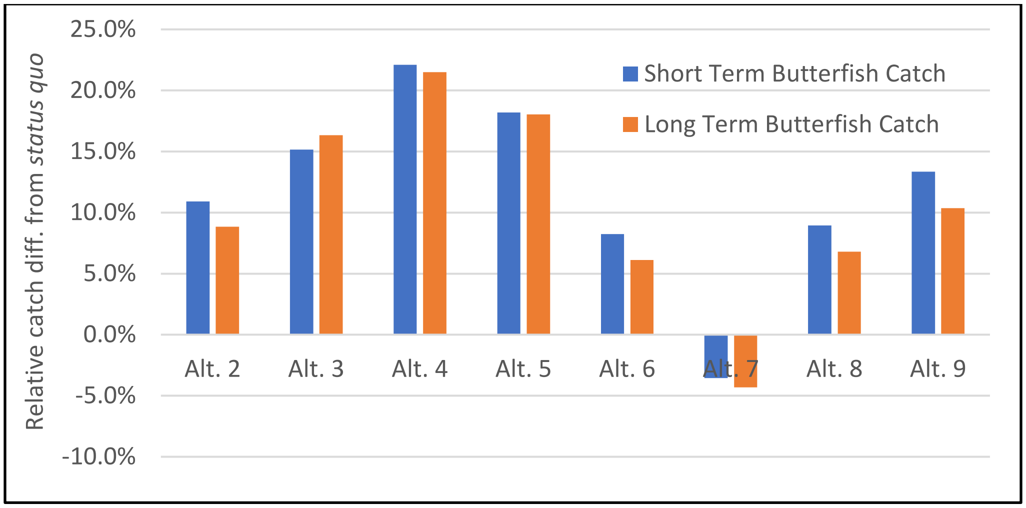


**Figure 10:** Relative difference (%) in average short-term and long-term butterfish catch for each risk policy alternative control rule relative to the *status quo* alternative. Short-term is the first 5 projection years after implementation of the risk policy alternative; long-term catch is the final 20 years, of a 30 year projection, after implementation of the risk policy alternative.

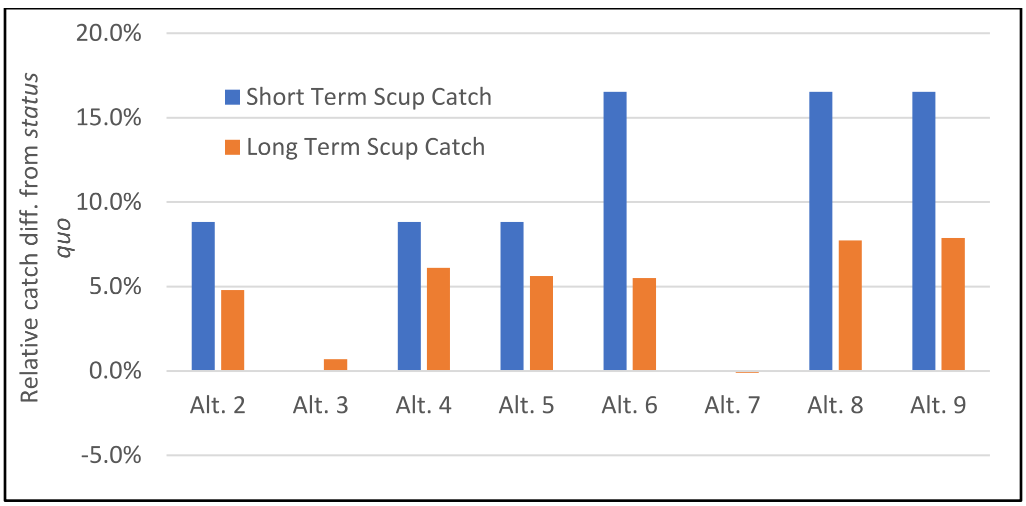


**Figure 11:** Relative difference (%) in average short-term and long-term scup catch for each risk policy alternative control rule relative to the *status quo* alternative. Short-term is the first 5 projection years after implementation of the risk policy alternative; long-term catch is the final 20 years, of a 30 year projection, after implementation of the risk policy alternative.

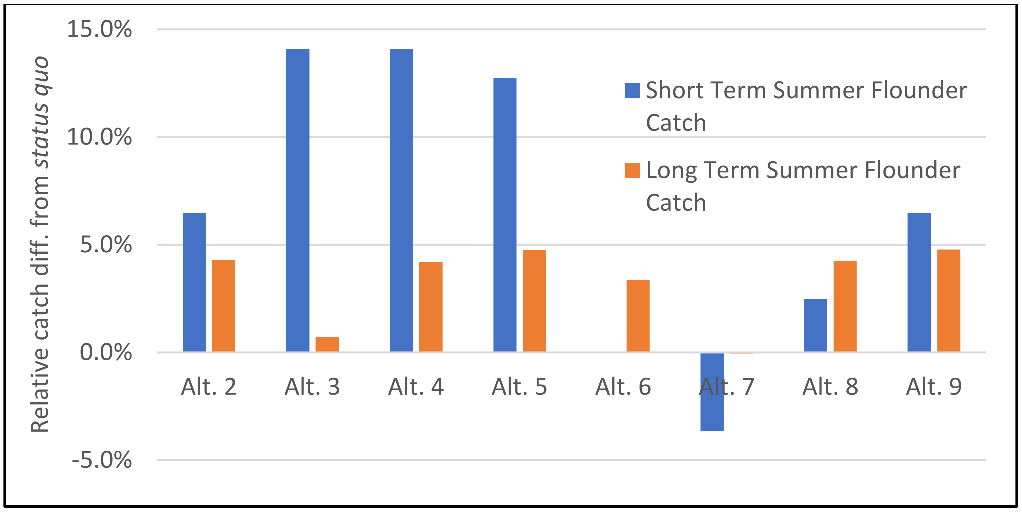


**Figure 12:** Relative difference (%) in average short-term and long-term summer flounder catch for each risk policy alternative control rule relative to the *status quo* alternative. Short-term is the first 5 projection years after implementation of the risk policy alternative; long-term catch is the final 20 years, of a 30 year projection, after implementation of the risk policy alternative.

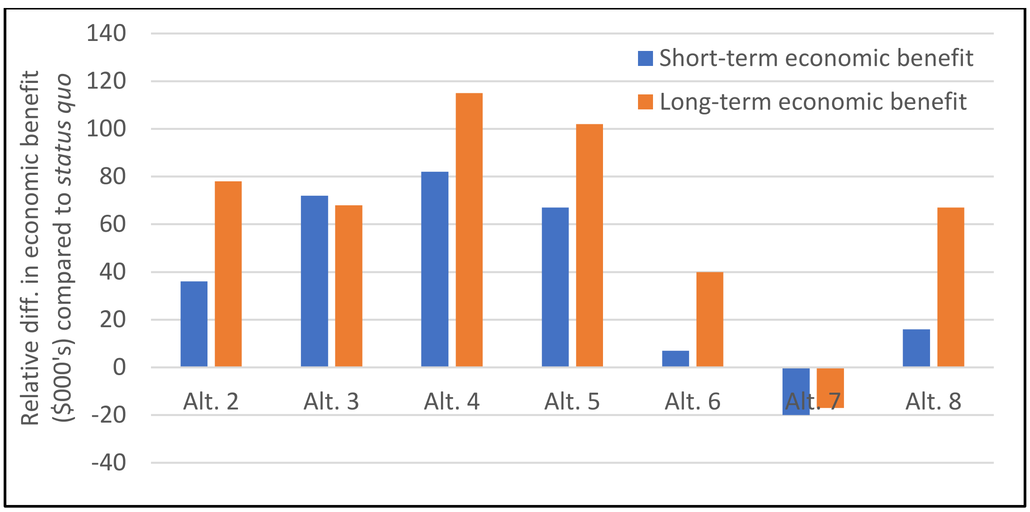


**Figure 13:** Relative difference (%) in the cumulative short-term and long-term summer flounder economic benefits ($000's) for each risk policy alternative control rule relative to the *status quo* alternative under average productivity scenarios. Short-term is the first 5 projection years after implementation of the risk policy alternative; long-term catch is the entire 30 year projection, after implementation of the risk policy alternative. Note: Alternative 9 is not included in the figure as it was not analyzed in the summer flounder economic MSE model.

## 6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The affected environment consists of those physical, biological, and human components of the environment expected to experience impacts if any of the actions considered in this document were to be implemented. This document focuses on five aspects of the affected environment, which are defined as valued ecosystem components (VECs; Beanlands and Duinker 1984).

The VECs include:

- Managed resources
- Non-target species
- Physical habitat
- Protected species
- Human communities

The following sections describe the recent condition of the VECs.

### 6.1 Managed Resources

The managed resources VEC includes Atlantic surfclam, ocean quahog, Atlantic mackerel, longfin squid, *Illex* squid, butterfish, chub mackerel, summer flounder, scup, black sea bass, Atlantic bluefish, spiny dogfish, golden tilefish, and blueline tilefish which is managed under the Surfclam and Ocean Quahog FMP, Atlantic Mackerel, Squid, and Butterfish FMP, Summer Flounder, Scup, and Black Sea Bass FMP, Bluefish FMP, Spiny Dogfish FMP, and Tilefish FMP, respectively.

#### 6.1.1 Atlantic Surfclam

The Atlantic surfclam is a bivalve mollusk that inhabits sandy continental shelf habitats of the North Atlantic Ocean from the southern Gulf of St. Lawrence to Cape Hatteras, North Carolina. The maximum age for surfclams exceeds 30 years, and ages of 15-20 years are common in many areas. Atlantic surfclams are suspension feeders on phytoplankton, and use siphons which are extended above the surface of the substrate to pump in water. Additional life history information is detailed in the Essential Fish Habitat (EFH) document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. The status of Atlantic surfclam is not overfished with no overfishing occurring. The latest stock assessment was peer reviewed in 2016 (SAW 61) and is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents. There is a management track assessment update scheduled for 2020.

#### 6.1.2 Ocean Quahog

The ocean quahog, is a bivalve mollusk found in temperate and boreal waters on both sides of the North Atlantic Ocean. Ocean quahogs are one of the longest-living, slowest growing marine bivalves in the world and typically live to more than 100 years old, with some aged in excess of 200 years. Ocean quahogs burrow in a variety of substrates and are often associated with fine sand at depths between 20 – 100 meters. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. The status of ocean quahog is not overfished with no overfishing occurring. The latest stock assessment was peer reviewed in 2017 (SAW 63) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents. There is a management track assessment update scheduled for 2020.

### 6.1.3 Atlantic Mackerel

The Atlantic mackerel is a semi-pelagic/semi-demersal (may be found near the bottom or higher in the water column) schooling fish species found on both sides of the North Atlantic Ocean and in the western Atlantic are primarily distributed between Labrador (Newfoundland, Canada) and North Carolina. Atlantic mackerel grow and mature quickly and can live up to 20 years old. They primarily feed on crustaceans such as copepods, krill, and shrimp and also eat squid. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. The status of Atlantic mackerel is currently overfished and overfishing is occurring. The latest benchmark stock assessment was peer reviewed in 2018 (SAW 64) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents. There is a management track assessment update scheduled for 2021.

### 6.1.4 Butterfish

The Atlantic butterfish is a semi-pelagic/semi-demersal schooling fish species primarily distributed between Florida to Newfoundland, but are primarily found from Cape Hatteras to the Gulf of Maine. Butterfish are a small, short-lived and fast growing fish with few living beyond age three. Butterfish typically feed on small squid and crustaceans. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of butterfish is not overfished with no overfishing occurring. The latest benchmark stock assessment was peer reviewed in 2014 (SAW 58) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and an assessment update was completed in 2017 and is available at: Butterfish 2017 Stock Assessment Update. There is a management track assessment update scheduled for 2020.

### 6.1.5 Longfin Squid

The longfin squid is a semi-pelagic/semi-demersal schooling cephalopod species found from Newfoundland to the Gulf of Venezuela and in the northwest Atlantic are primarily distributed between Georges Bank and Cape Hatteras, NC. Longfin squid grow very rapidly and, on average, reach a size of about 1 foot in length. They also have a very short life-span with most living between 6 to 8 months. Larger longfin squid primarily feed on crustaceans and small fish. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment the status of longfin squid is not overfished but there is not enough information to determine level of fishing mortality and if subject to overfishing. The last benchmark stock assessment was peer reviewed in 2011 (SAW 51) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and an assessment update was completed in 2017 and is available at: Longfin Squid Assessment Update. There is a management track assessment update scheduled for 2020.

### 6.1.6 *Illex* Squid

The *Illex* squid is a semi-pelagic/semi-demersal schooling cephalopod species distributed between Newfoundland and the Florida Straits. Illex squid live less than a year, have highly variable growth and maturity rates and their population dynamics are highly influenced by environmental conditions. They eat crustaceans, fish and other squid, including their own species. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. The status of *Illex* is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. The last benchmark stock assessment was peer reviewed in 2005 (SAW 42) and determined the data available for *Illex* squid was insufficient to determine fishing mortality, stock biomass or determine stock status. Recent *Illex* research and analysis conducted in advance of the research track assessment, scheduled for the fall of 2021, indicates the stock is likely lightly exploited ((Rago 2020a; Rago 2020b) and that fishing activity occurred in 2-10% of the available shelf habitat occupied by *Illex* squid (Wright et al. 2020 ms).

### 6.1.7 Chub Mackerel

Chub mackerel is a schooling pelagic species that can be found on the continental shelf to depths of about 250-300 meters off the Mid-Atlantic, New England, South Atlantic, Gulf of Mexico, and Caribbean waters either year-round or seasonally. Chub mackerel grow rapidly and can live to at least age 13 (Carvalho et al. 2002). Chub mackerel are opportunistic predators with a seasonally variable diet of small crustaceans (especially copepods), small fish, and squid (Collette and Nauen 1983, Castro and Del Pino 1995, Sever et al. 2006). Additional life history and habitat information, including EFH, can be found in the EA and proposed rule (proposed rule). The stock status of chub mackerel in the western Atlantic Ocean is unknown as there have been no quantitative assessments of this species in this region.

### 6.1.8 Summer Flounder

The summer flounder is a demersal flatfish species found in the inshore and offshore waters of the Atlantic coast from Nova Scotia, Canada to the east coast of Florida with a center of abundance within the Middle Atlantic Bight from Cape Cod, Massachusetts, to Cape Hatteras, North Carolina. Summer flounder grow and mature quickly and can live to 12-15 years, with females typically larger and older than males. Summer flounder are opportunistic, ambush predators that eat a variety of prey, mostly fish and crustaceans. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of summer flounder is not overfished with no overfishing occurring. The latest stock assessment was peer reviewed in 2018 (SAW 66) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents. The next management track assessment update is scheduled for June 2021.

### 6.1.9 Scup

The scup is a schooling, demersal temperate species that occurs primarily from Massachusetts to South Carolina (reported as far north as the Bay of Fundy and Sable Island Bank, Canada and as far south as Florida). Scup grow slowly and can live up to age 20 but mature quickly and can reproduce by age 2. Scup primarily feed on invertebrates and graze on the sea floor. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of scup is not overfished with no overfishing occurring. The latest benchmark stock assessment was peer reviewed in 2015 (SAW 60) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and the most recent operational assessment was completed and peer reviewed in 2019 and is available at: 2019 Operational Assessment and Peer Review Panel Report: Bluefish, Black Sea Bass, Scup. The next management track assessment update is scheduled for 2021.

### 6.1.10 Black Sea Bass

The black sea bass is a warm-temperate species that is usually associated with structured habitats, such as reefs and shipwrecks, on the continental shelf. It occurs from southern Nova Scotia and the Bay of Fundy to southern Florida and into the Gulf of Mexico. Black sea bass are protogynous hermaphrodites, meaning they are born female and some later transition to males, usually around 2-5 years of age as they grow and mature. Black sea bass grow slowly and begin to reproduce between 1-3 years old with females living 8 years and males about 12. Black sea bass feed on the bottom and on the structured habitat in which they live with their diet consisting of clams, crabs, shrimp, worms, and small fish. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of black sea bass is not overfished with no overfishing occurring. The latest benchmark stock assessment was peer reviewed in 2016 (SAW 62) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and the most recent operational assessment was completed and peer reviewed in 2019 and is available at: 2019 Operational Assessment and Peer Review Panel Report: Bluefish, Black Sea Bass, Scup. The next management track assessment update is scheduled for 2021.

### 6.1.11 Atlantic Bluefish

The bluefish is a wide-ranging schooling pelagic species found in the western North Atlantic from Nova Scotia and Bermuda to Argentina (but rare between southern Florida and northern South America). Bluefish are fast growers, begin to reproduce at age 2, and can live up to 12 years. Bluefish are predatory fish with razor-sharp teeth that eat a variety of squid and fish, particularly Atlantic menhaden, anchovy, and silversides. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of bluefish is overfished with no overfishing occurring. The latest benchmark stock assessment was peer reviewed in 2015 (SAW 60) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and the most recent operational assessment was completed and peer reviewed in 2019 and is available at: 2019 Operational Assessment and Peer Review Panel Report: Bluefish, Black Sea Bass, Scup. The next management track assessment update is scheduled for 2021.

### 6.1.12 Spiny Dogfish

The spiny dogfish, is a migratory coastal shark with a circumboreal distribution. The northwest Atlantic Ocean population is not believed to mix with populations from Europe, Asia, the northeast Pacific, or the southern hemisphere, although these other populations are not considered to consist of separate species. Spiny dogfish grow slow, mature late, and can live up to 40 years. Spiny dogfish are top-level predators and feed on a wide variety of small fish, crustaceans, jellyfish, squid, and other marine animals. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of spiny dogfish is not overfished with no overfishing occurring. The latest benchmark stock assessment was peer reviewed in 2006 (SAW 43) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and an assessment update was completed in 2018 and is available at: 2018 Spiny Dogfish Stock Assessment Update. The next management track assessment update is scheduled for 2022.

### 6.1.13 Golden Tilefish

The golden tilefish is most abundant from Georges Bank to Key West, Florida and throughout much of the Gulf of Mexico. Their habitat is a relatively restricted band, approximately 80-540 m deep and 8-17º C, known as the "warm belt" on the outer continental shelf and upper slope of the northwest Atlantic coast. Their distribution, which appears discontinuous, may be controlled by temperature, depth, and the availability of shelter or fine, semi-consolidated sediments that support their shelter burrows. Tilefish grow slowly, begin to reproduce between ages 2-4, and can live up to 46 years. Tilefish feed on the bottom eating a variety of organisms such as shrimp, crabs, clams, snails, worms, anemones, and sea cucumbers. Additional life history information is detailed in the EFH document for the species, located at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. According to the most recent assessment, the status of golden tilefish is not overfished with no overfishing occurring. The latest benchmark stock assessment was peer reviewed in 2014 (SAW 58) is available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents and an assessment update was completed in 2017 and is available at: Golden Tilefish Stock Assessment Update Through 2016 – NEFSC. The next management track assessment update is scheduled for 2021.

### 6.1.14 Blueline Tilefish

Blueline tilefish are primarily distributed from Campeche, Mexico northward through the Mid-Atlantic. Several recently completed studies suggest that blueline tilefish from the eastern Gulf of Mexico through the Mid-Atlantic are comprised of one genetic stock (http://sedarweb.org/sedar-50-data-workshop). Blueline tilefish inhabit the shelf edge and upper slope reefs at depths of 46-256m and temperatures between 15-23°C. Blueline tilefish are long-lived fish reaching sizes up to about 36 inches and exhibit dimorphic growth with males attaining larger size-at-age than females. They are considered opportunistic predators that feed on prey associated with substrate (crabs, shrimp, fish, echinoderms, polychaetes, etc.). According to the most recent assessment, the status of blueline tilefish is not overfished with no overfishing occurring south of Cape Hatteras, with unknown stock status north of Cape Hatteras. The 2017 stock assessment split the stock due to data and modeling issues. The latest stock assessment is available at http://sedarweb.org/sedar-50. The next scheduled assessment update is scheduled for 2021.

## 6.2 Non-Target Species

The following sections describe non-target and/or bycatch species in Council-managed fisheries. Non-target species are those species caught incidentally while targeting other species. Non-target species may be retained or discarded. The term "bycatch," as defined by the MSA, means fish that are harvested in a fishery but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic and regulatory discards, and F due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include fish released alive under a recreational catch-and-release fishery management program. Bycatch must be minimized to the extent practicable per the MSA, and the Council's FMPs have evaluated bycatch and taken steps where appropriate to reduce bycatch to the extent practicable to ensure compliance with the MSA.

### 6.2.1 Atlantic Surfclam and Ocean Quahog

The surfclam and ocean quahog fisheries, prosecuted with hydraulic dredges, are extremely clean, as evidenced by the 1997 NMFS Northeast Fisheries Science Center (NEFSC) clam survey species listing (Table 34 of Amendment 13, http://www.mafmc.org/fishery-management-plans). Surfclams and ocean quahogs comprise well over 80 percent of the total catch from the survey, with no fish caught. Only sea scallops, representing other commercially desirable invertebrates were caught at around one-half of one percent. Commercial operations are cleaner than the scientific surveys which have liners in the dredges, as all animate and inanimate objects except surfclams and ocean quahogs are discarded quickly before the resource is placed in the cages. The processors reduce their payments if "things" other than surfclams or ocean quahogs are in the cages (Wallace and Hoff 2004).

### 6.2.2 Atlantic Mackerel

Mackerel and Atlantic (sea) herring are often caught together in midwater trawls and can make analysis of bycatch in the commercial mackerel fishery difficult. However, analysis has identified spiny dogfish, Atlantic (sea) herring, scup, blueback herring, striped bass, hickory shad, silver hake (whiting), American shad, alewife, unclassified dogfish, and butterfish as primary bycatch and/or discard species for the mackerel fishery. There are significant recreational landings of mackerel in Massachusetts, New Hampshire, and Maine in the summer. Analysis of how much of that catch is directed and how much is incidental has not been undertaken, but the directed portion likely catches other gamefish in those areas such as striped bass and bluefish at least on occasion. More detailed information on non-target catch in this fishery can be found in Framework 13 to the Mackerel, Squid, and Butterfish FMP that established a 5-year rebuilding program for mackerel and set the latest mackerel specifications, available at: Framework 13 (Atlantic Mackerel Rebuilding Framework with Specifications).

### 6.2.3 Butterfish

The commercial butterfish fishery has primarily occurred when butterfish itself is caught as bycatch and retained. Red hake, silver hake, spiny dogfish, scup, unclassified skates, fourspot flounder, longfin squid, Atlantic mackerel, and little skate are have been identified as bycatch and/or discard species for the butterfish fishery. Recreational landings of butterfish are negligible.

### 6.2.4 Longfin Squid

This is a commercial trawl fishery that takes place offshore year-round depending on availability and inshore during the summer months. The longfin squid fishery has relatively high bycatch levels, but recent management actions (Amendment 10 to the MSB FMP) implemented measures to reduce bycatch to the extent practicable as required under the MSA, including implementing a discard cap on butterfish. The most common species caught and primarily discarded include butterfish, dogfishes, hakes, skates, scup, flounders, lady crabs, and sea robins. More detailed information on non-target catch in this fishery can be found in the 2018-2020 specifications environmental assessment, available at: https://www.regulations.gov/document?D=NOAA-NMFS-2017-0089-0002.

### 6.2.5 *Illex* Squid

This is a commercial trawl fishery that occurs offshore in the summer months with relatively low bycatch, but non-target species that are caught include longfin squid, butterfish, buckler dories, chub mackerel, and spotted hake. More detailed information on non-target catch in this fishery can be found in the 2018-2020 specifications environmental assessment, available at: https://www.regulations.gov/document?D=NOAA-NMFS-2017-0089-0002.

### 6.2.6 Chub Mackerel

Initially, the chub mackerel was primarily a bycatch fishery in the *Illex* squid trawl fishery. Overtime a commercial chub mackerel fishery has become more established, though it remains an alternative to the *Illex* squid fishery. Given the unique needs to successfully prosecute this fishery (i.e., vessels need to be large, fast, and have refrigerated sea water or freezing capabilities), there is a small number of vessels that participate in the fishery and over 95% of the chub mackerel landings over the last 20 years came from fewer than five vessels. An analysis of Northeast Fisheries Observer Program (NEFOP) data conducted in the chub mackerel EA and proposed rule found the most commonly caught species on directed chub mackerel were *Illex* squid, longfin squid, butterfish, and round herring. Additional information on non-target analysis can be found in the proposed rule at: proposed rule.

### 6.2.7 Summer Flounder, Scup, and Black Sea Bass

The summer flounder, scup and black sea bass commercial fisheries are mixed fisheries, prosecuted with bottom and midwater trawls, fish pots/traps, and lines, where squid, Atlantic mackerel, silver hake, skates, and other species are harvested with summer flounder, scup, and/or black sea bass. Recent specification environmental assessments provide a full description of bycatch in these fisheries (summer flounder EA: https://www.fisheries.noaa.gov/action/revised-2019-summer-flounder-specifications; scup and black sea bass EA: https://www.fisheries.noaa.gov/action/revised-2020-and-projected-2021-black-sea-bass-and-scup-specifications). There are significant recreational fisheries for summer flounder, scup, and black sea bass. The recreational fishery may catch and/or land numerous other species within the management units of these resources. These species could include, but are not limited to, striped bass, bluefish, weakfish, tautog, Atlantic croaker, spot, spiny dogfish, skates species, and other flounder species and pelagics.

### 6.2.8 Bluefish

The bluefish commercial fishery is a mixed species fishery prosecuted with gillnets, otter trawls, and handlines, where bonito, Atlantic croaker, weakfish, and spiny dogfish are harvested with bluefish. Section 3.1.3.9 of Amendment 1 to the Bluefish FMP (http://www.mafmc.org/fishery-management-plans) provides a full description of bycatch in these fisheries. There is a significant recreational fishery for bluefish. The recreational fishery may catch and/or land numerous other species which could include, but are not limited to striped bass, weakfish, and other pelagics.

### 6.2.9 Spiny Dogfish

The spiny dogfish commercial fishery is prosecuted with hook and line gear, gillnets, and to a lesser degree trawl gear, where by far, the primary discard species in the spiny dogfish fishery is spiny dogfish, followed by other species including cod, skates, herring, and scup. Section 3.1.3.9 of the Spiny Dogfish FMP (http://www.mafmc.org/fishery-management-plans) provides a full description of bycatch in these fisheries. There is not significant directed recreational fishery for spiny dogfish, but it is a common discard while fishing for other recreationally sought species.

### 6.2.10 Golden and Blueline Tilefish

Golden tilefish are primarily caught by longline and bottom otter trawl with the overwhelming majority (97%) of the golden tilefish landings taken by longline gear. Catch composition analysis utilizing vessel trip report (VTR) data conducted as part of the 2014 benchmark stock assessment (https://www.fisheries.noaa.gov/new-england-mid-atlantic/northeast-stock-assessment-documents) indicates none to very little (0.03%) discarding was reported by longline vessels that targeted golden tilefish and that golden tilefish discards in the trawl and longline fishery appear to be a minor component of the catch. Tilefish are occasionally taken incidental to other directed trawl fisheries.

In the Council's management area, a limited commercial blueline tilefish fishery has been prosecuted with bottom longline gear but the fishery is currently limited to incidental landings. Section 6.4 of Amendment 6 to the FMP provides a discussion of bycatch in the blueline tilefish fishery (http://www.mafmc.org/fishery-managementplan), but data show minimal non-target interactions and/or discarding in the targeted golden tilefish fishery and the same would be expected for blueline tilefish. Tilefish are occasionally taken incidental to other directed trawl fisheries.

## 6.3 Physical Environment and Essential Fish Habitat

The physical, chemical, biological, and geological components of benthic and pelagic environments are important aspects of habitat for marine species and have implications for reproduction, growth, and survival of marine species. The following sections briefly describe key affected physical and biological environments inhabited by the managed resources. This information is drawn from Stevenson et al. (2004), unless otherwise noted.

### 6.3.1 Physical Environment

The managed resources primarily inhabit the Northeast U.S. Shelf Ecosystem, including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 2000 m. Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope.

The Gulf of Maine is a semi-enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types.

Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents.

The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina.

The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom.

The continental shelf in this region was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet and the subsequent rise in sea level. Currents and waves have since modified this basic structure.

Shelf and slope waters of the Mid-Atlantic Bight have a slow southwestward flow that is occasionally interrupted by warm core rings or meanders from the Gulf Stream. On average, shelf water moves parallel to bathymetry isobars at speeds of 5 - 10 cm/s at the surface and 2 cm/s or less at the bottom. Storm events can cause much more energetic variations in flow. Tidal currents on the inner shelf have a higher flow rate of 20 cm/s that increases to 100 cm/s near inlets.

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 - 200 m water depth) at the shelf break. Numerous canyons incise the slope and some cut up onto the shelf itself. The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales. Most of these structures are relic except for some sand ridges and smaller sand-formed features. Shelf valleys and slope canyons were formed by rivers of glacier outwash that deposited sediments on the outer shelf edge as they entered the ocean. Most valleys cut about 10 m into the shelf; however, the Hudson Shelf Valley is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island. Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

Some sand ridges are more modern in origin than the shelf's glaciated morphology. Their formation is not well understood; however, they appear to develop from the sediments that erode from the shore face. They maintain their shape, so it is assumed that they are in equilibrium with modern current and storm regimes. They are usually grouped, with heights of about 10 m, lengths of 10 - 50 km and spacing of 2 km. Ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. The seaward face usually has the steepest slope. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Swales occur between sand ridges. Since ridges are higher than the adjacent swales, they are exposed to more energy from water currents and experience more sediment mobility than swales. Ridges tend to contain less fine sand, silt and clay while relatively sheltered swales contain more of the finer particles. Swales have greater benthic macrofaunal density, species richness and biomass, due in part to the increased abundance of detrital food and the less physically rigorous conditions.

Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3 - 5 m with heights of 0.5 - 1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50 - 100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1 - 150 cm and heights of a few centimeters.

Sediments are uniformly distributed over the shelf in this region. A sheet of sand and gravel varying in thickness from 0 - 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf, but is common in the Hudson Shelf Valley. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the “mud line,” and sediments are 70 - 100% fine on the slope. On the slope, silty sand, silt, and clay predominate (Stevenson et al. 2004).

Greene et al. (2010) identified and described Ecological Marine Units (EMUs) in New England and the Mid-Atlantic based on sediment type, seabed form (a combination of slope and relative depth)[3], and benthic organisms.[4] According to this classification scheme, the sediment composition off New England and the Mid-Atlantic is about 68% sand, 26% gravel, and 6% silt/mud. The seafloor is classified as about 52% flat, 26% depression, 19% slope, and 3% steep.

Artificial reefs are another significant Mid-Atlantic habitat. These localized areas of hard structure were formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of these materials were deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure.

[3] Seabed form contains the categories of depression, mid flat, high flat, low slope, side slope, high slope, and steep slope.

[4] See Greene et al. 2010 for a description of the methodology used to define EMUs.

Like all the world's oceans, the western North Atlantic is experiencing changes to the physical environment due to global climate change. These changes include warming temperatures; sea level rise; ocean acidification; changes in stream flow, ocean circulation, and sediment deposition; and increased frequency, intensity, and duration of extreme climate events. These changes in physical habitat can impact the metabolic rate and other biological processes of marine species. As such, these changes have implications for the distribution and productivity of many marine species. Several studies demonstrate that the distribution and productivity of several species in the Mid-Atlantic have changed over time, likely because of changes in physical habitat conditions such as temperature (e.g., Weinberg 2005, Lucey and Nye 2010, Nye et al. 2011, Pinsky et al. 2013, Gaichas et al. 2015).

### 6.3.2 Essential Fish Habitat (EFH)

The MSA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (MSA section 3). The MSA requires that Councils describe and identify EFH for managed species and "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" (MSA section 303 (a)(7)).

The broad definition of EFH has led the Mid-Atlantic and the New England Fishery Management Councils to identify EFH throughout most of the Northeast U.S. Shelf Ecosystem, ranging from areas out to the shelf break to wetlands, streams, and rivers. Table 8 summarizes EFH within the affected area of this action for federally-managed species and life stages that are vulnerable to bottom tending fishing gear. EFH maps and text descriptions for these species and life stages can be found at www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper.

**Table 8:** Geographic distributions and habitat characteristics of EFH designations for benthic fish and shellfish species within the affected environment of the action.

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| 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; | 30-160 | Structurally complex sub-tidal hard bottom habitats with gravel, cobble, and boulder substrates with and without emergent epifauna and |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| | | Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay | | 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 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 |
| Clearnose skate | Juveniles | Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and | 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 |
|---|---|---|---|---|
| | | certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays | | |
| 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 |
| 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 |
| 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 |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| 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 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 |
| 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 | No information, generally overwinter offshore | Benthic habitats |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| | | southwestern Gulf of Maine and Cape Hatteras, North Carolina | | |
| 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 |
| 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 |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| 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 |
| 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 |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| 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 |

### 6.3.3 Fishery Impact Considerations

A variety of gears are used to harvest Council-managed species, including bottom tending gears such as bottom longline, anchored gillnet, hydraulic dredges, and bottom otter trawl which may impact the habitat of the managed species and other species. A variety of measures have been considered and implemented over the years in Council managed fisheries to minimize the impact of fishing on habitat, which are further described in the Environmental Assessment for the 2011 ACL/AM Omnibus. The measures generally include closed areas for trawling in particularly sensitive areas such as tilefish habitat. The table below describes the actions that last considered effects on species with overlapping EFH for Council-managed fisheries. Other notable actions that protect habitat from the effects of fishing gear include gear/area closures implemented by the New England Fishery Management Council (NEFMC) (see http://www.nefmc.org/management-plans/habitat for ongoing revisions to NEFMC habitat closures) and the Council's recently approved Deep Sea Coral Amendment (see http://www.mafmc.org/actions/msb/am16).

There have been no significant changes to the manner in which the Council fisheries are prosecuted since overlapping species impacts were last considered for the Council managed species (Table 9) and none of the alternatives being considered in this document would adversely affect EFH (see Section 6.3.2); therefore, the effects of fishing on EFH are not reevaluated in this document and no additional alternatives to minimize adverse effects on EFH are presented in this document.

**Table 9:** FMP Actions considering overlapping species EFH impacts.

| FMP | Action |
|---|---|
| Atlantic Surfclam and Ocean Quahog | Amendment 13 |
| Mackerel, Squid, Butterfish | Amendment 9 |
| Summer Flounder, Scup, Black Sea Bass | Amendment 13 |
| Bluefish | Amendment 1 |
| Spiny Dogfish | Original FMP |
| Golden and Blueline Tilefish | Amendment 1 |
| All documents available at: http://www.mafmc.org/fishery-management-plans | |

## 6.4 ESA and MMPA Protected Species

There are numerous species of fish, marine mammals, and sea turtles which occur in the affected environment within the management units of the Council's FMPs that are afforded protection under the Endangered Species Act (ESA) of 1973 (i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act (MMPA) of 1972 (see Table 10). For additional information on the species provided in Table 10 (e.g., life history, distribution, stock status), please visit: https://www.fisheries.noaa.gov/topic/endangered-species-conservation; https://www.fisheries.noaa.gov/topic/marine-mammal-protection; and https://www.fisheries.noaa.gov/species/cusk.

To aid in identifying ESA listed species that occur in the affected environment considered by the action (Table 10), ESA section 7 consultations completed on all six FMPs considered in this Framework were reviewed. Specifically, on January 2, 2020 , NMFS completed an ESA section 7 informal consultations on the surfclam and ocean quahog fisheries. This consultation concluded that the surfclam and ocean quahog fishery is extremely unlikely to interact with any ESA-listed species or their critical habitat and therefore, determined that the fishery is not likely to adversely affect any ESA-listed species or designated critical habitat under NMFS's jurisdiction. Similar conclusions were recently made for the tilefish fishery in an informal consultation issued by NMFS on October 27, 2017. In regards to the Mackerel, Squid, Butterfish, Summer Flounder, Bluefish, Scup, Black Sea Bass, and Spiny Dogfish fisheries, the 2013 Biological Opinion issued by NMFS on the operation of these and three other commercial fisheries (7 FMPs in total), and their impact on ESA listed species, was referenced (NMFS 2013).

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 continued operation of the seven FMPs may adversely affect, but would not jeopardize, the continued existence of North Atlantic right, fin and sei whales; loggerhead (Northwest Atlantic Ocean DPS), leatherback, Kemp's ridley, and green sea turtles[5]; the five listed DPSs of Atlantic sturgeon; or the Gulf of Maine DPS of Atlantic salmon. The Opinion also concluded that the continued operation of the seven FMPs would not destroy or adversely modify designated critical habitat for right whales or Atlantic salmon.[6] . 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 indicates that North Atlantic right whale abundance has been in decline since 2010 (Pace et al. 2017). This new

[5] Eleven DPSs of green sea turtles were designated on April 6, 2016; the North Atlantic DPS occurs in the Greater Atlantic Region (81 FR 20057). Pursuant to a memo issued by NMFS on May 16, 2016, it was determined that the newly listed DPSs of green sea turtles did not warrant reinitiation of the 2013 Batched Fisheries Opinion.

[6] Critical habitat for the Northwest Atlantic Ocean DPS of loggerhead sea turtles was designated on July 10, 2014 (79 FR 39755). Pursuant to a memo issued by NMFS on September 17, 2014, it was determined that the designation of critical habitat for the Northwest Atlantic Ocean DPS of loggerhead sea turtles did not trigger the need to reinitiate ESA section 7 consultation on 12 Greater Atlantic Region Fisheries, including the Northeast multispecies fishery.

information is different from that considered and analyzed in the 2013 Opinion and therefore, may reveal effects from this fishery that were not previously considered. As a result, per an October 17, 2017, ESA 7(a)(2)/7(d) memo issued by NMFS, the 2013 Opinion, as well as several other fishery Opinions, has been reinitiated. However, the October 17, 2017, ESA 7(a)(2)/7(d) memo issued by NMFS, determined "for the consultations being reinitiated …allowing these fisheries to continue during the reinitiation period will not increase the likelihood of interactions with these species above the amount that would otherwise occur if consultation had not been reinitiated, because allowing these fisheries to continue does not entail making any changes to any fishery during the reinitiation period that would cause an increase in interactions with whales, sea turtles, sturgeon, or Atlantic salmon. Because of this, the continuation of these fisheries during the reinitiation period would not be likely to jeopardize the continued existence of any whale, sea turtle, Atlantic salmon, or sturgeon species." Until replaced, the Mackerel, Squid, Butterfish, Summer Flounder, Scup, Black Sea Bass, Bluefish, and Spiny Dogfish fisheries are currently covered by the incidental take statement authorized in NMFS 2013 Biological Opinion as specified in the October 17, 2017, memo.

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**Table 10:** Protected species that may occur in the Affected Environment of the Councils FMPs. Marine mammal species italicized and in bold are considered MMPA strategic stocks.[1]

| Species | Status |
|---|---|
| **Cetaceans** | |
| ***North Atlantic right whale (Eubalaena glacialis)*** | ***Endangered*** |
| Humpback whale, West Indies DPS (Megaptera novaeangliae) | Protected (MMPA) |
| ***Fin whale (Balaenoptera physalus)*** | ***Endangered*** |
| ***Sei whale (Balaenoptera borealis)*** | ***Endangered*** |
| ***Blue whale (Balaenoptera musculus)*** | ***Endangered*** |
| ***Sperm whale (Physeter macrocephalus*** | ***Endangered*** |
| Minke whale (*Balaenoptera acutorostrata*) | Protected (MMPA) |
| Pilot whale (Globicephala spp.)[2] | Protected (MMPA) |
| Pygmy sperm whale (*Kogia breviceps*) | Protected (MMPA) |
| Dwarf sperm whale (*Kogia sima*) | Protected (MMPA) |
| Risso's dolphin (*Grampus griseus*) | Protected (MMPA) |
| Atlantic white-sided dolphin (*Lagenorhynchus acutus*) | Protected (MMPA) |
| Short Beaked Common dolphin (*Delphinus delphis*) | Protected (MMPA) |
| Atlantic Spotted dolphin (*Stenella frontalis*) | Protected (MMPA) |
| Striped dolphin (*Stenella coeruleoalba*) | Protected (MMPA) |
| ***Bottlenose dolphin (Tursiops truncatus)***[3] | ***Protected (MMPA)*** |
| Harbor porpoise (*Phocoena phocoena*) | Protected (MMPA) |
| **Sea Turtles** | |
| Leatherback sea turtle (*Dermochelys coriacea*) | Endangered |
| Kemp's ridley sea turtle (*Lepidochelys kempii*) | Endangered |
| Green sea turtle, North Atlantic DPS (*Chelonia mydas*) | Threatened |
| Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS | Threatened |
| Hawksbill sea turtle (*Eretmochelys imbricate*) | Endangered |
| **Fish** | |
| Shortnose sturgeon (*Acipenser brevirostrum*) | Endangered |
| Atlantic salmon (*Salmo salar*) | Endangered |
| Atlantic sturgeon *(Acipenser oxyrinchus)* | |
| *Gulf of Maine DPS* | Threatened |
| *New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS* | Endangered |
| Cusk (*Brosme brosme)* | Candidate |
| **Pinnipeds** | |
| Harbor seal (*Phoca vitulina*) | Protected (MMPA) |
| Gray seal (*Halichoerus grypus*) | Protected (MMPA) |
| Harp seal (*Phoca groenlandicus*) | Protected (MMPA) |
| Hooded seal (*Cystophora cristata*) | Protected (MMPA) |
| **Critical Habitat** | |
| North Atlantic Right Whale | ESA (Protected) |
| Northwest Atlantic DPS of Loggerhead Sea Turtle | ESA (Protected) |

[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).
[2] There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.
[3] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins. See https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region for further details.

Various gear types used to harvest Council-managed species may interact with protected resources. Specifically, interactions between protected resources and the following gear types have been observed or documented: hook and line, sink gillnet, bottom otter trawl, mid-water trawl, and/or pots/trap. Because the measures proposed in the Omnibus Framework are procedural (i.e., administrative in nature) and therefore, in and of themselves, will not cause the operation of the Council's FMPs (e.g., effort, behavior, area fished, gear quantity) to change, details on gear interaction risks to protected resources are not provided in this document; however, information on interaction risks associated with gear types used in each FMP may be found in the most recent environmental assessment document for each plan (available on the Council's website, www.mafmc.org), per Table 11.

**Table 11:** Recent specification Environmental Assessment for Council FMPs

| FMP | Action |
|---|---|
| Atlantic Surfclam and Ocean Quahog | 2014-2016 Specifications |
| Mackerel, Squid, Butterfish | 2019-2021 Specifications for Atlantic mackerel; 2018-2020 Specifications for squids and butterfish |
| Summer Flounder, Scup, Black Sea Bass | 2019-2021 Specifications for summer flounder; 2020-2021 Specifications for scup and black sea bass |
| Bluefish | 2020-2021 Specifications |
| Spiny Dogfish | 2019-2021 Specifications |
| Golden and Blueline Tilefish | 2018-2020 Specifications for golden tilefish; Amendment 6 for blueline tilefish |

## 6.5 Human Communities

Detailed descriptions of the economic aspects of the commercial and recreational fisheries for the managed resources are available in the most recent specifications' environmental assessments for each FMP (see Table 11). Additional human community information is available on each fishery in the form of annual fishery performance reports created by the Council's Advisory Panels, and well as background information documents (i.e., Fishery Information Documents) that the Advisory Panels use in developing their reports. These reports are available on the Council's website under each FMP. Profiles of the fishing ports and communities in the Northeast Region are also available at: https://nefsc.noaa.gov/read/socialsci/communitySnapshots.php.

Summary information is also provided below.

### 6.5.1 Commercial Fisheries

The 2018 ex-vessel value and commercial landings for each of the Council-managed fisheries are given in Table 12. The total 2018 combined ex-vessel value for all the managed resources is approximately $180.5 million. Ex-vessel sales also drive a variety of additional economic activities (support services, processed products, restaurants, etc.).

**Table 12:** Commercial ex-vessel value ($ millions) and commercial landings, in 2018.

| Species | **2018 Ex-Vessel Landings** (mil. lbs, except bushels for surfclam and ocean quahog – 1 bushel is approx. 17 lbs) | **Total 2018 Ex-Vessel Value** (millions $) | **Ex-Vessel Price** (per pound or bushel) |
|---|---|---|---|
| Atlantic Surfclam | 2.092 million bushels | $30 | $14.81 |
| Ocean Quahog | 3.196 million bushels | $24 | $7.53 |
| Atlantic Mackerel | 19.2 | $4.3 | $0.22 |
| Longfin Squid | 25.6 | $39 | $1.52 |
| Illex Squid | 53.1 | $23.6 | $0.44 |
| Butterfish | 3.7 | $2.7 | $0.73 |
| Summer Flounder | 6.1 | $25.3 | $4.11 |
| Scup | 13.4 | $9.7 | $0.73 |
| Black Sea Bass | 3.4 | $11.9 | $3.49 |
| Bluefish | 2.2 | $2.08 | $0.94 |
| Spiny Dogfish | 17.2 | $3.1 | $0.18 |
| Golden Tilefish | 1.5 | $4.8 | $3.30 |
| Blueline Tilefish | 0.01 | $0.03 | $2.25 |

Source: NE Dealer-Weighout Data for all but surfclam/ocean quahog, which come from clam vessel logbook data.

### 6.5.2 Recreational Fisheries

Recreational fisheries are a significant component to overall catch, fishing mortality, and fishing effort for many Mid-Atlantic stocks. Summer flounder, scup, black sea bass, bluefish, and mackerel continue to be important components of the Atlantic recreational fishery, with 2018 recreational harvest in Table 13.

**Table 13:** Recreational harvest of Council-managed species (millions of pounds).

| Species | **Harvest** (mil. lbs) |
|---|---|
| Summer Flounder | 7.60 |
| Black Sea Bass | 7.92 |
| Scup | 12.98 |
| Bluefish | 13.27 |
| Atlantic Mackerel | 4.55 |

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics and Economics Division, May 2020 (MRIP Query). Landings are coast-wide except for black sea bass, which are ME-NC, north of Cape Hatteras.

In 2018, total recreational angler trips in New England and the Mid-Atlantic (including North Carolina) were about 26 million. Trips by mode are included in Table 14. Northeast effort is included since many Council-managed species are caught in the Northeast, though trips in either the Northeast or Mid-Atlantic may not catch or even target Council-managed species.

**Table 14:** The total number of angler trips taken from Maine through North Carolina by fishing mode in 2018.

| Mode | Number of Trips |
|---|---|
| Private/Rental Boat | 1,194,871 |
| Party/Charter Boat | 24,914,901 |
| Shore/Man-Made | 43,626,505 |
| Total | 69,736,277 |

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics and Economics Division, May 2020 (MRIP Query).

These trips support a range of economic activity, from bait purchases to lodging. Angler expenditures in the broader Northeast Region by mode for marine fishing were last estimated with 2011 data (Lovell et. al. 2013). Expenditure data were produced from extensive surveys of marine recreational fishermen in the Northeast conducted as part of the marine recreational fishing program. Trip-related expenditure categories included private and public transportation, grocery store purchases, restaurants, lodging, boat fuel, boat and equipment rentals, party/charter fees, party/charter fees and tips, catch processing, access and parking, bait, ice, tournament fees and gifts/souvenirs, for a total of $200.63 per party/charter trip, $48.62 for private/rental boat trips, and $38.96 for shore fishing trips. In addition to trip-related expenditures, anglers make purchase on goods used on multiple trips - semi-durable items (e.g., rods, reels, lines, clothing, etc.) and durable goods (e.g., motor boats, vehicles, etc.). In 2014, the last year of complete information, anglers in the U.S. spent, on average, $2,823 on fishing related durable goods in a year (Lovell et. al. 2016, including details on each form ME to NC).

### 6.5.3 Analysis of Permit Data

*Federally Permitted Vessels*

According to NMFS permit data, at some point in 2018, there were 4,593 vessels with at least one active Northeast federal fishing permit, either commercial or party/charter (some vessels have both commercial and party/charter permits and most vessels have more than one permit). Of these vessels, 2,986 had at least one commercial or party/charter permit for a fishery managed by the Council. Not all permitted vessels actively participate in Council-managed fisheries – in 2018 approximately 1,073 federally permitted vessels landed at least one pound of at least one Council-managed fish commercially, and 428 federally-permitted vessels reported at least one for-hire trip where a Council managed species was caught. Accounting for vessels that reported both commercially and party/charter, in 2018 approximately 1,455 total vessels with federal permits were active in either or both the commercial and party/charter fisheries managed by the Council. Additional details on permitting for each fishery can be found in the environmental assessments created for annual specifications (see Table 11).

*Federally Permitted Dealers*

There were 258 dealers who purchased at least one of the managed resources in 2018. They were distributed by state as indicated in Table 15 below. Employment and revenue data for these specific firms are not available.

**Table 15:** Dealers reporting buying one or more of the Council-managed resources, by state in 2018.

| State | Number of Dealers |
|---|---|
| ME | 9 |
| NH | 3 |
| MA | 65 |
| RI | 28 |
| CT | 8 |
| NY | 56 |
| NJ | 33 |
| DE-MD | 6 |
| VA | 13 |
| NC | 32 |
| Other | 5 |
| Total | 258 |

Source: Dealer weighout data

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## 7.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The nature and extent of the management programs for the managed resources fisheries have been examined in detail in the EAs and Environmental Impact Statements (EISs) prepared for previously implemented management actions and are noted in sections 4.0 and 6.0. The aspects of the environment (VECs) that could be affected by the proposed actions are detailed in section 6.0, and the analysis in this section focuses on impacts relative to those (managed resources and non-target species, habitat (including EFH), protected resources, and human communities). The alternatives are compared to the current conditions of the VECs and to each other. The alternatives are not compared to a theoretical condition where the Council managed fisheries are not operating. These fisheries have occurred for many decades and are expected to continue into the foreseeable future.

The current conditions of the VECs are described in more detail in section 6. Impacts are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high) based on the guidelines shown in Table 16. It is not possible to quantify with confidence how these factors will change under each alternative; therefore, expected changes are estimated and/or described qualitatively.

The recent conditions of the VECs include the recent biological conditions of the managed resources, non-target species, and protected species, generally over the last five years (sections 6.1, 6.2, and 6.4). They also consider recent fishing practices and levels of fishing effort and landings in commercial and recreational fisheries of the managed resources, as well as the economic characteristics of the fisheries over the most recent three to five years (section 6.5). They also include recent levels of habitat availability and quality (section 6.3).

This Omnibus Framework is focused on establishing a process to specify the Council's level of risk under certain stock levels; therefore, it is difficult to determine whether the catch levels established under the different risk policy alternatives would/would not be similar to the *status quo* since the level of risk is dependent upon future stock biomass and its relation to $B_{MSY}$. In addition, the risk policy applies to stocks where quantitative estimates of biomass and biomass reference points (i.e., $B_{MSY}$) have been established and would not apply to stocks lacking these quantitative estimates such as *Illex* squid and blueline tilefish. Therefore, it will be difficult to predict the direct effect that the administrative process proposed would have on the managed resources, non-target species, habitat (including EFH), protected resources, and human communities. The actual catch levels that would be established through the process described in this Omnibus Framework cannot be predicted; however, the impacts of future catch levels will be evaluated through specifications.

The modification of the Council's risk policy does not result in direct impacts merely through its existence within the FMP. It is through the application of this administrative process in the future with respect to catch limits, that impacts will be realized; therefore, indirect impacts are anticipated and described in the sections that follow.

The alternatives considered here do not modify the existing commercial quotas or recreational harvest limits (RHL) set through the standard specification setting process (although current specifications may be modified in the future to utilize the new risk policy); therefore, fishing effort is expected to be similar to that analyzed in the specification documents for these Council managed fisheries and are expected to be similar across all alternatives. The proposed alternatives likely do not have any immediate impacts, but rather affect the management framework for future actions. Evaluating the indirect impacts of the alternatives considers the potential for increased or decreased commercial and recreational catches and opportunities relative to no action being taken. For example, many alternatives would allow for increased risk when stock biomass is at or greater than $B_{MSY}$ and would tend to increase commercial and recreational catch opportunities compared to no action being taken.

The result of the administrative process described in this Omnibus Framework (i.e., resulting future catch limits implemented), will be analyzed through specifications for each of the managed resources and subject to NEPA impact analysis as appropriate.

To prevent excessive repetition of text throughout sections 7.1-7.2, a discussion of how changes in catch limits may affect habitat and ESA proposed, threatened, or endangered species and MMPA protected species is provided here and would apply to the impact analysis that follows.

In general, alternatives which may result in overfishing or an overfished status for target and non-target species may have negative biological impacts for those species, compared to the current condition of the VEC. Conversely, alternatives which may result in a decrease in fishing effort, resulting in ending overfishing or rebuilding to the biomass target, may result in positive impacts for those species by resulting in a decrease in fishing mortality (Table 16).

For the physical environment and habitat (including EFH), alternatives that improve the quality or quantity of habitat are expected to have positive impacts. Alternatives that degrade the quality or quantity, or increase disturbance of habitat are expected to have negative impacts (Table 16). Most habitat areas where the managed resources are fished have been heavily fished by multiple fishing fleets over many decades and are unlikely to see a measurable improvement in their condition in response to any possible shifts in effort in a single fishery. The alternatives considered here administrative in nature and do not modify the existing recreational and commercial catch limits and will likely have little effect on fleet dynamics or fishing effort. Therefore, these alternatives will likely have no impact on the current habitat conditions but would allow for continued commercial operations which would limit any improvements to habitat condition.

For protected species, consideration is given to both ESA-listed species and MMPA-protected species. ESA-listed species include populations of fish, marine mammals, or turtles at risk of extinction (endangered) or endangerment (threatened). For endangered or threatened species, any action that results in interactions with or take of ESA-listed resources is expected to have negative impacts, including actions that reduce interactions. Actions expected to result in positive impacts on ESA-listed species include only those that contain specific measures to ensure no interactions with protected species (i.e., no take). By definition, all species listed under the ESA are in poor condition and any take has the potential to negatively impact that species' recovery. Under the MMPA, the stock condition of each protected species varies, but all are in need of protection. For marine mammal stocks/species that have their potential biological removal (PBR) level reached or exceeded, negative impacts would be expected from any alternative that has the potential to interact with these species or stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), actions 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 (Table 16). Thus, the overall impacts on the protected resources VEC for each alternative take into account impacts on ESA-listed species, impacts on non-ESA listed marine mammal stocks in good condition (i.e., PBR level has not been exceeded), and non-ESA listed marine mammal stocks that have exceeded or are in danger of exceeding their PBR level. Similar to the conclusion on habitat, the alternatives considered here are administrative and procedural in nature and will likely have little effect on fleet dynamics or fishing effort; therefore, these alternatives will likely have no impact on current protected resource conditions but would allow for continued recreational and commercial operations which will continue to interact with protected species and result in takes of those species.

Socioeconomic impacts are considered primarily in relation to potential changes in landings and prices, and by extension, revenues, compared to the current fishery conditions. Alternatives which could lead to increased availability of target species and/or an increase in catch per unit effort (CPUE) could lead to increased landings for particular communities or for the fishery as a whole. Alternatives which could result in an increase in landings are generally considered to have positive socioeconomic impacts because they could result in increased revenues (for fishing businesses as well as shoreside businesses); however, if an increase in landings leads to a decrease in price or a decrease in SSB for any of the landed species, then negative socioeconomic impacts could occur (Table 16).

A detailed description of the biological and economic management strategy evaluation results[7] and a comparison of the results between the alternatives is provided in section 5.12 and, to avoid duplication, will not be repeated here. The evaluation and comparison of the alternatives, including the comparison between the *status quo* and preferred alternatives, from section 5.12 will be used in the sections below with a focus on the managed species and socioeconomic VECs.

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[7] For additional details on the biological and economic management strategy evaluation methods and results please see Wiedenmann 2020 and Teng and Lipton 2019, respectively.

**Table 16:** Guidelines for defining the direction and magnitude of the impacts of alternatives on the VECs.

| General Definitions | | | | |
|---|---|---|---|---|
| VEC | Resource Condition | Direction of Impact | | |
| | | Positive (+) | Negative (-) | No Impact (0) |
| Target and Non-target Species | Overfished status defined by the MSA | Alternatives that would maintain or are projected to result in a stock status above an overfished condition* | Alternatives that would 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 resources, 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 will 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 marine mammals |
| Physical Environment / Habitat / EFH | Many habitats degraded from historical effort | Alternatives that improve the quality or quantity of habitat | Alternatives that degrade the quality, quantity or increase disturbance of habitat | Alternatives that do not impact habitat quality |
| Human Communities (Socioecon-omic) | Highly variable but generally stable in recent years | 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 |

| | Magnitude of Impact | |
|---|---|---|
| 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, as in slight positive or slight negative) | To a lesser degree / minor |
| | Moderately positive or negative | To an average degree (i.e., more than “slight”, but not “high”) |
| | High, as in high positive or high negative | To a substantial degree (not significant unless stated) |
| | Significant | 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 attribute aside from the MSA status, but this must be justified within the impact analysis.

## 7.1 Risk Policy Alternatives

Section 5.0 fully described the risk policy alternatives under consideration. For reference, a summary of the risk policy alternatives are provided in Table 17 below.

**Table 17:** Summary of the risk policy alternatives considered in this document.

| Alternative | Brief Description |
|---|---|
| 1A<br>*Status quo* | Linear ramping with a maximum P* of 0.4 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0; stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio is equal to or less than 0.1 |
| 2A | Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0; stock replenishment threshold (i.e., no fishing, P* equal to 0) when $B/B_{MSY}$ is equal to or less than 0.1 |
| 3A | Constant P* equal to 0.40 |
| 4A | Two step P* - constant P* equal to 0.40 for $B/B_{MSY}$ ratios less than 1.0 and a constant P* of 0.45 for $B/B_{MSY}$ ratios equal to or greater than 1.0 |
| 5A | Three step P* - constant P* equal to 0.35 when the $B/B_{MSY}$ ratio is less than 0.75, constant P* of 0.40 when the $B/B_{MSY}$ ratio is between 0.75 and 1.0 and a constant P* of 0.45 when the $B/B_{MSY}$ ratio is equal to or greater than 1.0 |
| 6A | Linear ramping with a maximum P* of 0.40 when the $B/B_{MSY}$ ratio is less than or equal to 1.0 and a linear ramping with a maximum P* of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5; stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio is equal to or less than 0.1 |
| 7A | Current risk policy with a stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio is equal to or less than 0.3 |
| 8A | Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5 and a stock replenishment threshold (P* equal to 0) when the $B/B_{MSY}$ ratio less than or equal to 0.3 |
| 9A<br>Preferred | Linear ramping with a maximum P* of 0.45 when the $B/B_{MSY}$ ratio is less than or equal to 1.0, and a linear ramping to a maximum of 0.49 when the $B/B_{MSY}$ ratio is equal to or greater than 1.5 and a stock replenishment threshold (i.e., no fishing, P* equal to 0) when the $B/B_{MSY}$ ratio less than or equal to 0.1 |

### 7.1.1 Impacts on Managed and Non-Target Species

The risk policy alternatives evaluated here consider the Council's tolerance of risk for overfishing (P*) under different stock biomass conditions. The risk policy, in conjunction with the SSC application of the ABC control rule to account for scientific uncertainty, establish catch limits that are intended to limit overfishing. The risk policy alternatives have a maximum probability of overfishing that range from 40 percent to 49 percent, all below the 50 percent maximum allowed by law (USDC 1999) which mitigates the negative biological impacts to the managed resources. In general, all of risk policy alternatives limited the risk of overfishing under "average" and "good" recruitment and natural mortality conditions; while the linear ramping P* alternatives (Alternatives 1A (*status quo*), 2A, 6A, 7A, 8A, and 9A (preferred)) were better at preventing overfishing and reduced the risk of a population declining to low levels particularly under poor recruitment and high natural mortality conditions when compared to the constant/stepped alternatives (Alternatives 3A, 4A, and 5A). These linear ramping alternatives are intended to prevent stocks from becoming overfished by reducing the probability of overfishing as the stock size falls below the $B_{MSY}$ target. Due to the linear ramping approach and the lowest maximum P* of 40 percent, Alternative 1A (*status quo*) and 7A were the most risk adverse alternatives and resulted in the lowest catches, on average, compared to all other alternatives.

The alternatives considered here do not modify the existing commercial quotas or recreational harvest limits set through the standard specification setting process and are based on the best scientific information available, but there could be indirect impacts associated with the resulting catch limits that are derived from the application of a Council risk policy under alternatives 2A – 9A, depending on whether the policy results in lower or higher catch levels relative to the *status quo* (Alternative 1A). However, these impacts would not be expected to depart substantially from those levels associated with *status quo*. Future catch levels for the managed resources that result from the application of a risk policy intended to reduce the risk of overfishing would result in indirect long-term positive biological impacts. As such, the anticipated indirect biological impacts associated with Alternatives 2A – 9A, would be neutral to slight positive, when compared to the *status quo*.

The Council's preferred alternative (Alternative 9A) minimized overall risk while allowing for moderate increases in catch when compared to the *status quo* (Alternative 1A). Alternative 9A did result in slightly higher risk (higher probability of overfishing and becoming overfished) when compared to the *status quo* but, even with this slight increase in risk, there was no scenario in which Alternative 9A resulted in a probability of overfishing that exceeded 50% and only under persistent poor stock productivity conditions did the probability of becoming overfished exceed 50%, which occurred for all alternatives considered, including *status quo*.

When compared to each other, the *status quo* and Alternative 7A, have the lowest average level of risk, the lowest average catch levels and would result in highest positive impacts for managed and non-target species. This would be followed by the remaining ramped alternatives (Alternatives 2A, 6A, 8A, and 9A) which limit the risk of overfishing across all scenarios considered. The constant or stepped alternatives (Alternatives 3A, 4A, and 5A) would have the lowest positive impact.

### 7.1.2 Impacts on Physical Habitat

The risk policy alternatives (1A – 9A) are administrative and procedural in nature and consider a variety of approaches to specify the level of risk to overfishing under different stock biomass conditions but do not specify commercial or recreational catch levels for Council-managed fisheries. There could be indirect impacts associated with changes in fishing effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternatives 2A – 9A, however these potential changes in fishing effort are not be expected to depart substantially from those levels associated with *status quo* (Alternative 1A). Therefore, none of the alternatives are expected to impact the fleet dynamics and fishing effort of Council-managed fisheries and unlikely to further degrade habitat beyond its current state. Evaluation of the effects of fishing effort on habitat will be evaluated in future specification EAs for Council-managed fisheries and changes to the risk policy would be applied as part of the process that would establish new catch limits.

As such, all alternatives evaluated would have similar indirect habitat impacts. Relative to each other, and Alternative 1A (*status quo*), and Alternatives 2A-9A would have neutral impacts on habitat, including EFH.

#### 7.1.3 Impacts on Protected Resources

Similar to the conclusion on habitat, the alternatives considered here are administrative and procedural in nature and will likely have little effect on fleet dynamics or fishing effort as the Omnibus Framework is a description of the Council's level of risk to overfishing and a part of the process that will be utilized to set an ABC. While there could be indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternatives 2A – 9A, these potential changes in effort are not be expected to depart substantially from those levels associated with *status quo* (Alternative 1A). Therefore, it is anticipated that these alternatives will likely have no direct impact on current protected resource conditions but would allow for continued recreational and commercial operations which will continue to interact with protected species and result in takes of those species. The Council will assess the potential impacts to ESA proposed, threatened, or endangered species when utilizing the risk policy established through this Omnibus Framework to set catch limits in subsequent years.

#### 7.1.4 Impacts on Human Communities (Socioeconomic Impacts)

The alternatives considered here do not modify existing commercial quotas or recreational harvest limits for Council-managed fisheries and, therefore, will not have any direct socioeconomic impacts. However, the risk policy alternatives specify the amount of risk to overfishing (P*) and future catch limits are derived from the application of a Council risk policy. Alternatives with a higher P* generally result in higher catches than those with a lower P*. Therefore, Alternatives 2A – 9A may result in lower or higher catch levels relative to the *status quo* (Alternative 1A).

The constant/stepped alternatives (Alternative 3A, 4A, and 5A), on average, result in higher short-term (next 5 years) catch and greater economic welfare when compared to the ramped alternatives (Alternative 1A, 2A, 6A, 7A, 8A, and 9A). These alternatives also minimize the amount of change and variability in catch levels between years which can provide stability to fishing behavior. However, these results are highly dependent upon starting biomass condition and most pronounced when starting biomass is below the $B_{MSY}$ target. Long-term catch, economic welfare, and catch stability are more similar across alternatives as stocks stabilize around the $B_{MSY}$ target. Therefore, the anticipated indirect socioeconomic impacts associated with Alternatives 2A – 9A, would range from slight negative to slight positive, when compared to the *status quo*.

The Council's preferred alternative (Alternative 9A) resulted in greater benefits to the fishery (catch, economic benefit and stability) compared to the *status quo* alternative and, according to the economic model, would result in an annual increase in economic welfare of more than $7.2 million ($36 million over five years) to the summer flounder fisheries over the *status quo* alternative.

When compared to each other, in general, the constant or stepped alternatives (Alternatives 3A, 4A, and 5A) result in the highest average catch levels and economic benefit and would have the greatest positive socioeconomic impact. This would be followed most of the ramped alternatives, including Alternative 2A, 6A, 8A, and 9A. The *status quo* alternative (Alternative 1) followed by Alternative 7A have the lowest average catch and economic benefit and the lowest positive socioeconomic impact.

## 7.2 Typical/Atypical Designation Alternatives

Section 5.0 fully described the typical/atypical designation alternatives under consideration. For reference, a summary of the typical/atypical designation alternatives are provided in Table 18 below.

**Table 18:** Summary of the typical/atypical designation alternatives considered in this document.

| Alternative | Brief Description |
|---|---|
| 2A<br>*Status quo* | The SSC determines whether a stock is typical or atypical each time an ABC is recommended. Similar to the approach taken with the current risk policy for "typical" species, the P* associated with an "atypical" species is conditional on current stock biomass relative to $B_{MSY}$ but has a maximum P* set at 0.35 instead of 0.4. |
| 2B<br>Preferred | Eliminate the typical/atypical distinction in the risk policy |

### 7.2.1 Impacts on Managed and Non-Target Species

The typical/atypical designation alternatives are administrative in nature and do not modify existing catch limits for Council-managed fisheries. Under Alternative 1 (*status quo*), during each ABC recommendation, the SSC would continue to designate a stock as typical/atypical based on stock assessment results and, if designated as atypical, a lower probability of overfishing would be implemented in the risk policy. Alternative 2B would remove this designation and the same application of the risk policy would apply to all species, regardless of life-history. While Alternative 2B could result in potentially higher catches for a species when compared to the *status quo*, the atypical designation has only been applied to ocean quahog and the upper limit on the risk of overfishing is capped at 50 percent. Therefore, catch levels and associated impacts are expected to be similar between the two alternatives. Future catch levels under both alternatives are intended to limit the risk of overfishing and would result in indirect long-term positive biological impacts.

Mid-Atlantic stock assessments and modeling approaches continue to make significant improvements and advancements and can more appropriately account for and address a species vulnerability to over-exploitation. These stock assessment improvements have also resulted in better quantitatively derived biological reference points to appropriately capture the unique life-history characteristics of a particular species. In addition, the new Northeast Region Coordinating Council (NRCC) stock assessment process designed to support research and stock assessment improvements will further enhance the regions stock assessment science to more comprehensively account for a species life-history dynamics. Given these improvements in accounting for a species vulnerability to over-exploitation and the limited use of the atypical designation by the SSC, the Council selected Alternative 2B as its preferred alternative.

When compared to one another, Alternative 2A would implement a lower risk of overfishing and lower catches if deemed appropriate by the SSC for atypical stocks and would result in higher positive biological impacts for managed and non-target species compared to Alternative 2B.

### 7.2.2 Impacts on Habitat

The typical/atypical designation alternatives (1B – 2B) are administrative and procedural in nature and consider the level of risk to overfishing for species designated by the SSC as atypical but do not specify commercial or recreational catch levels for Council-managed fisheries. There could be indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternative 2B; however this atypical designation has only been applied to ocean quahog and the potential changes in effort are not be expected to depart substantially, if at all, from those levels associated with *status quo* (Alternative 1B). Therefore, neither alternative is expected to impact the fleet dynamics and fishing effort of Council-managed fisheries and unlikely to further degrade habitat beyond its current state. As such, both alternatives evaluated would have similar indirect habitat impacts.

### 7.2.3 Impacts on Protected Resources

Similar to the conclusion on habitat, the alternatives considered here are administrative and procedural in nature and will likely have little effect on fleet dynamics or fishing effort. While there could be  indirect impacts associated with changes in effort relative to the resulting catch limits that are derived from the application of the Council risk policy under Alternative 2B, these potential changes in effort are not be expected to depart substantially, if at all, from those levels associated with *status quo* (Alternative 2A). Therefore, it is anticipated that both alternatives will likely have no direct impact on current protected resource conditions but would allow for continued recreational and commercial operations which will continue to interact with protected species and result in takes of those species.

### 7.2.4 Impacts on Human Communities (Socioeconomic Impacts)

The alternatives evaluated here consider designating a stock as typical/atypical by the SSC when making ABC recommendations and reducing the amount of risk to overfishing for a stock designated as atypical. Therefore, the alternatives considered here do not modify existing commercial quotas or recreational harvest limits for Council-managed fisheries and, therefore, will not have any direct socioeconomic impacts. The atypical designation has only been applied to ocean quahog and, therefore, its anticipated that future catch levels are expected to be very similar between the two alternatives for nearly all Council-managed fisheries. Even for ocean quahog, the commercial quota over the last 15 years has been set well below the ABC (57% of the ABC, on average) and, therefore, even under Alternative 2B, ocean quahog landings and fleet dynamics will likely not change compared to the *status quo*.

Since Alternative 2B could result in potentially higher catches limits for a species (e.g., ocean quahog) when compared to the *status quo*, and could result in slightly positive socioeconomic impacts.

## 7.3 Cumulative Effects Analysis

### 7.3.1 Introduction

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ; 40 CFR part 1508.7) and NOAA policy and procedures for NEPA, found in NOAA

Administrative Order 216-6A (Companion Manual, January 13, 2017). The purpose of the CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective. Rather, the intent is to focus on those effects that are truly meaningful. The following remarks address the significance of the expected cumulative impacts as they relate to all stocks covered under 6 different FMPs that federally managed by the Mid-Atlantic Fishery Management Council (Council).

A cumulative effects assessment ideally makes effect determinations based on a combination of: 1) impacts from past, present, and reasonably foreseeable future actions; 2) the baseline conditions of the VECs (the combined effects from past, present, and reasonably foreseeable future actions plus the present condition of the VEC); and 3) impacts of the alternatives under consideration for this action.

#### 7.3.1.1 Consideration of Valued Ecosystem Components (VECs)

The valued ecosystem components for the Council-managed fisheries are generally the “place” where the impacts of management actions occur, and are identified in section 6.0.

- Managed resources
- Non-target species
- Physical habitat
- Protected species
- Human communities

The CEA identifies and characterizes the impacts on the VECs by the alternatives under consideration when analyzed in the context of other past, present, and reasonably foreseeable future actions.

#### 7.3.1.2 Geographic Boundaries

The analysis of impacts focuses on actions related to Council-managed resources. The Western Atlantic Ocean, primarily from Maine to Florida, is the core geographic scope for each of the VECs, as this covers the core geographic scope for the managed resources (section 6.1). For non-target species, that range may be expanded and would depend on the range of each species in the Western Atlantic Ocean, but again focuses on the region from Maine to Florida (section 6.2). For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by the managed resources, and non-target species in the Western Atlantic Ocean, primarily in the marine waters from Maine to Florida (section 6.3). The core geographic scope for protected species is their range in the Western Atlantic Ocean, primarily in the marine waters from Maine to Florida (section 6.4). For human communities, the core geographic boundaries are defined as those U.S. fishing communities in coastal states from Maine to Florida directly involved in the harvest or processing of the managed resources (section 6.5).

#### 7.3.1.3 Temporal Boundaries

Overall, while the effects of the historical managed resources are important and considered in the analysis, the temporal scope of past and present actions for the managed resources, non-target species and other fisheries, the physical environment and EFH, and human communities is primarily focused on actions that occurred after 1976, when fisheries management began under MSA (see section 4.2 for FMP implementation date for each managed resource). An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery. For protected species, the scope of past and present actions is focused on the 1980s and 1990s (when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ) through the present.

The temporal scope of future actions for all VECs extends about five years (2025) into the future beyond the implementation of this action. The dynamic nature of resource management for these species and lack of information on projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty. The impacts discussed in Section 7.0 are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

### 7.3.2 Relevant Actions Other Than Those Proposed in this Document

This section summarizes the past, present, and reasonably foreseeable future actions and effects that are relevant for this cumulative effects assessment. Some past actions are still relevant to the present and/or future actions.

#### 7.3.2.1 Fishery Management Actions

Past, present, and reasonably foreseeable future management actions for Council-managed resources include the establishment of the original FMP, all subsequent amendments and frameworks, and the setting of annual specifications (annual catch limits and measures to constrain catch and harvest).

The historical management practices of the Council have resulted in positive impacts on the health of the managed resources. Numerous actions have been taken to manage these commercial and recreational fisheries through FMP amendment and FMP framework adjustment actions. The annual (or multi-year) specifications process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fisheries and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of each FMP and the targets associated with any rebuilding programs under the FMP.

The earliest management actions implemented under the Council's FMPs involved the sequential phasing out of foreign fishing for these species in US waters and the development of domestic fisheries. All Council-managed species are considered to be fully utilized by the US domestic fishery to the extent that sufficient availability will result in a full harvest of the various quotas. More recent actions have focused on stock rebuilding, reducing non-target catch and discards, reducing habitat impacts, and reducing protected species impacts. Limited access and/or catch shares have been established in all directed Council-managed fisheries to control capacity. All Council-managed fisheries have a variety of reporting and monitoring requirements to document catch and facilitate regulatory compliance with a focus on timely and reliable electronic reporting methods. Based on the 2007 MSA reauthorization and the Council's ACL/AM Omnibus Amendment, the SSC now sets an upper limit (ABCs) on catches to avoid overfishing. There is also a Standardized Bycatch Reporting Methodology (SBRM) to evaluate discards and allocate observer coverage. A full list of Council FMPs and their amendments is available at http://www.mafmc.org/fishery-management-plans.

The MSA is the statutory basis for federal fisheries management. To the degree with which this regulatory regime is complied, the cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the VECs should generally be associated with positive long-term outcomes. Constraining fishing effort through regulatory actions can have negative short-term socioeconomic impacts. These impacts are sometimes necessary to bring about long-term sustainability of a resource, and as such should promote positive effects on human communities in the long-term. Generally, FMP actions have had slight negative impacts on habitat, due to continued fishing operations which impact physical habitat. FMP actions have also had neutral impacts on protected species, including ESA-listed species.

In addition to the managed resource FMPs, there are many other FMPs and associated fishery management actions for other species that impacted these VECs over the temporal scale described in Section 7.3.1.3. These include FMPs managed by the Mid-Atlantic Fishery Management Council, New England Fishery Management Council, Atlantic States Marine Fisheries Commission, and to a lesser extent the South Atlantic Fishery Management Council. Omnibus amendments are also frequently developed to amend multiple FMPs at once. Actions associated with other FMPs and omnibus amendments have included measures to regulate fishing effort for other species, measures to protect habitat and forage species, and fishery monitoring and reporting requirements.

For example, the NEFMC's omnibus habitat amendment revised EFH and habitat area of particular concern designations for NEFMC-managed species; revised or created habitat management areas, including gear restrictions to protect vulnerable habitat from fishing gear impacts; and established dedicated habitat research areas. This action is expected to have overall positive impacts on habitat and EFH, with expected long-term positive implications for target and non-target species, while having mixed socioeconomic impacts on various user groups.

The MAFMC's omnibus forage amendment, implemented in 2017, established a commercial possession limit for over 50 forage species which were previously unmanaged in federal waters. This action is thought to have ongoing positive impacts to target, non-target, and protected species by protecting a forage base for these populations and limiting the expansion of any existing fishing effort on forage stocks.

The convening of take reduction teams for marine mammals over the temporal scope described in section 7.3.1.3 has had positive impacts for marine mammals via recommendations for management measures to reduce mortality and injury to marine mammals. These actions have had indirect positive impacts on target species, non-target species, and habitat as they have improved monitoring of fishing effort and reduced the amount of gear in the water. These measures have had indirect negative impacts on human communities through reduced fishery efficiency.

In the reasonably foreseeable future, the MAFMC and NEFMC are considering modifications to observer coverage requirements through an omnibus amendment that considers measures that would allow the Councils to implement industry-funded monitoring coverage in some FMPs above levels required by the Standard Bycatch Reporting Methodology in order to assess the amount and type of catch, monitor annual catch limits, and/or provide other information for management. This action could have long-term positive impacts on target species, non-target species, and protected species through improved monitoring and scientific data on these stocks. This could potentially result in negative socioeconomic impacts to commercial fishing vessels due to increased costs.

As with all the managed resource FMP actions described above, other FMP actions have had positive long-term cumulative impacts on managed and non-target species because they constrain fishing effort and manage stocks at sustainable levels. As previously stated, constraining fishing effort can have negative short-term socioeconomic impacts and long-term positive impacts. These actions have typically had slight negative impacts on habitat, due to continued fishing operations preventing impacted habitats from recovering; however, some actions had long-term positive impacts through designating or protecting important habitats. FMP actions have also had a range of impacts on protected species, including generally slight negative impacts on ESA-listed species, and slight negative to slight positive impacts on non ESA-listed marine mammals, depending on the species.

#### 7.3.2.2 Non-Fishing Impacts

##### *7.3.2.2.1 Other Human Activities*

Non-fishing activities that occur in the marine nearshore and offshore environments and connected watersheds can cause the loss or degradation of habitat and/or affect the fish and protected species that utilize those areas. The impacts of most nearshore, human-induced, non-fishing activities tend to be localized in the areas where they occur, although effects on species could be felt throughout their populations since many marine organisms are highly mobile. For offshore projects, some impacts may be localized while others may have regional influence, especially for larger projects. The following discussion of impacts is based on past assessments of activities and assumes these activities will continue as projects are proposed.

Examples of non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore wind farms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these activities primarily stem from habitat loss due to human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts on habitat related to accretion of sediments, pollutants, habitat conversion, and shifting currents and thermoclines. For protected species, primary concerns associated with non-fishing activities include vessel strikes, dredge interactions (especially for sea turtles and sturgeon), and underwater noise. These activities have both direct and indirect impacts on protected species. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the productivity of managed species, non-target species, and protected species. Decreased habitat suitability tends to reduce the tolerance of these VECs to the impacts of fishing effort.  Non-fishing activities can cause target, non-target, and protected species to shift their distributions away from preferred areas, and may also lead to decreased reproductive ability and success (from current changes, spawning disruptions, and behavior changes), disrupted or modified food web interactions, and increased disease. While localized impacts may be more severe, the overall impact on the affected species and their habitats on a population level is unknown, but likely to have impacts that mostly range from no impact to slight negative, depending on the species and activity.

Non-fishing activities permitted by other Federal agencies (e.g. beach nourishment, offshore wind facilities) require examinations of potential impacts on the VECs. The MSA imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH (50 CFR 600.930). NMFS and the eight regional fishery management councils engage in this review process by making comments and recommendations on federal or state actions that may affect habitat for their managed species. Agencies need to respond to, but do not necessarily need to adopt these recommendations. Habitat conservation measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally-permitted activities could have on resources under NMFS' jurisdiction. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by Federal, state, and local authorities. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2)[8], which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

In recent years, offshore wind energy and oil and gas exploration have become more relevant activities in the Greater Atlantic region. They are expected to impact all VECs, as described below.

***Impacts of offshore wind energy development on Biological Resources (Target species, Non-target species, Protected Species) and the Physical Environment***

Construction activities may have both direct and indirect impacts on marine resources, ranging from temporary changes in distribution to injury and mortality. Impacts could occur from changes to habitat in the areas of wind turbines and cable corridors and increased vessel traffic to and from these areas. Species that reside in affected wind farms year round may experience different impacts than species that seasonally reside in or migrate through these areas. Species that typically reside in areas where wind turbines are installed may return to the area and adapt to habitat changes after construction is complete. Inter-array and electricity export cables will generate electromagnetic fields, which can affect patterns of movement, spawning, and recruitment success for various species. Effects will depend on cable type, transmission capacity, burial depth, and proximity to other cables. Substantial structural changes in habitats associated with cables are not expected unless cables are left unburied (see below). However, the cable burial process may alter sediment composition along the corridor, thereby affecting infauna and emergent biota. Taormina et al. (2018) provide a recent review of various cable impacts, and Hutchinson et al. (2020) and Taormina et al. (2020) examine the effects of electromagnetic fields in particular.

[8] "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat."

The full build out of offshore wind farms will result in broad habitat alteration. The wind turbines will alter hydrodynamics of the area, which may affect primary productivity and physically change the distribution of prey and larvae. It is not clear how these changes will affect the reproductive success of marine resources. Scour and sedimentation could have negative effects on egg masses that attach to the bottom. Benthic habitat will be altered due to the placement of scour protection at wind turbine foundations, and over cables that are not buried to target depth in the sediment, converting soft substrates into hard substrates. This could alter species composition and predator/prey relationships by increasing favorable habitat for some species and decreasing habitat for others. The placement of wind turbines will also establish new vertical structure in the water column, which could serve as reefs for bottom species, fish aggregating devices for pelagic species, and substrate for the colonization of other species, e.g. mussels. Various authors have studied these types of effects (e.g. Bergström et al. 2013, Dannheim et al. 2019, Degraer et al. 2019, Langhamer 2012, Methratta and Dardick 2019, Stenberg et al. 2015).

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape[9]. Temporary, acute, noise impacts from construction activity could impact reproductive behavior and migration patterns; the long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015; Finneran 2016; Nowacek et al. 2007; NRC 2000; NRC 2003; NRC 2005; Madsen et al. 2006; Piniak 2012; Popper et al. 2014; Richardson et al. 1995; Thomsen et al. 2006). Exposure to underwater noise can directly affect species via behavioral modification (avoidance, startle, spawning) or injury (sound exposure resulting in internal damage to hearing structures or internal organs) (Bailey et al. 2010; Bailey et al. 2014; Bergström et al. 2014; Ellison et al. 2011; Ellison et al. 2018; Forney et al. 2017; Madsen et al. 2006; Nowacek et al. 2007; NRC 2003; NRC 2005; Richardson et al. 1995; Romano et al. 2004; Slabbekoorn et al. 2010; Thomsen et al. 2006; Wright et al. 2007). Indirect effects are likely to result from changes to the acoustic environment of the species, which may affect the completion of essential life functions (e.g., migrating, breeding, communicating, resting, foraging)[10] (Forney et al. 2017; Richardson et al. 1995; Slabbekoorn et al. 2010;Thomsen et al. 2006).

Wind farm survey and construction activities and turbine/cable placement will substantially affect NMFS scientific research surveys, including stock assessment surveys for fisheries and protected species[11] and ecological monitoring surveys. Disruption of such scientific surveys could increase scientific uncertainty in survey results and may significantly affect NMFS' ability to monitor the health, status, and behavior of marine resources and protected species and their habitat use within this region. Based on existing regional Fishery Management Councils'

[9] See NMFS Ocean Noise Strategy Roadmap: https://cetsound.noaa.gov/Assets/cetsound/documents/Roadmap/ONS_Roadmap_Final_Complete.pdf

[10] See NMFS Ocean Noise Strategy Roadmap (footnote #2)

[11] Changes in required flight altitudes due to proposed turbine height would affect aerial survey design and protocols (BOEM 2020a).

acceptable biological catch control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and recreational harvest limits that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower associated fishing revenue and reduced recreational fishing opportunities, which could result in indirect negative impacts on fishing communities.

***Impacts of Offshore Wind Energy Development on Socioeconomic Resources***

One offshore wind pilot project off Virginia installed two turbines in 2020**.** Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Massachusetts to North Carolina (see leasing map below – Figure 14). According to BOEM, approximately 22 gigawatts (close to 2,000 wind turbines based on current technology) of Atlantic offshore wind development via 17 projects are reasonably foreseeable along the east coast (BOEM 2020a). As the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities.

Offshore wind energy development is being considered in parts of the outer continental shelf that overlap with nearly all Council-managed resources. Recent habitat modeling work by the NEFSC and presented as part of the 2020 Mid-Atlantic State of the Ecosystem Report found that summer flounder, butterfish, longfin squid, and spiny dogfish are highly likely to occupy wind lease areas throughout the region (NEFSC 2020). Habitat conditions for those species is projected to become more favorable over time within the lease areas, potentially leading to increased interactions and impacts over time. Fisheries for the managed resources have been active in many of the lease areas at present and are expected to be for the near future (section 6.0). For example, some of the highest commercial summer flounder catch in 2019 occurred in lease areas south of Cape Cod, Massachusetts and Rhode Island and in lease areas south of Long Island, NY (Figure 15). The social and economic impacts of offshore wind energy on fisheries could be generally negative due to the overlap of wind energy areas with productive fishing grounds for many Council-managed fisheries. Impacts may vary by species and by year depending upon habitat overlap, species availability, and any area-based regulations that define the amount and type of fishing access with the lease area.

BOEM recently released its Supplemental Draft Environmental Impact Statement (SEIS) for the Vineyard Wind project, an 800 megawatt wind farm southeast of Martha’s Vineyard, Massachusetts (BOEM 2020). The SEIS evaluated the revenue exposure (defined as the dockside value of the fish caught within induvial lease areas) of various Mid-Atlantic and New England commercial fisheries found within future wind energy lease areas. For most Council-managed fisheries, less than 3 percent of the total revenue would be exposed to future offshore wind development (see table 3.11.-3, section B-78). The analysis noted that the Atlantic surfclam and ocean quahog fisheries represented the largest combined percent exposure and dollar value (BOEM 2020). The SEIS concluded that the impacts associated with future offshore wind activities in the geographic analysis area would result in major adverse impacts on commercial fisheries and moderate adverse impacts on for-hire recreational fishing due to the presence of structures

● Depending on the fishery, there is the potential for substantial overlap between a lease area and fishing operation, and it's worth noting that this analysis represents only a rough approximation of potential effects from the areas; however, because this productive region of the resource would be expected to support these fisheries in the future in the absence of offshore wind energy development, any restriction of fishing access to this region as a result of offshore wind energy development would be perceived as a negative overall effect to the fishery. In some cases, effort could be displaced to another area, which could compensate for potential economic losses if vessel operators choose not to operate in the wind energy areas.

● Its also worth noting, that turbine structures could increase the presence of and fishing for structure affiliated Council-managed species, such as black sea bass. Many recreational fishing trips in this region target a combination of species. For example, recreational trips which catch black sea bass often also catch tautog, scup, summer flounder, and Atlantic croaker (NEFSC 2017). For this reason, increased recreational fishing effort focusing on species such as black sea bass in wind farms could also lead to increased recreational catches of other species. This could lead to socioeconomic benefits in terms of increased for-hire fishing revenues and angler satisfaction in certain wind development areas.

There could also be social and economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable sources (AWEA 2020).

It remains unclear how fishing or transiting to and from fishing grounds (whether or not those grounds are within a wind farm) might be affected by the presence of a wind farm. While no offshore wind developers have expressed an intent to exclude fishing vessels from wind turbine arrays once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing and orientation of the array and weather conditions.[12] If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative socioeconomic impacts to affected communities, including increased user conflicts, decreased catch and associated revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind farms, effects could be both positive and negative for various managed resources. Fishing within wind farms could lead to increased catch rates, decreased steaming searching for concentrations of fish and different size availability (e.g., larger fish found within a wind farm) which would result in positive effects. However negative effects could occur due to the potential for reduced catch and associated revenue, user conflicts, gear damage/loss, and increased risk of allision or collision.

[12] The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study, and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (UCSG 2020).

***Impacts of Oil and Gas Development on Biological and Socioeconomic Resources***

For oil and gas, this timeframe could include leasing and possible surveys, depending on the direction of BOEM's 5-year planning process in the North and Mid-Atlantic regions. (Note that there are fewer oil and gas development activities in the region than offshore wind; therefore, the non-fishing impacts focus more heavily on offshore wind.) Seismic surveys to detect and quantify mineral resources in the seabed impact marine species and the acoustic environment within which marine species live. These surveys have uncertain impacts on fish behaviors that could cumulatively lead to negative population level impacts. For protected species (sea turtle, fish, small cetacean, pinniped, large whale), the severity of these behavioral or physiological impacts is based on the species' hearing threshold , the overlap of this threshold with the frequencies emitted by the survey, as well as the duration of time the surveys would operate, as these factors influence exposure rate (Ellison et al. 2011; Ellison et al. 2018; Finneran 2015; Finneran 2016; Madsen et al. 2006; Nelms et al. 2016; Nowacek et al. 2007; Nowacek et al. 2015; NRC 2000; NRC 2003; NRC 2005; Piniak 2012; Popper et al. 2014; Richardson et al. 1995; Thomsen et al. 2006; Weilgart 2013). If fishery resources are affected by seismic surveys, then so in turn the fishermen targeting these resources would be affected. However, such surveys could increase jobs, which may provide some positive effects on human communities (BOEM 2020b). It is important to understand that seismic surveys for mineral resources are different from surveys used to characterize submarine geology for offshore wind installations, and thus these two types of activities are expected to have different impacts on marine species.

***Offshore Energy Summary***

The overall impact of offshore wind energy and oil and gas exploration on the affected species and their habitats at a population level is unknown, but likely to range from no impact to moderate negative, depending on the number and locations of projects that occur. The individual project phases (site assessment, construction, operation, and decommissioning) as well as different aspects of the technology (foundations, cables/pipelines, turbines) will have varying impacts on resources. Mitigation efforts, such as habitat conservation measures, time of year construction restrictions, layout modifications, and fishery compensation funds could lessen the magnitude of negative impacts as well. The overall impact on socioeconomic resources is likely slight positive to moderate negative; potentially positive due to a potential increase in jobs and recreational fishing opportunities, but negative due to displacement and disruption of commercial fishing effort.

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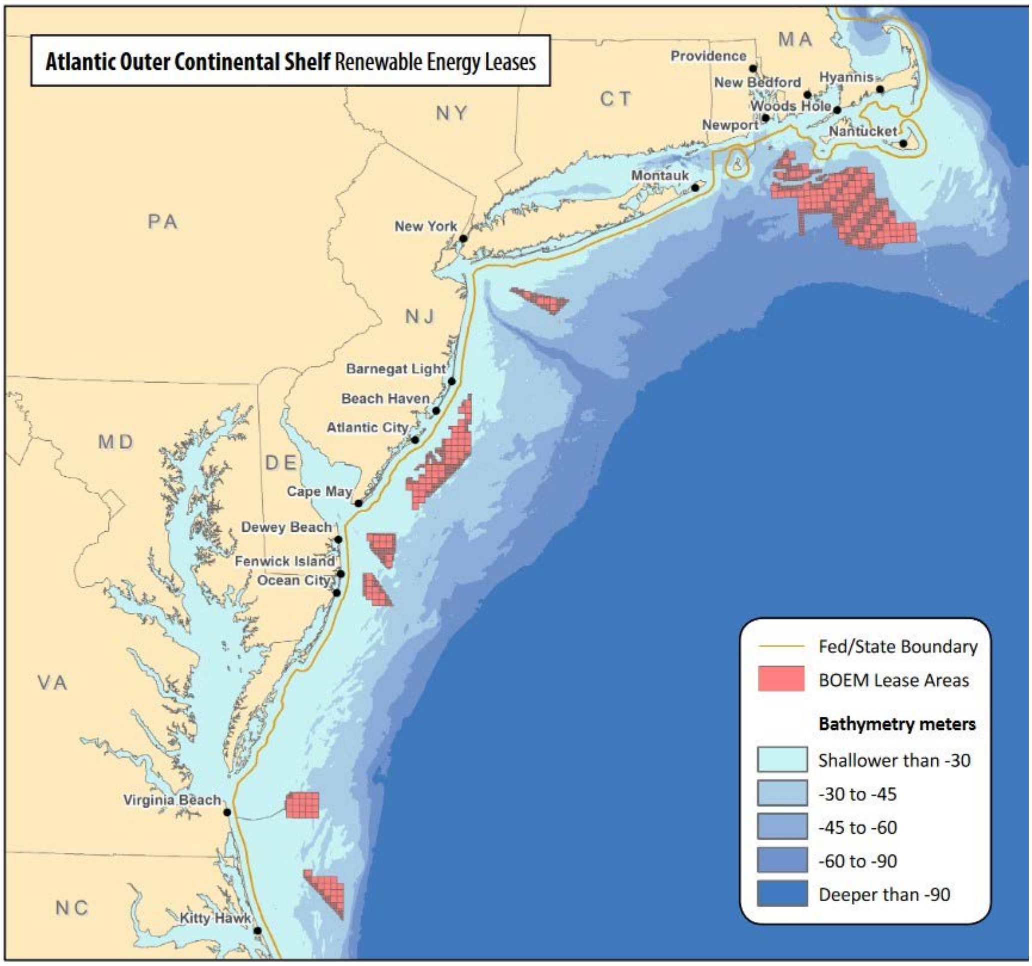


**Figure 14:** BOEM approved renewable energy lease areas in federal waters in the Atlantic Ocean off the Mid-Atlantic and New England (source: BOEM Map Book of Outer Continental Shelf Renewable Energy Lease Areas, https://www.boem.gov/sites/default/files/renewable-energy-program/Mapping-and-Data/Renewable_Energy_Leases_Map_Book_March_2019.pdf)

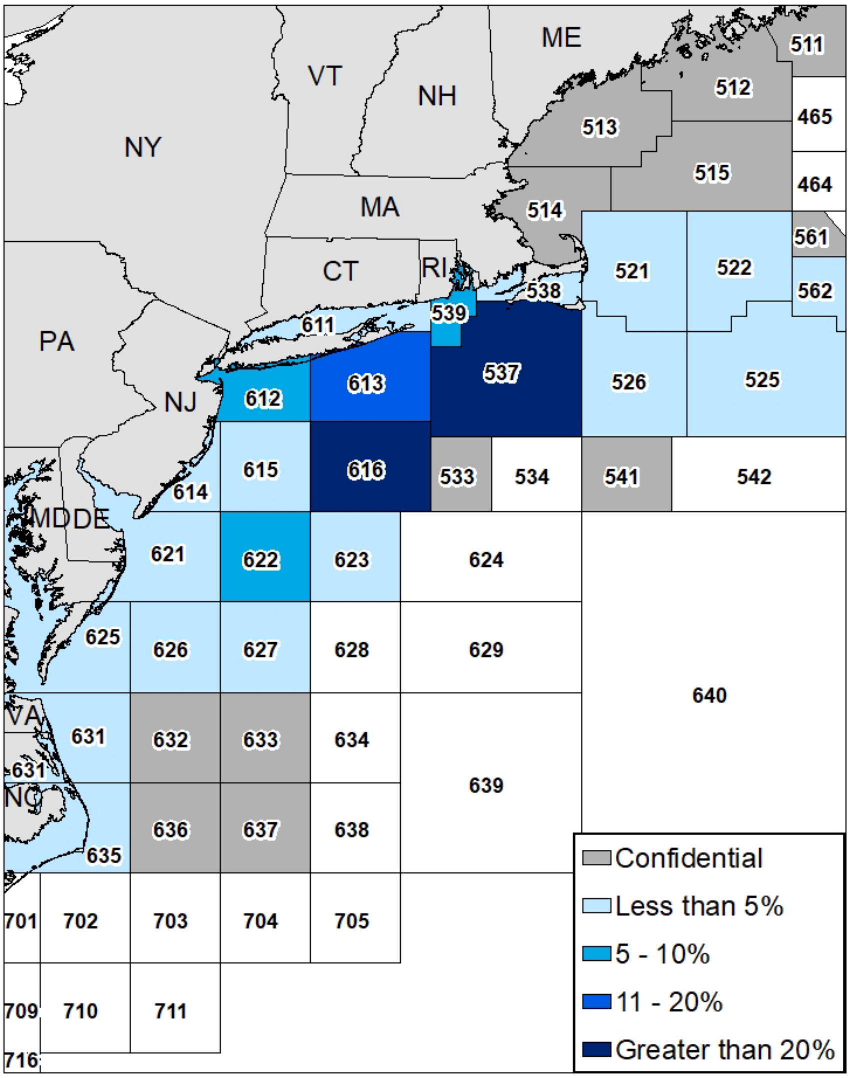


**Figure 15:** Proportion of summer flounder catch by NMFS statistical area in 2019 based on federal VTR data (MAFMC 2020).

###### *7.3.2.2.2 Global Climate Change*

Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity and duration of extreme climate events; changing ocean chemistry; and warming ocean temperatures. The rates of physical and chemical changes in marine ecosystems have been most rapid in recent decades (Johnson et al. 2019). Emerging evidence demonstrates that these physical changes are resulting in direct and indirect ecological responses within marine ecosystems, which may alter the fundamental production characteristics of marine systems (Stenseth et al. 2002). The general trend of changes can be explained by warming causing increased ocean stratification, which reduces primary production, lowering energy supply for higher trophic levels and changing metabolic rates. Different responses to warming can lead to altered food-web structures and ecosystem-level changes. Shifts in spatial distribution are generally to higher latitudes (i.e., poleward) and to deeper waters as species seek cooler waters within their normal temperature preferences. Climate change will also potentially exacerbate the stresses imposed by fishing and other non-fishing human activities and stressors. Survival of marine resources under a changing climate depends on their ability to adapt to change, but also how and to what degree those other human activities influence their natural adaptive capacity.

Results from the Northeast Fisheries Climate Vulnerability Assessment indicate that climate change could have impacts on Council-managed species that range from negative to positive, depending on the adaptability of each Council-managed species to the changing environment (Hare et al. 2016). It should be noted that at the time of this analysis, blueline tilefish and chub mackerel were not managed by the Council but have since been added as Council-managed species.

Based on this assessment, all Council-managed species have a high or very high exposure to climate change (Figure 16). For Council-managed species, ocean quahog was identified as being very highly sensitive to climate change, and three species (tilefish, Atlantic surfclam, and black sea bass) were highly sensitive to climate change. The remaining species had moderate or low sensitivity to a change in abundance and productivity due to climate change. A vast majority of Council-managed species had a high or very high potential for changes in distribution (12 of 13 species managed at time of analysis); only golden tilefish had a low potential for a change in distribution. Overall, the impacts of climate change are expected to be negative for three Council-managed species (Atlantic mackerel, Atlantic surfclam, and ocean quahog), whereas the impacts are expected to be positive for six species (black sea bass, scup, butterfish, longfin inshore squid, Northern shortfin squid (*Illex*), and bluefish; Figure 17). The effects of climate change are expected to be neutral for the remainder of Council-managed species

Overall vulnerability results for additional Greater Atlantic species, including many non-target species identified in this action, are shown in Figure 16 (Hare et al. 2016). While the effects of climate change may benefit some habitats and the populations of species through increased availability of food and nutrients, reduced energetic costs, or decreased competition and predation, a shift in environmental conditions outside the normal range can result in negative impacts for those habitats and species unable to adapt. This, in turn, may lead to higher mortality, reduced growth, smaller size, and reduced reproduction or populations. Thus, already stressed populations are expected to be less resilient and more vulnerable to climate impacts. Climate change is expected to have impacts that range from positive to negative depending on the species. However, future mitigation and adaptation strategies to climate change may mitigate some of these impacts. The science of predicting, evaluating, monitoring and categorizing these changes continues to evolve. The social and economic impacts of climate change will depend on stakeholder and community dependence on fisheries, and their capacity to adapt to change. Commercial and recreational fisheries may adapt in different ways, and methods of adaptation will differ among regions. In addition to added scientific uncertainty, climate change will introduce implementation uncertainty and other challenges to effective conservation and management.

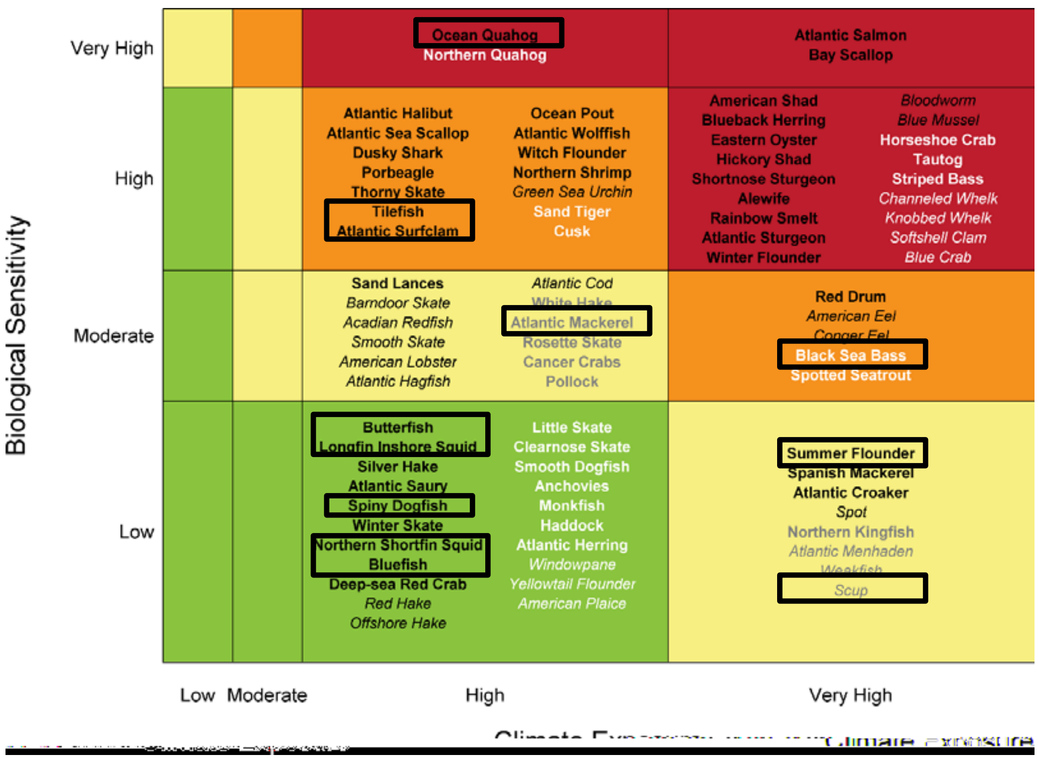


**Figure 16:** Overall climate vulnerability score for Greater Atlantic species, with Mid-Atlantic Council managed species highlighted with black boxes. Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90–95%, black, italic font), moderate certainty (66–90%, white or gray, bold font), low certainty (<66%, white or gray, italic font). Figure source: Hare et al. 2016.

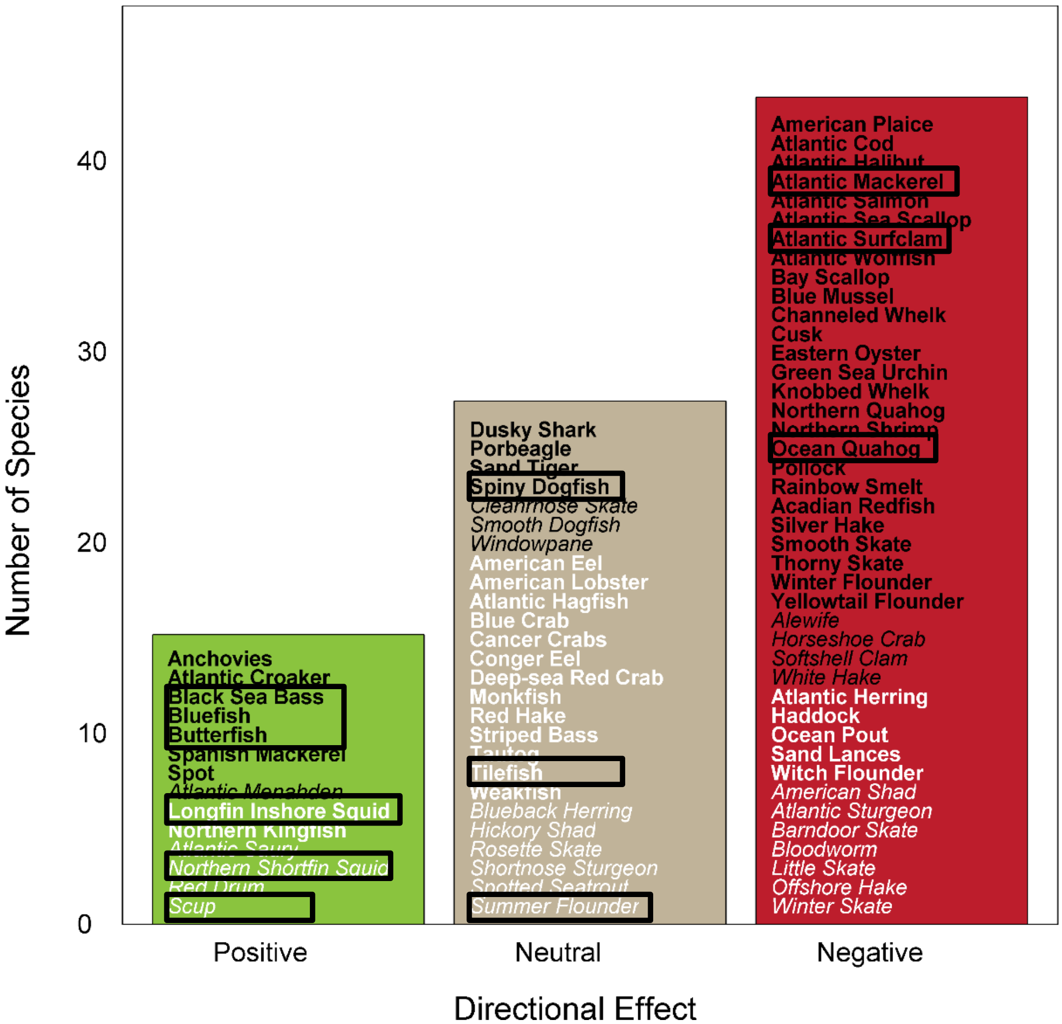


**Figure 17:** Directional effect of climate change for Council-managed species highlighted with black boxes. Colors represent expected negative (red), neutral (tan), and positive (green) effects. Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90-95%, black, italic font), moderate certainty (66-90%, white or gray, bold font), low certainty (<66%, white or gray, italic font). Figure source: Hare et al. 2016.

### 7.3.3 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action (i.e., the suite of preferred alternatives), as well as past, present, and future actions, must be taken into account. The following section describes the expected effects of these actions on each VEC. Those past, present, and reasonably foreseeable future actions which may impact the VECs, and the direction of those potential impacts, are summarized in section 7.3.2. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with "other" actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC. As seen above in section 7.3.2.2, non-fishing impacts on the VECs generally range from no impact to slight negative.

#### 7.3.3.1 Magnitude and Significance of Cumulative Effects on Managed Resources

Past fishery management actions taken through all Council-managed resource FMPs and the annual specifications process such as catch limits, commercial quotas, and RHLs, as appropriate, for the managed resource ensure that stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts of annual specification of management measures are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures (e.g., gear restricted areas, limited access, minimum mesh sizes etc.) are effective; however, these actions have generally had a positive cumulative effect on the managed resources. It is anticipated that the future management actions described in section 7.3.2.1 will have additional indirect positive effects on the target species through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on which the productivity of the target species depends.

As noted previously in sections 7.1.1 and 7.2.1, neither of the preferred alternatives are expected to result in significantly increased levels of fishing effort or changes to the character of that effort relative to current conditions. The modification of the Council's risk policy as identified in the preferred alternatives do not modify the existing commercial quotas or RHLs for any managed resource and it is through the application of this administrative process in the future with respect to catch limits, that impacts will be realized. Therefore, impacts of Council-managed fisheries on target species are not expected to change relative to current conditions under the preferred alternatives (i.e., generally positive for target species). The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on all managed resources by achieving the objectives specified in all FMPs.

When the direct and indirect effects of the risk policy and typical/atypical designation alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield non-significant positive impacts on the Council-managed resources.*

#### 7.3.3.2 Magnitude and Significance of Cumulative Effects on Non-Target Species

The combined impacts of past federal fishery management actions on non-target species have been mixed, as decreased effort and reduced catch of non-target species continue, though some stocks are in poor status. Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species. As noted in sections 7.4.2.1, future actions are anticipated to continue rebuilding non-target species stocks and limit the take of incidental/bycatch in Council-managed fisheries, particularly through mitigation measures like sub-ACLs, AMs, and bycatch catch caps. Measures proposed in this action would likely have primarily no impact on non-target species. Continued management of directed stocks will also control catch of non-target species.

As noted previously in section 7.1.1 and 7.2.1, neither of the preferred alternatives are expected to result in significantly increased levels of fishing effort or changes to the character of that effort relative to current conditions. The modification of the Council's risk policy as identified in the preferred alternatives do not modify the existing commercial quotas or RHLs for any managed resource and it is through the application of this administrative process in the future with respect to catch limits, that impacts will be realized. Therefore, impacts of all Council-managed fisheries on non-target species are not expected to change relative to the current condition under the preferred alternatives (i.e., slight positive for non-target species). The proposed actions in this document would positively reinforce past and anticipated cumulative effects on non-target species by achieving the objectives specified in all FMPs.

When the indirect effects of risk policy and typical/atypical designation alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield no impact to positive on non-target species.*

#### 7.3.3.3 Magnitude and Significance of Cumulative Effects on Physical Environment

Past fishery management actions taken through the federal fisheries management process have had positive cumulative effects on habitat. The actions have constrained fishing effort both at a large scale and locally which may reduce impacts on habitat. As required under these FMP actions, EFH and Habitat Areas of Particular Concern were designated for the managed stocks. It is anticipated that the future management actions described in section 7.3.2.1 will result in additional direct or indirect positive effects on habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends. These impacts could be broad in scope. All the VECs are interrelated; therefore, the linkages among habitat quality, managed and non-target species productivity, and associated fishery yields should be considered. For habitat, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and will likely continue to be, taken to improve the condition of habitat. Some actions, such as coastal population growth and climate change may impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management.

As described in sections 7.1.2 and 7.2.2, the proposed actions in this document are administrative, will not modify current commercial quotas and RHLs, and are not expected to have impacts on the prosecution of Council-managed fisheries, including landings levels, fishery distribution, or fishing methods and practices. The proposed action is not expected to result in changes to the manner in which Council-managed fisheries are prosecuted. The proposed actions are expected to have no impact (direct or indirect) on habitat. The impacted areas have been fished for many years with many different gear types and therefore will not likely be further impacted by these measures.

Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, *the cumulative effects are expected to yield non-significant impacts on habitat that range from no impact to slight negative.*

#### 7.3.3.4 Magnitude and Significance of Cumulative Effects on Protected Resources

Given their life history, large changes in protected species abundance over long time periods, and the multiple and wide-ranging fisheries management actions that have occurred, the cumulative impacts on protected species were evaluated over a long time frame (i.e., from the early 1970s when the MMPA and ESA were implemented through the present). While some protected species are doing better than others, the overall population trends have improved over the long-term due to reductions in the number of interactions.

Past fishery management actions have contributed to this long-term trend toward positive cumulative effects on protected species through the reduction of fishing effort and implementation of gear requirements, and thus a reduction in potential interactions. It is anticipated that future management actions, summarized in section 7.3.2.1, will result in additional indirect positive effects on protected species. These impacts could be broad in scope.

As described in sections 7.1.3 and 7.2.3, the proposed actions in this document are administrative, will not modify current commercial quotas and RHLs, and are not expected to have impacts on the prosecution of Council-managed fisheries, including landings levels, fishery distribution, or fishing methods and practices. The proposed action is not expected to result in changes to the manner in which Council-managed fisheries are prosecuted. The proposed actions are expected to have no impact (direct or indirect) on protected species.

Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, *the cumulative effects are expected to yield non-significant impacts on protected resources that are slightly positive for most species.*

#### 7.3.3.5 Magnitude and Significance of Cumulative Effects on Human Communities

Past fishery management actions taken through the respective FMPs and annual specifications process such as catch limits, commercial quotas, and RHLs have had both positive and negative cumulative effects on human communities. They have benefitted domestic fisheries through sustainable fishery management, but can also reduce participation in fisheries. The impacts from annual specification of management measures are largely dependent on how effective those measures are in meeting their intended objectives and the extent to which mitigating measures such as seasons and trip/possession limits are effective. Quota overages may alter the timing of commercial fishery revenues such that revenues can be realized a year earlier. Fishermen may be impacted by reduced revenues in years which the overages are deducted. Similarly, recreational fisheries may have decreased harvest opportunities due to reduced harvest limits as a result of overages and more restrictive management measures (e.g. minimum fish size, possession limits, fishing seasons) implemented to address overages.

It is anticipated that the future management actions described in section 7.3.2.1 will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on some human communities could occur if management actions result in reduced revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects. Despite the potential for negative short-term effects on human communities due to reduced revenue, positive long-term effects are expected due to the long-term sustainability of the managed stocks.

By providing revenues and contributing to the overall functioning of and employment in coastal communities, Council-managed fisheries have both direct and indirect positive social impacts. As previously described in sections 7.1.4 and 7.2.4, the preferred alternatives are unlikely to result in substantial changes to levels of fishing effort or the character of that effort relative to current conditions. However, once implemented through future the future specifications process, the preferred alternatives would result increased fishery yield, economic welfare, and catch stability for managed resources compared to the *status quo*. Through implementation of this action, the Council seeks to achieve the primary objective of the MSA, which is to achieve OY from the managed fisheries.

Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, *the cumulative effects are expected to yield non-significant slight positive impacts.*

### 7.3.4 Proposed Action on all the VECs

The Council's preferred alternatives (i.e. the proposed action) are described in section 5.0. The direct and indirect impacts of the proposed action on the VECs are described in sections 7.1 and 7.2 and are summarized in the Executive Summary. The magnitude and significance of the cumulative effects, including additive and synergistic effects of the proposed actions, as well as past, present, and future actions, have been taken into account (section 7.3.3).

When considered in conjunction with all other pressures placed on the fisheries by past, present, and reasonably foreseeable future actions, the preferred alternatives are not expected to result in any significant impacts, positive or negative. The preferred alternatives would implement a Council risk policy that will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. The preferred alternatives are expected to have slight positive impacts on the managed resources, non-target species, and human communities and will have no impact on habitat and protected species.

The preferred alternatives are consistent with other management measures that have been implemented in the past for all Council-managed resources. These measures are part of a broader management scheme for all Council-managed fisheries. This management scheme has helped to rebuild stocks and ensure long-term sustainability, while minimizing environmental impacts.

The regulatory atmosphere within which federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of managed species, habitat, and human communities. Consistent with NEPA, the MSA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs from past, present and reasonably foreseeable future actions have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the VECs are not experiencing negative impacts, but rather that when considered as a whole and as a result of the management measure implemented in these fisheries, the overall long-term trend is positive.

There are no significant cumulative effects associated with the preferred alternatives based on the information and analyses presented in this document and in past FMP documents (Table 19). Cumulatively, through 2025, it is anticipated that the preferred alternatives will result in non-significant impacts on all VECs, ranging from no impact to slight negative to positive.

**Table 19:** Summary of cumulative effects of the preferred alternatives.

| | Managed Resources | Non-Target Species | Habitat | Protected Resources | Human Communities |
|---|---|---|---|---|---|
| **Direct/Indirect Impacts of Preferred Alternatives** | Slight Positive (sections 7.1.1 and 7.2.1) | Slight Positive (sections 7.1.1 and 7.2.1) | No Impact (sections 7.1.2 and 7.2.2) | No Impact (7.1.3 and 7.2.3) | Slight Positive (section 7.1.4 and 7.2.4) |
| **Combined Cumulative Effects Assessment Baseline Conditions** | Positive (section 7.4.3.1) | No Impact to Positive (7.4.3.2) | No Impact to Slight Negative (7.4.3.3) | Slight Positive (section 7.4.3.4) | Slight Positive (section 7.4.3.5) |
| **Cumulative Effects** | None | None | None | None | None |

# 8.0 APPLICABLE LAWS

## 8.1 Magnuson-Stevens Fishery Conservation and Management Act (MSA)

### 8.1.1 National Standards

Section 301 of the MSA requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. The Council continues to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that will continue to prevent overfishing, while achieving, on a continuing basis, the optimum yield (OY) for all managed resources, and the U.S. fishing industry. To achieve OY, both scientific and management uncertainty are addressed when establishing catch limits. The Council developed recommendations that do not exceed the ABC recommendations of the SSC, which explicitly address scientific uncertainty. The Council considered management uncertainty and other social, economic, and ecological factors, when recommending ACTs. The Council uses the best scientific information available (National Standard 2) and manages the managed resources throughout their range (National Standard 3). These management measures do not discriminate among residents of different states (National Standard 4) and they do not have economic allocation as their sole purpose (National Standard 5). The measures account for variations in the fisheries (National Standard 6) and avoid unnecessary duplication (National Standard 7). They take into account the fishing communities (National Standard 8) and they promote safety at sea (National Standard 10). The proposed actions are consistent with National Standard 9, which addresses bycatch in fisheries. By continuing to meet the National Standards requirements of the MSA through future FMP amendments, framework actions, and the annual specification setting process, the Council will insure that cumulative impacts of these actions will remain positive overall for the managed species, the ports and communities that depend on these fisheries, and the Nation as a whole.

## 8.2 NEPA Finding of No Significant Impact (FONSI)

The Council on Environmental Quality 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 NOAA

Administrative Order 216-6A provides sixteen criteria (the same ten as the Council on Environmental Quality 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?*

The expected impacts of the proposed action (i.e., the suite of preferred alternatives) are fully described in section 7. The preferred alternatives are not expected to result in significant impacts on any VECs, nor will they result in overall significant effects, either beneficial or adverse.

The preferred alternatives specify the Council's risk tolerance for overfishing which can not exceed, by law, 50 percent and work in conjunction with other provisions to address scientific and management uncertainty that are designed to avoid overfishing. The preferred alternatives are consistent with all Council FMP objectives and the MSA National Standards. The actions proposed through this amendment are largely administrative in nature and are not expected to have direct impacts on the prosecution of Council-managed fisheries, including landings levels, fishery distribution, or fishing methods and practices.

The preferred alternatives are expected to have a slight positive impact on the managed resources and non-target species caught in Council-managed fisheries. They are not expected to impact the status of the managed resources or to change the stock status of any non-target species compared to current conditions. Furthermore, since the preferred alternatives are not expected to impact fishing effort or fishing practices, they are also not expected to change the status of any protected species and they are not expected to cause substantial additional damage to physical habitat, beyond that caused by many fisheries which have operated in the affected environment for many years.

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

The preferred alternatives are not expected to alter the manner in which the fishing industry conducts fishing activities. Therefore, no changes in fishing behavior that would affect safety are anticipated. The preferred alternatives will not adversely impact public health or safety.

*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?*

It is not likely that the preferred alternatives would result in substantial impacts to unique areas. Many types of fishing occur in the impacted areas. The actions proposed through this framework are largely administrative in nature and are not expected to have impacts on the prosecution of the Council-managed fisheries, including landings levels, fishery distribution, or fishing methods and practices. Therefore, the preferred alternatives are not expected to result in a change to the spatial and/or temporal scope of fishing effort. Although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid interactions between fishing gear and physical structures due to the potential loss or entanglement of fishing gear.

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

The impacts of the proposed measures on the human environment are described in section 7. This action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. The current risk policy was implemented in 2011 in order to comply with the 2006 reauthorization of MSA. Because these measures are not novel and are all modeled after successfully implemented actions, the scientific basis for the measures contained in 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?*

The impacts of the preferred alternatives on the human environment are described in section 7. The preferred alternatives are not expected to alter fishing methods or activities or to change fishing effort or the spatial and/or temporal distribution of current fishing effort. The impacts to target, non-target, and protected species, as well as to habitats and human communities, will continue to be monitored. The preferred alternatives are not expected to have highly uncertain effects or to involve unique or unknown risks on the human environment.

*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?*

This action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. The current risk policy has been in place since 2011. The administrative measures associated with this action are consistent with those in place in other federal marine fisheries; they are not novel or unique. None of the preferred alternatives results in significant effects, nor do they represent a decision in principle about a future consideration. The impact of any future changes will be analyzed as to their significance in the process of developing and implementing them.

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

As discussed in section 7.3.4, the proposed action is not expected to have individually insignificant, but cumulatively significant impacts. The preferred alternatives, together with past, present, and reasonably foreseeable future actions, 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 impacts of the proposed measures on the human environment are described in section 7. This action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. The preferred alternatives are not expected to alter fishing methods or activities or to change fishing effort or the spatial and/or temporal distribution of current fishing effort. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels try to avoid fishing interactions between fishing gear and physical structures, including shipwrecks, due to possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternatives would adversely affect the historic resources listed above.

*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 adversely affect ESA listed, threatened, or endangered, marine mammals, or critical habitat of these species (section 6.4). The action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. These measures would not impose or result in any changes to fishing operations, fishing behavior, fishing gears used, or areas fished. As such, the impacts of the alternatives on any species that may be affected by the measures are wholly administrative in nature; there are no expected significant impacts on ESA proposed, threatened, or endangered species associated with the alternatives (section 7.0).

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

The action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. None of the proposed measures is expected to alter fishing methods or activities such that they threaten a violation of federal, State, or local law or requirements imposed for the protection of the environment. In fact, the preferred measures have been found to be consistent with other applicable laws (sections 8.3-8.10).

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

As described in section 7, none of the proposed measures is expected to alter fishing methods or activities. Because of the administrative nature of this action, none of the proposed measures is expected to alter fishing methods or activities or is expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. This action is not expected to affect ESA-listed or MMPA protected species or critical habitat in any manner not considered in previous consultations on the fisheries.

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

The impacts of this action on managed fish species, including target and non-target species, are described in section 7.1. None of the proposed measures change existing catch limits and are not expected to alter fishing methods or activities. Future application of the new risk policy may result in changing catch limits but not substantially different than currently observed. Because of the administrative nature of this action, none of the proposed measures is expected to alter fishing methods or activities or is expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. As such, the proposed action are not expected to have any significant adverse impacts on managed target or non-target fish species.

*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 substantial damage to EFH as defined under the Magnuson-Stevens Act and identified in Council FMPs. In general, bottom-tending mobile gear, primarily otter trawls and hydraulic dredges, has the potential to adversely affect EFH for the species as detailed in section 6.3 of the document. However, as described in section 7, none of the proposed measures is expected to alter fishing methods or activities. Because of the administrative nature of this action, none of the proposed measures is expected to alter fishing methods or activities or is expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The proposed actions are expected to result in no impacts to habitat (sections 7.1.3 and 7.2.3).

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

The preferred alternatives are not expected to have significant impacts on the natural or physical environment, including vulnerable marine or coastal ecosystems. The preferred alternatives are not expected to alter fishing methods or activities or to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The areas fished for Council-managed fisheries have been fished for many years, and for a variety of species, and this action is not expected to change the locations of fishing activity. While some fishing takes place near the continental slope/shelf break where deep sea corals may be found in and around the submarine canyons, much of this area in the Mid-Atlantic is now protected by a prohibition on bottom-tending gear in the Frank R. Lautenberg Deep Sea Coral Protection Area (81 Federal Register 90246; December 14, 2016). A proposed rule to establish similar coral protections off New England published on January 2, 2020 (85 Federal Register 285).

The preferred alternatives are not expected to alter fishing patterns relative to this protected area or in any other manner that would lead to adverse impacts on deep sea coral or other vulnerable marine or coastal ecosystems.

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

The impacts of Council-managed fisheries on biodiversity and ecosystem functioning have not been assessed; however, the impacts to components of the ecosystem (e.g., non-target species, habitat, and protected species) have been considered. As described in section 7, this action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. These measures are administrative in nature and are not expected to alter fishing methods or activities. None of the proposed measures will change existing catch limits and is not expected to increase fishing effort. These expected levels of effort are not likely to negatively impact the stock status of non-target species (sections 7.1.1 and 7.1.2), they are not likely to cause additional habitat damage beyond that previously caused by a variety of fisheries (sections 7.1.2 and 7.2.2), and they are not expected to jeopardize any protected species (sections 7.1.3 and 7.2.3). They are, however, not expected to contribute to the recovery of any endangered or threatened species. For these reasons, the preferred alternatives are not expected to have a substantial impact on biodiversity and ecosystem function within the affected area.

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

This action will modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. This action is administrative in nature and there is no evidence or indication that these fisheries have ever resulted in the introduction or spread of nonindigenous species. None of the proposed measures is expected to alter fishing methods or activities. Therefore, it is highly unlikely that the proposed action would be expected to result in the introduction or spread of a non-indigenous species.

**DETERMINATION**

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for the Excessive Shares Amendment, it is hereby determined that these measures 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.

_______________________________________ ________________

*Regional Administrator for GARFO, NMFS, NOAA* *Date*

**8.3 Endangered Species Act**

Sections 6.3 and 7 should be referenced for an assessment of the impacts of the proposed action on ESA-listed and MMPA protected resources. None of the actions proposed in this document are expected to alter fishing methods or activities or is expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, this action is not expected to affect endangered or threatened species or critical habitat in any manner not considered in previous consultations on these fisheries.

**8.4 Marine Mammal Protection Act**

Sections 6.3 and 7 should be referenced for an assessment of the impacts of the proposed action on marine mammals protected under the MMPA. None of the actions proposed in this document are expected to alter fishing methods or activities or is expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort for Council-managed fisheries. Therefore, this action is not expected to affect marine mammals or critical habitat in any manner not considered in previous consultations on the fisheries.

**8.5 Coastal Zone Management Act**

The Coastal Zone Management Act of 1972, as amended, provides measures for ensuring productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. The Council will submit this document to NMFS. NMFS will determine whether the proposed actions are consistent to the maximum extent practicable with the coastal zone management programs for each state (Maine through North Carolina).

**8.6 Administrative Procedure Act**

Sections 551-553 of the Federal Administrative Procedure Act establish 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 notice and opportunity to comment before the agency promulgates new regulations.

The Administrative Procedure Act requires solicitation and review of public comments on actions taken in the development of an FMP and subsequent amendments and framework adjustments. There were many opportunities for public review, input, and access to the rulemaking process during the development of the proposed framework described in this document and during development of this document. This action was developed through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on development of the preferred alternatives during the following meetings:

- June 6, 2017 Council meeting in Norfolk, VA

- August 8, 2017 Council meeting in Philadelphia, PA
- December 11, 2017 Council meeting in Annapolis, MD
- October 2, 2018 Council meeting in Cape May, NJ
- December 10, 2018 Council meeting in Annapolis, MD
- August 14, 2019 Council meeting in Philadelphia, PA
- December 9, 2019 Council meeting in Annapolis, MD

The public will have further opportunity to comment on this document and the proposed management measures once NMFS publishes a request for comments notice in the *Federal Register*.

**8.7 Section 515 (Data Quality Act)**

***Utility of Information Product***

The proposed action would modify the Council's risk policy which specifies the Council's acceptable tolerance or level of risk for the managed resources and works in conjunction with the SSCs application of the ABC control rule to account for scientific uncertainty to determine an ABC for a specific stock. These changes will continue to prevent overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. This document includes a description of the alternatives considered, the preferred actions and rationale for selection, and any changes to the implementing regulations of the FMP. As such, this document enables the implementing agency (NMFS) to make a decision on implementation of annual specifications and this document serves as a supporting document for the proposed rule.

The preferred alternatives were developed consistent with the FMP, MSA, and other applicable laws. They were developed through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on management measures during a number of public meetings (section 8.6). The public will have further opportunity to comment on this action once NMFS publishes a request for comments notice in the Federal Register.

***Integrity of Information Product***

This information product meets the standards for integrity under the following types of documents: Other/Discussion (e.g. Confidentiality of Statistics of the MSA; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act).

***Objectivity of Information Product***

The category of information product that applies here is "Natural Resource Plans." Section 8 describes how this document was developed to be consistent with any applicable laws, including the MSA. The analyses used to develop the alternatives (i.e., policy choices) are based upon the best scientific information available. The most up to date information was used to develop the EA which evaluates the impacts of those alternatives (section 7). The specialists who worked with these core data sets and management strategy evaluation models are familiar with the most recent analytical techniques and are familiar with the available data and information relevant to Council-managed fisheries and economics.

The review process for this specifications document involves Council, NEFSC, GARFO, and NMFS headquarters. The NEFSC technical review is conducted by senior level scientists with specialties in fisheries ecology, population dynamics, biology, economics, and social anthropology. The Council review process involves public meetings at which affected stakeholders can comment on proposed management measures. Review by GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected resources, and applicable laws. Final approval of this document and clearance of the rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

### 8.8 Paperwork Reduction Act

The Paperwork Reduction Act concerns the collection of information. The intent of the Paperwork Reduction Act is to minimize the federal paperwork burden for individuals, small businesses, state and local governments, and other persons, as well as to maximize the usefulness of information collected by the federal government. There are no changes to the existing reporting requirements previously approved under any Council-managed FMP for vessel permits, dealer reporting, or vessel logbooks. This action does not contain a collection-of-information requirement for purposes of the Paperwork Reduction Act.

### 8.9 Relative to Federalism/Executive Order 13132

This document does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order (EO) 13132.

### 8.10 Regulatory Flexibility Act and Regulatory Impact Review

This section provides analysis to address the requirements of Executive Order 12866 (Regulatory Planning and Review) and the Regulatory Flexibility Act. These two mandates are addressed together as many of their requirements are duplicative. In addition, many of their requirements duplicate those of the MSA and/or NEPA; therefore, this section contains several references to previous sections of this document.

#### 8.10.1 Basis and Purpose of the Rule and Summary of the Preferred Alternatives

This action is taken under the authority of the MSA and regulations at 50 CFR part 648. Section 4.1 includes the NEPA purpose and need for this action. As described in more detail in section 5, the preferred alternatives would modify two components of the Council's risk policy which specifies the Council's risk tolerance to overfishing under different stock biomass conditions. Preferred Alternative 9A would modify the current risk policy by increasing the probability of overfishing to 49 percent under high stock biomass levels and under the maximum of 50 percent allowed by law. This approach seeks to prevent stocks from being overfished by reducing the probability of overfishing as stock size falls below $B_{MSY,}$ while also allowing for increased risk under high stock biomass conditions that exceed $B_{MSY}$. Preferred Alternative 2B would remove would remove the typical/atypical species designation from the current risk policy and would apply the same risk policy approach across all species, regardless of life-history, and not implement lower risk for species with an atypical life-history.

Additional non-preferred alternatives were also considered. All alternatives are described in detail in section 5. For the purposes of the Regulatory Flexibility Act, only the preferred alternatives and those non-preferred alternatives which would minimize negative impacts to small businesses are considered (section 8.10.4).

### 8.10.2 Regulatory Flexibility Act

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.

The Regulatory Flexibility Act emphasizes predicting significant adverse impacts on small entities as a group distinct from other entities, as well as consideration of alternatives that may minimize negative impacts to small entities, while still achieving the objective of the action (section 8.10.4). When an agency publishes a proposed rule, it must either, (1) certify that the action will not have a significant adverse impact on a substantial number of small entities, and support such a certification with a factual basis demonstrating this outcome, or (2) if such a certification cannot be supported by a factual basis, prepare and make available for public review an Initial Regulatory Flexibility Analysis that describes the impact of the proposed rule on small entities.

The sections below provide supporting analysis to assess whether the proposed regulations will have a “significant impact on a substantial number of small entities.”

#### 8.10.2.1 Description and Number of Entities to Which the Rule Applies

Because this action would modify part of the process by which the acceptable biological catch limit are applied to the managed resources fisheries, the small entities to which this action applies include all federally permitted fishing vessels for the managed resources operating in the Northeast Region. These vessels include both small regulated entities engaged in either commercial harvesting or a party/charter business activity. Private recreational anglers are not considered “entities” under the Regulatory Flexibility Act, thus economic impacts on private anglers are not considered here.

For Regulatory Flexibility Act purposes only, NMFS established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (50 CFR §200.2). A business primarily engaged in commercial fishing is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $11 million, for all its affiliated operations worldwide. A business primarily engaged in for-hire fishing is classified as small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $7.5 million.

In order to identify firms, vessel ownership data,[13] which have been added to the permit database, was used to identify all the individuals who own fishing vessels. With this information, vessels were grouped together according to common owners. The resulting groupings were then treated as a fishing business, for purposes of identifying small and large firms.

According to the ownership database, 1,462 affiliate firms landed one or more of the managed resources during the 2016-2018 period, with 1,451 of those business affiliates categorized as small business and 11 categorized as large business.[14] The three-year average (2016-2018) combined gross receipts (all species combined) for all small entities was $610,527,031 and the average managed resources receipts was $150,752,270; this indicates that managed resources revenues contributed approximately 25% of the total gross receipts for these small entities. The 11 firms that were categorized as large entities had combined gross receipts of $205,416,169 and average managed resources receipts of $33,923,296, as such, managed resources receipts as a proportion of gross receipts is 17%.

For the recreational fishery, 336 affiliate firms held a for-hire federal permit for one or more of the managed resources and also generated revenues from recreational fishing for these managed resources during 2016-2018.[15] All of those business affiliates are categorized as small businesses. It is not possible to derive what proportion of the overall revenues for these for-hire firms came from fishing activities for an individual species. Nevertheless, given the popularity of of the managed resources as recreational species in the Mid-Atlantic and New England, revenues generated from these managed resources are likely to be important for many of these firms at certain times of the year. The three-year average (2016-2018) combined gross receipts (all for-hire fishing activity combined) for these small entities (336 affiliates) was $47,731,512 ranging from less than $10,000 for 107 entities (lowest value $207) to over $1,000,000 for 8 entities (highest value $2.9 million).

#### 8.10.2.2 Economic Impacts on Regulated Communities

The actions proposed through this amendment are largely administrative in nature and are not expected to have impacts on the prosecution of Council-managed fisheries, including landings levels, fishery distribution, or fishing methods and practices. The proposed action is not expected to result in changes to the manner in which Council-managed commercial and recreational fisheries are prosecuted, or the commercial and for-hire industries operates. The alternatives are described in detail in section 5. The economic impacts of all alternatives are described in section 7.1.4 and 7.2.4.

No immediate direct economic impacts are expected from the actions proposed in this framework. However, the preferred alternatives proposed through this framework may have indirect positive impacts on Council-managed fisheries. The preferred alternatives propose to change the Council's risk policy to address two issues. The first is to continue to prevent

[13] Affiliate database for 2016-2018 was provided by the NMFS NEFSC Social Science Branch. This is the latest affiliate data set available for analysis.

[14] According to the affiliate data set, for the 2016-2018 period, 1,956 small entities and 12 large entities had one or more Northeast federal fishing permit for one or more of managed resources.

[15] For the 2016-2018 period, a total of 389 for-hire entities reported revenues for various species (all categorized as small).

overfishing and minimize risk of a stock declining to low levels, while, at the same time, provide for increased fishery yield and economic benefits across all stock biomass levels. The second is allow for increased risk under very high stock biomass conditions to provide for increased opportunities and access to a robust stock and provide for increased fishery yield and greater economic benefits. According to a summer flounder economic analysis, the preferred alternative 9A is expected to result in an annual increase in economic welfare of more than $7.2 million ($36 million over five years) to the summer flounder fisheries over the current risk policy (section 5.12).

### 8.10.3 Regulatory Impact Review

Executive Order 12866 requires a Regulatory Impact Review in order to enhance planning and coordination with respect to new and existing regulations. This Executive Order requires the Office of Management and Budget to review regulatory programs that are considered to be "significant."

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:

- Have an annual effect on the economy of $100 million or more,
- 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,
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency,
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof, or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

As shown in section 6.5, the total ex-vessel value of all Council-managed fisheries in 2018 totaled $180.5 million. As noted in section 7.0, the risk policy only applies to stocks where quantitative estimates of biomass and biomass reference points (i.e., $B_{MSY}$) have been established and would not apply to stocks lacking these quantitative estimates such as *Illex* squid, longfin squid, and blueline tilefish. Removal of these species from the total 2018 ex-vessel value of Council-managed fisheries results in a total ex-vessel value of $117.9 million. However, the proposed action does not change existing commercial quotas or recreational harvest limits for any Council-managed resource and is not expected to change the manner in which these fisheries are prosecuted. The preferred alternatives are expected to result in increased catch and greater economic welfare and result in positive socioeconomic impacts.

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. Making adjustments to the Council's risk policy was explicitly contemplated in previous actions so this is not precedent-setting or novel.

As such, the Proposed Action is not considered significant as defined by Executive Order 12866 given the application of the risk policy to Council-managed fisheries and the expected positive socioeconomic impacts, at least as defined for Executive Order 12866.

### 8.10.4 Analysis of Non-Preferred Alternatives

When considering the economic impacts of the alternatives under the Regulatory Flexibility Act and Executive Order 12866, consideration should also be given to those non-preferred alternatives which would result in higher net benefits or lower costs to small entities while still achieving the stated objective of the action.

As described in section 5.12 and 7.1.4, the constant or stepped risk policy alternatives (Alternatives 3A, 4A, and 5A) do result in greater short-term (next 5 years) catch and economic welfare when compared to the preferred alternative (Alternative 9A). However, these alternatives for certain species and under poor recruitment and natural mortality situations result in the probability of overfishing exceeding 50 percent, more than allowed by law. In addition, long-term catch (last 20 years of a 30 year projection) and economic welfare was nearly identical between the constant or stepped alternatives and the preferred alternative.

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## 10.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this document, the Council consulted with NMFS, the New England and South Atlantic Fishery Management Councils, USFWS, and the states of Maine through North Carolina through their membership on the Mid-Atlantic and New England Fishery Management Councils.

The advice of NMFS GARFO personnel was sought to ensure compliance with NMFS formatting requirements.

Copies of this document and other supporting documents are available from Dr. Christopher M. Moore, Executive Director, Mid-Atlantic Fishery Management Council, Suite 201, 800 North State Street, Dover, DE 19901, (302) 674-2331, http://www.mafmc.org/.