Specifications and Management Measures For:
Atlantic Mackerel (2015, Including River Herring and Shad Cap),
Illex Squid (2015-2017), Butterfish (2015-2017), and Longfin Squid (2015-2017)

Includes Environmental Assessment and
Initial Regulatory Flexibility Analysis

Prepared by the

Mid-Atlantic Fishery Management Council (Council) in collaboration with the

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1.0 EXECUTIVE SUMMARY & TABLE OF CONTENTS

The Mid-Atlantic Fishery Management Council (Council) made recommendations for specifications and management measures for the Atlantic **M**ackerel (referred to simply as "mackerel" hereafter), **S**quid (*Illex* and longfin), and **B**utterfish (collectively "MSB") fisheries at its June 2014 meeting and herein submits them to the National Marine Fisheries Service (NMFS). These specifications are for 2015 for mackerel and 2015-2017 for squid and butterfish. Specifications for mackerel, including the mackerel fishery's river herring and shad (RH/S) cap will be revisited in 2015 for future years.

This document explains the potential actions and examines the impacts expected from implementation of these potential actions. The recommendations are consistent with the recommendations of the Council's Scientific and Statistical Committee (SSC), which may be accessed at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2014 meeting summary). The SSC's acceptable biological catch (ABC) recommendations account for scientific uncertainty such that overfishing of managed stocks should be unlikely to occur. The preferred specifications described in this document also address management uncertainties and optimum yield considerations raised by the MSB Monitoring Committee (NMFS and Council staff) or otherwise brought to the Council's attention.

The proposed alternatives are expected to maintain positive benefits to the nation by maintaining the sustainability of the resources, achieving optimum yield, and should have no significant impacts on valued ecological components compared to the fishery as it was prosecuted under the 2014 specifications. Because none of the preferred alternatives are associated with significant impacts to the biological, social, economic, or physical environment, a "Finding of No Significant Impact" (FONSI) has been made and this document constitutes an Environmental Assessment (EA) to satisfy the impact analysis requirements of the National Environmental Policy Act (NEPA).

In this document, catch quantities are the "***specifications***", commonly referred to as quotas. The longfin squid specifications are also divided up into trimesters, referred to as "***trimester quotas***" in this document. "***Management measures***" refer to other potential fishery controls such as closure thresholds, trips limits, and gear restrictions, which generally support the specifications and ensure that the specifications are not exceeded. A summary of changes for each species follows.

Mackerel (Alternative Set 1 (1b Preferred) and Set 2 (2b Preferred))

In 2012 the Council recommended, and NMFS implemented, three year specifications for mackerel for 2013-2015. Based on the SSC's lowering of its 2015 ABC recommendation, the Council recommended a reduced mackerel ABC of 40,165 mt for 2015 (Alternative Set 1, 1b Preferred). After Canadian catch, management uncertainty, and discards are accounted for, this translates into a reduced commercial quota (called domestic annual harvest or DAH) of 20,872 mt and a reduced recreational catch target of 1,397 mt. Also, a river herring and shad (RH/S) cap on the mackerel fishery of initially 89 mt (potentially expandable to 155mt) was recommended, which would be a reduction from the 2014 RH/S cap of 236 mt (Alternative Set 2, 2b preferred). No changes to other mackerel measures are proposed, which are described at: http://www.nero.noaa.gov/regs/info.html. These measures were selected as preferred in order to avoid overfishing and achieve optimum yield.

Illex Squid (Alternative Set 3, 3a Preferred))

Based on advice from the Council's SSC, the Council recommended a level *Illex* ABC of 24,000 metric tons (mt) for 2015-2017. This is the same as was recommended in 2011 by the SSC for 2012-2014. After discards are accounted for, this translates into a commercial quota (called domestic annual harvest or DAH) of 22,915 mt (also the same as current). No changes to other *Illex* measures are proposed, which are described at: http://www.nero.noaa.gov/regs/info.html. These measures were selected as preferred in order to avoid overfishing and achieve optimum yield.

Butterfish (Alternative Set 4, 4b Preferred)

Based on advice from the Council's SSC, the Council recommended butterfish ABCs of 33,278 mt, 31,412 mt, and 30,922 mt for 2015, 2016, and 2017 respectively. After management uncertainty and potential discarding are accounted for, this translates into commercial quotas (called domestic annual harvests or DAH) of 22,530 mt (2015), 21,042 mt (2016), and 20,652 mt (2017). The Council also recommended a simplified quota monitoring system given the higher recommended catches. These specifications include the butterfish discard cap on the longfin squid fishery (no changes recommended), and account for possible discarding in a directed butterfish fishery or other fisheries as well. These measures were selected as preferred in order to avoid overfishing and achieve optimum yield.

Longfin Squid[1] (Alternative Set 5, 5a Preferred)

Based on advice from the Council's SSC, the Council recommended a level longfin squid ABC of 23,400 mt for 2015-2017. This is the same as was recommended in 2011 by the SSC for 2012-2014. After discards are accounted for, this translates into a commercial quota (called domestic annual harvest or DAH) of 22,445 mt (also the same as current). No changes to other longfin squid measures (including Trimester allocations) are proposed, which are described at: http://www.nero.noaa.gov/regs/info.html. These measures were selected as preferred in order to avoid overfishing and achieve optimum yield.

A qualitative summary of the expected impacts related to all of the no action/status quo and preferred alternatives is provided in Table 1 (next page). For this fishery management plan (FMP), the no action alternative is the status quo because the regulations provide that the existing regulations remain in place until new regulations are implemented.

1 For longfin squid there was a scientific name change from *Loligo pealeii* to *Doryteuthis (Amerigo) pealeii*. To avoid confusion, this document will utilize the common name "longfin squid" wherever possible, but this squid is often referred to as "*Loligo*" by interested parties.

Table 1. Expected impacts of no action/status quo and preferred specifications

Status Quo and Preferred Alternatives	Valued Ecosystem Components/Environmental Dimensions				
	Managed Resource	Non-target Species	Human Communi-ties	Protected Resources	Essential Fish Habitat
Alt 1a - Mackerel No Action/Status Quo - ABC = 80,000mt; U.S. ABC = 43,781mt; DAH = 33,821mt; Rec Target = 2,443mt	low -	low -	low +	low -	low -
Alt 1b - Mackerel Preferred - 2014 ABC = 40,165mt; U.S. ABC = 25,039mt; DAH = 20,872mt; Rec Target = 1,397mt	low +	low +	low -	low +	low +
Alt 2a - RH/S Cap No Action/Status Quo - 236mt	low +	low +	low -	low +	low +
Alt 2b - RH/S Cap Preferred; 2014 Two-Phase Cap 89mt/155mt	low +	low +	low -	low +	low +
Alt 3a - *Illex* Status Quo/No Action and Preferred 2015-2017; ABC = 24,000mt; DAH = 22,915mt	0	low -	+	low -	low -
Alt 4a - Butterfish No Action/Status Quo - ABC = 18,200mt; DAH = 3,200; Butterfish Cap = 3,884mt	0	low -	low +	low -	low -
Alt 4b - Butterfish Preferred - ABC (2015/2016/2017) = 33,278/31,412/30,922mt; DAH = 22,530/21,042/20,652mt; Butterfish Cap = 3,884mt	0	low -	+	low -	low -
Alt 5a - Longfin Status Quo/No Action and Preferred 2015-2017; ABC = 23,400mt; DAH = 22,445mt	0	low -	+	low -	low -

("+" signifies a positive impact, "-" a negative impact, and "0" a neutral/similar impact compared to the year before. “low” indicates a likely small impact. Impacts for non-preferred alternatives are discussed in Section 7)

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2.0 LIST OF ACRONYMS, ABBREVIATIONS, ETC.

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
ASMFC	Atlantic States Marine Fisheries Commission or Commission
ATGTRT	Atlantic Trawl Gear Take Reduction Team
B	Biomass
CFR	Code of Federal Regulations
CV	coefficient of variation
DAH	Domestic Annual Harvest
DAP	Domestic Annual Processing
DPS	Distinct Population Segment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	Fishing Mortality Rate
FMP	Fishery Management Plan
FR	Federal Register
GB	Georges Bank
GOM	Gulf of Maine
IOY	Initial Optimum Yield
M	Natural Mortality Rate
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act (as currently amended)
MSB	Atlantic Mackerel, Squid, Butterfish
MSY	Maximum Sustainable Yield
MT (or mt)	Metric Tons (1 mt equals about 2,204.62 pounds)
NE	Northeast
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Level
PBR	Potential Biological Removal
RH/S	River herrings (blueback and alewife) and shads (American shad and hickory shad)
RSA	Research Set-Aside
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SNE	Southern New England
SSC	Scientific and Statistical Committee
TALFF	Total allowable level of foreign fishing
TRAC	Transboundary Resource Assessment Committee
US	United States
VTR	Vessel Trip Report

Note: "Mackerel" refers to "Atlantic mackerel" unless otherwise noted.

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4.0 THE ANNUAL SPECIFICATION PROCESS

4.1 Introduction

The Council manages the mackerel, squid, and butterfish (MSB) fisheries with the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP), pursuant to the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA) as currently amended. The MSB FMP requires the Council to set annual specifications according to national standards specified in the MSA and has the following objectives: Enhance the probability of successful recruitment; Promote the growth of the commercial fishery; provide freedom and flexibility to all harvesters; provide marine recreational fishing opportunities; increase understanding of the conditions of the stocks and fisheries; and minimize harvesting conflicts. Related to these objectives, the Council has instituted a variety of management changes over the years in addition to annual specifications, which are summarized at http://www.mafmc.org/msb/.

These specifications are for 2015 for mackerel (and its river herring/shad cap) and for 2015-2017 for squid and butterfish. Specifications for mackerel, including the mackerel fishery's river herring and shad (RH/S) cap will be revisited in 2015 for future years.

The specifications process this year began with recommendations from the Council's Scientific and Statistical Committee (SSC) for acceptable biological catches (ABC) that account for scientific uncertainty regarding stock status and productivity such that overfishing is unlikely. Annual catch limits are set equal to the ABCs, and if annual catch limits are exceeded paybacks will be required for mackerel and butterfish. The squids are exempted from paybacks due to their short lifecycle, but existing management measures are still designed to avoid overages - see http://www.nero.noaa.gov/regs/info.html for a summary of existing regulations by fishery. To avoid ABC overages for mackerel and butterfish, the Council recommends annual catch targets (ACTs) that provide a buffer for management uncertainties and other considerations (e.g. optimum yield) not otherwise addressed. Proactive accountability measures (like in-season closures and closure buffers) help ensure that catch targets are not substantially exceeded for mackerel and butterfish, and that the ABCs are not exceeded for longfin squid and *Illex* squid. The Council recommended that up to 3% of all four species may be set-aside to fund research projects (research set-asides or RSA), but the RSA program has been suspended so it is unlikely that any RSA quota will be utilized..

The Council's SSC met May 7-8, 2014 in Baltimore, MD and recommended the ABCs for MSB species. The MSB Monitoring Committee met on May 13, 2014 and May 27 2014 to review the SSC's ABC recommendations and consider recommending additional measures to account for management uncertainty and other operational issues. The Council considered the SSC's and Monitoring Committee's recommendations, Council staff input, as well as public comments and testimony for specifications for all four species at its June 2014 meeting in Freehold, NJ. Both the SSC and the Council also considered input from the Council's MSB Advisory Panel in the form of fishery-performance reports constructed by the Advisory Panel (see May 2014 meeting materials at: http://www.mafmc.org/ssc-meeting-documents/). The Council also considered input from its new RH/S Advisory Panel for the RH/S Cap.

This document serves as the submission to NMFS of the Council's recommendations for MSB specifications and management measures, and contains related analyses supporting the recommendations. The analysis of the proposed measures' environmental impacts (and their significance) is discussed in accordance with the National Environmental Policy Act (NEPA) and National Oceanic and Atmospheric Administration Order 216-6 formatting requirements for an Environmental Assessment. The proposed alternatives are expected to produce positive benefits to the nation by maintaining the sustainability of the resources and should have no significant impacts on valued ecological components compared to the fishery as it was prosecuted under the 2014 specifications. Because none of the preferred alternatives are associated with significant impacts to the biological, social or economic, or physical environment, a "Finding of No Significant Impact" (FONSI) has been made and this document constitutes an Environmental Assessment (EA) to satisfy the impact analysis requirements of NEPA.

4.2 Purpose and Need of the Action

The purpose of this action is to set specifications for the MSB fisheries, including the butterfish cap for the longfin squid fishery and the RH/S cap for the mackerel fishery. This action is needed to prevent overfishing and achieve optimum yield in the MSB fisheries, while controlling discards (bycatch) of butterfish and the incidental (non-target) catch of RH/S. Per the MSA, optimum yield is defined as the amount of fish that will provide the greatest overall benefit to the nation based on the maximum sustainable yield as reduced by relevant economic, social, and/or ecological factors. The MSA also requires that bycatch be minimized to the extent practicable and provides authority to conserve non-target species.

5.0 WHAT ALTERNATIVES ARE CONSIDERED IN THIS DOCUMENT?

Introduction

The no action alternative is equivalent to the current (“status quo”) specifications because the current regulations contain a "roll-over" provision. This provision specifies that if NMFS fails to publish annual specifications before the start of the new fishing year, then the previous year’s specifications remain in effect. The preferred alternatives were recommended by the Council after considering the recommendations of its SSC, recommendations from the MSB Monitoring Committee (Council and NMFS technical staff), input from the MSB Advisory Panel, input from the RH/S Advisory Panel, and public testimony and comment given the requirements of the MSA and the MSB FMP. Several alternatives are analyzed for each species to facilitate consideration of a reasonable range of alternatives (per NEPA) and their impacts on the stocks and other valued ecosystem components, including socio-economic impacts on fishing communities. While the alternatives generally provide for up to 3% of the harvest to be set aside for Research Set Aside (RSA) awards, the Council has suspended the RSA program so it is very unlikely that any RSA would actually be awarded.

5.1 Alternative Set 1: Mackerel Specifications

The general goal of the mackerel specifications is to account for all mackerel catch such that the ABC provided by the SSC is not exceeded and optimum yield is achieved. The ABC recommended by the SSC is 40,165 mt for 2015 (see May 2014 Meeting Summary at http://www.mafmc.org/ssc for details). The SSC will revisit mackerel specifications for 2016 in May 2015. Like recent years and for all alternatives, the quota available to Joint Venture Processing is zero and the quota available for foreign fishing (the total allowable level of foreign fishing or TALFF), is also zero since the U.S. fishery has the capacity to fully harvest the quota (as shown in Amendment 11's capacity analyses) if mackerel are available.

5.1.a Alternative 1a – No Action is the Status-Quo due to roll-over provisions

Alternative 1a represents the specifications that are in effect for 2014. While these specifications were originally set for 2013-2015, the SSC decided that a new ABC, as described in Alternative 1b, is more appropriate due to concerns about the status of the mackerel stock. Under the no action, the 80,000 ABC is apportioned between the U.S. and Canada and then between commercial and recreational allocations per the table below. The 2013 specifications final rule and associated environmental assessment, available at http://www.nero.noaa.gov/regs/2013/January/23_final_rule__atlantic_mackerel__squid__and_butterfish_fisheries__2013_specifications_and_management_measures.html can be consulted for additional details on the current specifications and their rationale, but the primary basis was a recommendation from a failed 2010 mackerel assessment (TRAC 2010) to limit catch to recent catch, which averaged 80,000 mt (2008-2010) at the time of the assessment. Other than a different ABC starting point these specifications are very similar in form to the preferred specifications (see Alternative 1b below), which also provide additional detail on the steps that generate the various specifications. Up to 3% of the ACT may be used for Research Set Aside (RSA) awards to fund research projects.

Table 2. Summary of No Action Mackerel Specifications – 1a

Alternative 1a for Mackerel - No action/status quo (all numbers are in metric tons)	
Specification	Mackerel
Overfishing Limit (OFL)	Unknown
Total Acceptable Biological Catch (ABC) from SSC	80,000
U.S. ABC = Annual Catch Limit (ACL) (Canadian catch deducted)	43,781
Recreational Allocation (6.2% of ACL)	2,714
Recreational Annual Catch Target (10% less than allocation to account for management uncertainty)	2,443
Commercial Allocation (93.8% of ACL)	41,067
Commercial Annual Catch Target (15% less than allocation to account for management uncertainty)	34,907
Landings or "Domestic Annual Harvest" (3.11% less than Annual Catch Target to account for expected discards)	33,821

5.1.b Alternative 1b (Preferred) – Mackerel specifications based on long-term median.

Alternative 1b (see table below) is the preferred alternative. It is based on the SSC-recommended ABC of 40,165 mt, which is derived from long-term median mackerel catches (see May 2014 Meeting Summary at http://www.mafmc.org/ssc for details) and would be more protective of the mackerel stock than the existing specifications. Based on the SSC's lowering of its 2015 mackerel ABC recommendation, the Council also recommended a reduced mackerel ABC of 40,165 mt for 2015. The SSC and the Council will revisit mackerel specifications for 2016 next year. The specifications are very similar to the existing specifications except for the lower ABC used as a starting point. This alternative is preferred because it utilizes the SSC ABC recommendation, and conforms to the MSB FMP in terms of how Canadian catch should be accounted for and how specifications are set for the commercial and recreational fisheries (see table below).

To get the portion of the total ABC available for the U.S. ABC, the expected Canadian catch must be accounted for and deducted. The 2014 Canadian quota is 10,000 mt, and there are an approximate 5,000 mt in additional unreported Canadian mackerel landings (pers. com. Francois Gregoire, Canadian Department of Fisheries and Oceans). Using the 1.26% discard rate observed in recent U.S. fisheries from the last assessment, this would suggest that it would be appropriate to deduct 15,126 mt for expected Canadian catch (it appears unlikely that Canadian quotas will increase in the near future due to their pessimistic assessment results).

After Canadian catch, management uncertainty (10% buffer), and discards are accounted for, this translates into a reduced commercial landings quota (called domestic annual harvest or DAH) of 20,872 mt and a reduced recreational catch target of 1,397 mt. Compared to the existing specifications' 15% buffer for commercial management uncertainty, a 10% buffer is recommended for 2015 given the lack of any quota overages historically. Some buffering was still deemed warranted since mackerel is a high volume fishery and NMFS' ability to accurately close the mackerel fishery has not been tested recently due to low mackerel catches.

Up to 3% of the ACT may be used for Research Set Aside (RSA) awards to fund research projects. The existing other management measures (trip limits, fishery closure thresholds, etc.) may be found at: http://www.nero.noaa.gov/nero/regs/ under "Fisheries of the Northeastern United States" but no actions/changes are proposed related to those measures.

Table 3. Summary 1b Mackerel Specifications – New SSC Recommendation

Alternative 1b for Mackerel - Preferred for 2015 (all numbers are in metric tons)	
Specification	Mackerel
Overfishing Limit (OFL)	Unknown
Total Acceptable Biological Catch (ABC) from SSC	40,165
U.S. ABC = Annual Catch Limit (ACL) (Canadian catch deducted)	25,039
Recreational Allocation (6.2% of ACL)	1,552
Recreational Annual Catch Target (10% less than allocation to account for management uncertainty)	1,397
Commercial Allocation (93.8% of ACL)	23,487
Commercial Annual Catch Target (10% less than allocation to account for management uncertainty)	21,138
Landings or "Domestic Annual Harvest" (1.26% less than Annual Catch Target to account for expected discards)	20,872

5.1.c Alternative 1c – Specifications based on 1992-2001 average catch

Alternative 1c (see table below) is based on a Council-staff recommendation that was not selected by the SSC or the Council, but is included to construct a range of alternatives. It is based on average mackerel catches (U.S. plus Canada) from 1992-2001, a period when catch appeared relatively stable (see May 2014 Meeting Materials at http://www.mafmc.org/ssc for details). Other than starting from a different ABC compared to 1b, this alternative is otherwise very similar to 1b in terms of how the ABC is utilized (Canadian catch, commercial/recreational allocation, management uncertainty buffers, discards, etc.). Up to 3% of the ACT may be used for Research Set Aside (RSA) awards to fund research projects.

Table 4. Summary 1c Mackerel Specifications – Staff Alternative

Alternative 1c for Mackerel (all numbers are in metric tons)	
Specification	Mackerel
Overfishing Limit (OFL)	Unknown
Total Acceptable Biological Catch (ABC) from SSC	33,400
U.S. ABC = Annual Catch Limit (ACL) (Canadian catch deducted)	18,274
Recreational Allocation (6.2% of ACL)	1,133
Recreational Annual Catch Target (10% less than allocation to account for management uncertainty)	1,020
Commercial Allocation (93.8% of ACL)	17,141
Commercial Annual Catch Target (10% less than allocation to account for management uncertainty)	15,427
Landings or "Domestic Annual Harvest" (1.26% less than Annual Catch Target to account for expected discards)	15,233

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5.2 Alternative Set 2: River Herring/Shad Cap for the Mackerel Fishery

These alternatives consider a range of river herring and shad catch (RH/S) caps for the mackerel fishery. The cap was selected by the Council in Amendment 14 to limit non-target RH/S catch (the MSA provides that measures may be developed to conserve non-target species). Amendment 14 indicated that the specifications would implement the specific cap values and other operational details.

The Amendment 14 EIS can be consulted for additional details on why the cap was selected (see: http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html), but the basic rationale was that many river herring and shad runs are in poor condition and the mackerel fishery may catch substantial amounts of RH/S in some years – the analysis described in Appendix 2 of Amendment 14 found that Mid-Atlantic mid-water trawl fishing in Quarter 1, which usually is largely but not completely comprised of mackerel fishing, might on average (2005-2010) be catching close to 168 mt or 2 million RH/S (mostly river herring) annually (using 5 fish per pound to convert weight to numbers of fish, per discussion with ASMFC staffer Kate Taylor). The cap was chosen as a way to directly limit RH/S catch while allowing fishermen the flexibility to figure out how to best avoid RH/S.

Amendment 14 and its Environmental Impact Statement considered the impacts of RH/S caps (biological and socioeconomic) on the mackerel fishery and other valued ecosystem components, and specified that the operational aspects of the cap would be set during the specifications process. Amendment 14:

- Specified the cap should be on RH/S in the mackerel fishery and would close the mackerel fishery to directed fishing once the cap is reached.
- Stated that specifications would be used to set the cap amount, the incidental trip limit, the cap trip definition, and the cap closure threshold.
- Specified that the cap would use a methodology similar to the butterfish cap except this cap is on all RH/S catch, not just discards since most RH/S are retained in the high-volume mackerel fishery. As such, trips with observers that retain more than 20,000 pounds of mackerel are used to determine the ratio of RH/S caught to all species retained on observed cap mackerel trips. For all trips that land more than 20,000 pounds of mackerel, the current RH/S ratio is applied to their combined total landings to generate a total RH/S catch estimate for all mackerel trips.
- While Amendment 14 specified that the actual cap amounts would be developed in the specifications process, it did explore some potential cap options for illustrative purposes. Amendment 14 considered caps for the mackerel fishery in the range of 85 mt -235 mt for river herring and 6 mt - 8 mt for shad.
- Amendment 14 also noted that whether or not the cap becomes constraining depends on the cap that is set, the RH/S encounter rates, and landings on mackerel trips. Using data from 2006-2010, Amendment 14 found that if a relatively high RH/S encounter rate occurs, mackerel landings could be limited to around 10,000 mt if the cap is set at the low end (near 91 mt). Lower encounter rates or higher caps were associated with less constraint, or no constraint at all for the mackerel fishery.

The following operational items were specified at the June 2013 Council meeting the first time the Council considered the RH/S cap:

- The Council decided on a combined cap for river herring and shad because the relatively small amount of shad caught by the mackerel fishery and the precision of those estimates would make monitoring a separate cap for shad infeasible
- The Council discussed which trips the cap would apply to in terms of identifying "mackerel trips" and selected trips landing over 20,000 pounds of mackerel because analysis of dealer landings/weighout data demonstrated that almost all mackerel 2004-2012 (98.5%) were landed by trips landing over 20,000 pounds of mackerel. Smaller trips (less than 20,000 pounds of mackerel) also had other species as the predominant species landed.
- The Council identified a post closure possession limit (20,000 pounds) to match the cap threshold of 20,000 pounds because of the same analysis.
- The Council decided on a closure threshold of when the cap catch is projected to be 95% of the cap because once the cap closes the fishery, additional trips that would count against the cap would not be expected. Using a projection should ensure a timely closure.

The above operational items were implemented for 2014 and no changes were considered necessary for 2015. The Council considered a variety of RH/S cap approaches for 2015 at its June 2014 meeting, per the following table. Three approaches (historical extrapolated RH/S catch, RH/S catch expanded to proposed 2015 mackerel quota, and RH/S catch expanded to the 2014 mackerel quota) were examined with three time series. The Council concluded that using historical extrapolated catch and/or RH/S catch expanded to proposed 2015 mackerel quota based on the same time period as last year were reasonable, and constructed a hybrid two-phase approach described below in Alternative 2b.

Table 5. RH/S Cap Approaches

	Actual Extrapolated RH/S Catch (mt)	Ratio expanded to new mackerel quota (RH/S mt)	Ratio expanded to 2014 mackerel quota (RH/S mt)
2005-2012 Medians (used last year)	89	155	252
2005-2013 Medians (includes new year)	81	132	214
2005-2010 Medians (no avoidance program)	101	126	204

Council and NMFS technical staffs continue to investigate how a regional cap spanning multiple fisheries might work, and such a cap could use the stratified estimation approach from Amendment 14 analyses. However, at this time for purposes of limiting one fishery, which is what the Council has the authority to do through Amendment 14, a ratio approach tied to mackerel trip definitions must be used, and this is how the values the above table were derived.

Alternative 2a – No Action is the Status-Quo due to roll-over provisions

Once cap trips are estimated to have caught 95% of a 236 mt RH/S cap, then the directed mackerel fishery would be closed and a 20,000 pound mackerel trip limit would be instituted. 236 mt was based on analysis of the estimated median amount of RH/S that would have been caught had the commercial mackerel fishery landed its 2014 quota of 33,821 mt over 2005-2012 given RH/S catch rates in those years. In some of those years the mackerel fishery landed more than 33,821 mt (2005 and 2006) but in most years the mackerel fishery landed less than 33,821 mt (2007-2012). By using 236 metric tons, the mackerel fishery could likely catch its full mackerel quota (33,821 mt) if it achieves a relatively low RH/S encounter rate (relative to 2005-2012), but would be shut down earlier if it does not. By restricting the mackerel fishery in years when high RH/S encounter rates occur, this quota would reduce RH/S catches in years of high encounter rates.

Alternative 2b (Preferred) – Two-phase 89 mt/155 mt river herring and shad cap

The Council recommended that the cap be set at 89 mt initially, but if mackerel landings surpass 10,000 mt then the cap would increase to 155 mt, as long as the initial cap had not been surpassed (i.e. once the cap closes the fishery it will stay closed for the remainder of the year). 89 mt is the median of extrapolated catch by vessels landing over 20,000 pounds of mackerel over 2005-2012. 155 mt is the median if the RH/S ratio from each year 2005-2012 is applied to the proposed 2015 mackerel landings quota (20,872 mt). The two-phase system was proposed by the Council so that the incentive for the mackerel fishery to avoid RH/S remains strong if mackerel catches are low or high. A 155 mt RH/S cap should allow the fishery to catch its proposed mackerel quota (20,872 mt) in 2015 if the ratio of RH/S catch to total catch is relatively low compared to 2005-2012 (based on observed trips that land greater than 20,000 pounds of mackerel). Thus once mackerel catches surpass 10,000 mt, as long as the relatively low RH/S catch ratio recorded to that point is maintained, then the fishery should be able to continue fishing up to the mackerel quota.

The Council was concerned that if mackerel catches are relatively low, then the incentive to avoid RH/S may be reduced because even if the ratio of RH/S catch is relatively high, with low mackerel landings the cap would still be calculated to be low. Thus the Council included the provision that the cap starts out lower, at 89 mt (the median of actual RH/S catches by the mackerel fishery 2005-2012) so that there is still a strong incentive to avoid RH/S catches even at low levels of mackerel catch.

Once cap trips were estimated to have caught 95% of then-in-effect RH/S cap (89 mt or 155 mt), then the directed mackerel fishery would be closed and a 20,000 pound mackerel trip limit would be instituted for the remainder of the year. This alternative is preferred because it creates a strong incentive for the fleet to avoid RH/S even at low levels of mackerel fishing, allows for the possibility of the full mackerel quota to be caught if the fleet can avoid RH/S, and would likely reduce RH/S catches over time compared to what would occur without a cap in place.

Alternative 2c – 155 MT metric tons (mt) river herring and shad cap

155 mt is the median RH/S catch if the RH/S ratio from each year 2005-2012 is applied to the proposed 2015 mackerel landings quota (20,872 mt). A 155 mt RH/S cap should allow the fishery to catch its proposed mackerel quota (20,872 mt) in 2015 if the ratio of RH/S catch to total catch is relatively low compared to 2005-2012 (based on observed trips that land greater than 20,000 pounds of mackerel). This alternative uses the same approach as the no action, but is just updated to reflect the proposed 2015 mackerel landings quota.

5.3 Alternative Set 3: Illex Specifications

The overall goal of the *Illex* squid specifications is to account for all catch such that the ABC provided by the SSC is not exceeded and optimum yield is achieved. The Omnibus Amendment does not apply to *Illex* squid because of *Illex's* short lifespan. Accordingly, the alternatives for *Illex* squid presented below do not include specifications for ACL and ACT, but the SSC still sets ABCs designed to avoid overfishing, and the Council implements management measures designed to ensure that the ABC is not exceeded. All alternatives consider setting new 3-year specifications. While on one hand setting specifications for 3 years for a species that lives less than a year may seem odd, the critical factor is that the primary information about the sustainability of the fishery comes from the SSC's finding that catches of 24,000 mt should be sustainable. Given it is unlikely that substantial new information on sustainable catch rates will be available next year, it is unlikely that any other specification will be found to be more appropriate. However, the SSC will review the fishery and if the SSC recommends a new ABC the Council would have to revisit these specifications. Setting 3-year specifications simply minimizes unnecessary paperwork if the SSC and Council decide not to propose any changes. No changes are proposed to other *Illex* measures, which have successfully avoided ABC overages in recent years and are described at: http://www.nero.noaa.gov/regs/info.html. The SSC has requested that a new *Illex* assessment be conducted before the next set of three year specifications are considered in May 2017. The assumed 4.52% for discards is the mean plus one standard deviation of the most recent 10 years of observed discard rates.

5.3.a Alternative 3a (Preferred) – New 3-year specifications (2015-2017) at same level as current, which also would be the "No Action" Alternative and is the Status-Quo due to roll-over provisions.

Alternative 3a (see table below) is the preferred alternative in addition to being the no-action alternative. It is preferred because it is based on the SSC-recommended ABC of 24,000, which is derived from observation of historical catch patterns (see May 2014 Meeting Summary at http://www.mafmc.org/ssc for details) and otherwise conforms to the MSB FMP. After discards are accounted for, this translates into a commercial quota (called domestic annual harvest or DAH) of 22,915 mt. Accordingly, 22,915 mt is the recommended initial optimum yield (IOY) and domestic annual processing (DAP) specification (it is expected that the U.S. fishery can harvest and process the entire quota if *Illex* are sufficiently available). The discard ratio comes from the most recent assessment (SAW-SARC 42; NEFSC 2005: http://www.nefsc.noaa.gov/publications/crd/crd0601/), which while not accepted by peer review still contained discard estimates. Up to 3% of the DAH may be used for Research Set Aside (RSA) awards to fund research projects.

Table 6. Preferred *Illex* Specifications 3a.

Alternative 3a for *Illex*		
(a)	Overfishing Limit (OFL) (metric tons - mt)	Unknown
(b)	Acceptable Biological Catch (ABC) (mt)	24,000
(c)	Commercial Discard Set-Aside	4.52%
(d)	Initial Optimum Yield (IOY)	22,915
(e)	Domestic Annual Harvest (DAH) (mt)	22,915
(f)	Domestic Annual Processing (DAP) (mt)	22,915

5.3.b Alternative 3b – ABC 25% higher than preferred

Alternative 3b (see table below) is 25% higher than 3a to create a range of alternatives but is otherwise identical to 3a. Up to 3% of the DAH may be used for Research Set Aside (RSA) awards to fund research projects.

Table 7. Summary 3b *Illex* Specifications – ABC 25% Higher.

Alternative 3b for *Illex*		
(a)	Overfishing Limit (OFL) (metric tons - mt)	Unknown
(b)	Acceptable Biological Catch (ABC) (mt)	30,000
(c)	Commercial Discard Set-Aside	4.52%
(d)	Initial Optimum Yield (IOY)	28,644
(e)	Domestic Annual Harvest (DAH) (mt)	28,644
(f)	Domestic Annual Processing (DAP) (mt)	28,644

**See Alternative 3a for additional explanation of the rows in the above table.

5.3.c Alternative 3c – ABC 25% lower than preferred

Alternative 3c (see table below) is 25% lower than 3a to create a range of alternatives but is otherwise identical to 3a. Up to 3% of the DAH may be used for Research Set Aside (RSA) awards to fund research projects.

Table 8. Summary 3c *Illex* Specifications – ABC 25% Lower.

Alternative 3c for *Illex*		
(a)	Overfishing Limit (OFL) (metric tons - mt)	Unknown
(b)	Acceptable Biological Catch (ABC) (mt)	18,000
(c)	Commercial Discard Set-Aside	4.52%
(d)	Initial Optimum Yield (IOY)	17,186
(e)	Domestic Annual Harvest (DAH) (mt)	17,186
(f)	Domestic Annual Processing (DAP) (mt)	17,186

**See Alternative 3a for additional explanation of the rows in the above table.

5.4 Alternative Set 4: Butterfish Specifications

The overall goal of the butterfish specifications is to account for all catch such that the ABC provided by the SSC is not exceeded and optimum yield is achieved. The SSC recommended ABCs of 33,278 mt, 31,412 mt, and 30,922 mt for 2015, 2016, and 2017 respectively (see May 2014 Meeting Summary at http://www.mafmc.org/ssc for details). For all butterfish alternatives, quota available to Joint Venture Processing is zero and quota available for foreign fishing, the total allowable level of foreign fishing (TALFF) is also zero since butterfish TALFF is only specified as a bycatch allowance if mackerel TALFF is specified, and no mackerel TALFF is specified. Also, no changes are proposed to current regulations that require use of 3-inch or greater mesh to possess greater than 2,500 pounds of butterfish (when landings greater than 2,500 pounds are allowed).

5.4.a Alternative 4a – No Action is the Status-Quo due to roll-over provisions

Alternative 4a (see table below) is the no-action alternative and the current 2014 specifications due to the roll-over provisions in the FMP. 9,100 mt was the ABC recommendation for 2014 by the SSC. Drs. Tim Miller, Charles Adams, and Paul Rago collaborated on the analysis used to justify this ABC as unlikely to lead to overfishing (Miller et al. (2013), and it is available at: http://www.mafmc.org/ssc-meetings/2013/april-may. The 10% deduction for management uncertainty used to arrive at the ACT is set by the Council to avoid ACL overages. These specifications also include that up to 2% of the ACT (164 mt) may be used to cover butterfish discarding related to longfin squid research set-aside fishing, and would be accounted for within the 1,106 mt unallocated portion of the ACT that covers butterfish discards in other fisheries.

Table 9. Summary of No Action Butterfish Specifications – 4a

Alternative 4a for Butterfish - No Action (all numbers are in metric tons)	
Specification	Butterfish
Overfishing Limit (OFL)	18,200
Total Acceptable Biological Catch (ABC) from SSC = ACL	9,100
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty)	8,190
Landings or "Domestic Annual Harvest (DAH)"	3,200
Butterfish Cap	3,884

The DAH would be utilized in a 3-Phase system that allows some directed fishing without trip limits initially (for vessels using 3-inch or greater mesh), and then implements a 5,000 pound trip limit for a time, and then implements a 600 pound trip limit as a backstop. Incidental permits have a 600 pound trip limit year-round. The amounts available in each phase change as the year progresses such that more quota is shifted to the less restricted phases as the year progresses since less of a backstop is required as there becomes less time until the beginning of the next year. The preferred allocations for the phases are listed in the table below. All other measures besides those contemplated in this action, and described at: http://www.nero.noaa.gov/regs/info.html, would remain the same.

Table 10. Butterfish Phases under 4a

Months	Phase 1 Available Landings	Phase 2 Available Landings	Phase 3 Available Landings	Total
Jan/Feb	1,658	463	1,079	3,200
Mar/Apr	1,838	437	925	3,200
May/Jun	2,044	411	745	3,200
Jul/Aug	2,249	386	565	3,200
Sep/Oct	2,455	360	386	3,200
Nov/Dec	2,635	334	231	3,200

5.4.b Alternative 4b (Preferred) – New 3-year butterfish specifications based on new assessment

Alternative 4b (see table below) is the preferred alternative because it is based on the SSC-recommended ABCs of 33,278 mt, 31,412 mt, and 30,922 mt for 2015, 2016, and 2017 respectively and should facilitate an orderly redevelopment of a directed butterfish fishery by avoiding ABC overages while allowing additional butterfish to be landed. The ABCs are based on projections from the recently accepted 2014 butterfish assessment (SAW-SARC 58; NEFSC 2014: http://nefsc.noaa.gov/publications/crd/crd1403/), which concluded that the stock was above the target stock size and experiencing low fishing mortality. The Council has since received confirmation from NMFS that the butterfish stock is considered fully rebuilt. For multi-year projections the SSC typically only specifies an OFL for the first year, but the ABCs are what drive the specifications.

Table 11. Preferred Butterfish Specifications 4b.

Alternative 4b for Butterfish - Preferred (all numbers are in metric tons)			
Specification	Butterfish 2015	Butterfish 2016	Butterfish 2017
Overfishing Limit (OFL)	41,092	NA	NA
Total Acceptable Biological Catch (ABC) from SSC = ACL	33,278	31,412	30,922
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty)	29,950	28,271	27,830
Landings or "Domestic Annual Harvest (DAH)" (66% less than Annual Catch Target to account for expected discards)	22,530	21,042	20,652
Butterfish Cap	3,884	3,884	3,884

The projections work in a stepwise fashion and assume average recruitment (fish entering the population). First they assume that 9,100 mt of butterfish was caught in 2014 (9,100 mt was the 2014 ABC). Then a fishing mortality rate is applied that should result in a 60% probability of not overfishing, which is 33,278 mt in 2015. Assuming that 33,278 mt is actually caught (i.e. removed from the population) in 2015, a fishing mortality rate is applied to the new stock to again generate a catch associated with a 60% probability of not overfishing, which is 31,412 mt in 2016. Repeating the process again results in a 2017 ABC of 30,922 mt. Since the stock is estimated to be above its target, catches fall slightly over time, but as long as the stock remains at or above its target, ABCs would not be expected to fall below 29,000 mt (if the same approach to addressing scientific uncertainty is used and average recruitment occurs). Up to 3% of the ACT may be used for Research Set Aside (RSA) awards to fund research projects.

The Council requires that a 60% probability of not overfishing be used for re-built stocks with a typical life history. While there was consideration of requiring a higher probability of not overfishing due to butterfish's role as forage, since the overfishing level itself is designed for forage stocks, the SSC determined that applying the 60% requirement was appropriate (i.e. forage issues are incorporated directly into the overfishing level determination and ABC calculations). The overfishing level follows published guidance for forage/small pelagic species of keeping to an F:M (fishing mortality to natural mortality) ratio of 67% (Patterson 2002, Lenfest 2012), which equals 0.81. Requiring a 60% probability of not overfishing translates into a 19% buffer from the overfishing threshold given the uncertainty parameters used by the SSC (100% coefficient of variation on the OFL estimate). See the May 2014 Meeting Report at http://www.mafmc.org/ssc for additional details. Since the fleet is unlikely to catch 9,100 mt in 2014 or the ABCs specified in each subsequent year (due to additional management buffers and a likely gradual ramping up of the fishery), the actual probability of not overfishing will likely be higher than the required/calculated 60%, since more fish will be left in the water in each year than was assumed by the modeled projections.

The Council recommends setting aside 10% of the ABC as a buffer against management uncertainty, leaving 29,950 mt, 28,271 mt, and 27,830 mt as annual catch targets (ACTs) for 2015, 2016, and 2017. After butterfish discards in a) the longfin squid fishery (3,884 mt), b) miscellaneous other fisheries (637 mt) and c) a potential redeveloped butterfish fishery (assuming a 11.4% discard rate) are accounted for, this leaves landings of 22,530 mt, 21,042 mt, and 20,652 mt available for a directed fishery in the form of domestic annual harvest (DAH). 3,884 mt is the current butterfish cap, and the longfin squid fishery has been able to operate under this cap in recent years. 637 mt is the highest estimated amount of butterfish discards in non-longfin cap fisheries for 2011-2013 as monitored by NMFS. Butterfish quota details are also described in the table on the next page. While discards are generally estimated by NMFS at the area/gear-type level, analysis in Section 6.5 illustrates that butterfish are discarded in the mackerel and *Illex* fisheries to a degree. Also, vessels that are fishing for longfin squid but land less than 2,500 pounds of longfin squid would not count against the cap likely have some butterfish discards at times. The 637 mt reserved for these kinds of discards ensures that all butterfish fishing mortality is accounted for.

The 11.4% discard rate was the subject of considerable discussion by the Council. There are unfortunately no recent observer data from trips with substantial butterfish landings. There were only 16 trips in the observer database retaining more than 10,000 pounds of butterfish. These trips had a combined butterfish discard rate of 21.7%, but were from 1989-2000 and there is concern that the fishery has changed since then. There was also concern that trips of 10,000 pounds to 25,000 pounds are unlikely to reflect directed fishing accurately- in 2001, the last year of substantial directed butterfish fishing, it only took the 12 largest trips by just two vessels to catch 2,571 mt (an average of 214 mt or almost 500,000 pounds per trip). Five of the above 16 observed trips retained more than 25,000 pounds of butterfish, and their discard rate was 11.4%.

2013 and 2014 vessel trip report (VTR) data available in June of 2014 suggested a butterfish discard rate around 3%-5% for butterfish trips greater than 10,000 pounds (25 total), but there is often concern about using the self-reported vessel trip report data for discard information. The Council also received public comments at the meeting that processors had found uses for most sizes of butterfish and that on directed butterfish trips, discarding should be relatively low. Given the available information, the Council decided that the 11.4% value was most reasonable, since the larger observer trips would better characterize a directed fishery, and it represented a middle ground between the combined old observer trips and the newer vessel trip report data.

Also, since the butterfish cap restricts discards in the longfin squid fishery, there should not be a substantial source of other underestimated catch. With the 10% buffer between the ACT and ABC/ACL (slightly more than 3,000 mt each year), this should mean that ABC/ACL overages would not occur even if discarding is double the 11.4% assumed rate. An 11.4% assumed rate translates into approximately 2,700 mt -2,900 mt each year, so even if double this amount of discards occurs, it could be absorbed by the 3,000+ mt ACT buffer (see table below), so no ABC overage would occur.

Table 12. Butterfish Quota Details Under Preferred Alternative

	2015	2016	2017	
ABC (mt)	33,278	31,412	30,922	
ACT Buffer (mt)	3,328	3,141	3,092	
ACT Buffer %	10.0%	10.0%	10.0%	
ACT (mt)	29,950	28,271	27,830	
Landings or "DAH" (mt)	22,530	21,042	20,652	
Assumed discards in butterfish fishing (11.4%) (mt)	2,899	2,707	2,657	These amounts total to the ACT
Assumed other discards (highest from 3 cap years) (mt)	637	637	637	
Butterfish Cap (longfin discards) (mt)	3,884	3,884	3,884	
Close primary directed at this amount (mt), i.e. with 1,411 mt left; then go to 5,000 pound trip limit	21,119	19,631	19,241	

Given the higher landings quota, a simplified closure mechanism is recommended, whereby once landings are projected to reach within 1,411 mt of the annual DAH, then a 5,000 pound trip limit would be implemented (see last row in above table). Recent fishery performance (weekly landing rates in 2013-2014) suggests that it is unlikely that more than 1,411 mt will be landed after a trip limit of 5,000 is implemented. If all of the DAH is projected to have been landed then a 600 pound trip limit would be implemented to minimize any DAH overage. However, reserving 1,411 mt for after a 5,000 pound trip limit is instituted should avoid any overage based on 2013-2014 landing rates.

5.4.c Alternative 4c – Stepped increases

Alternative 4c (see table below) is based on the SSC-recommended ABCs and general management approach of 4b above for 2017, but per public comments and a motion that failed at the June 2014 Council meeting, 4c would increase the DAH in approximately thirds over 2015-2017 relative to the no action DAH and the preferred 2017 DAH. Alternative 4c is thus equivalent to 4b in 2017 but uses reduced ABCs in years 2015 and 2016 to create a stepped increase in landings. Ultimately, the Council decided that there were neither additional unconsidered major sources of scientific uncertainty nor market/management issues to justify not fully utilizing the acceptable biological catches suggested by the recently accepted butterfish assessment (and endorsed by the SSC).

In this alternative, the cap for the longfin squid fishery and assumptions about discards remain the same as 4b (3,884 mt for longfin squid/butterfish cap, 637 mt for miscellaneous other discards, and 11.4% for discarding in a resumed directed butterfish fishery). The rationales for these allotments are described in 4b. Up to 3% of the ACT may be used for Research Set Aside (RSA) awards to fund research projects.

Table 13. Summary Butterfish Specifications – Stepped Increase – 4c

Alternative 4c for Butterfish - Stepped Increase to Landings (all numbers are in metric tons)			
Specification	Butterfish 2015	Butterfish 2016	Butterfish 2017
Overfishing Limit (OFL)	41,092	NA	NA
Total Acceptable Biological Catch (ABC) from SSC = ACL	16,332	23,627	30,922
Commercial Annual Catch Target (10% less than ACL to account/buffer for management uncertainty in 2017, reflects a stepped increase in 2015-2016)	14,699	21,264	27,830
Landings or "Domestic Annual Harvest (DAH)" (66% less than Annual Catch Target to account for expected discards)	9,017	14,835	20,652
Butterfish Cap	3,884	3,884	3,884

Given the higher landings quota, a simplified closure mechanism is recommended, whereby once landings are projected to reach within 1,411 mt of the annual DAH, then a 5,000 pound trip limit would be implemented. If the DAH is projected to have been landed then a 600 pound trip limit would be implemented to minimize any DAH overage, but recent fishery performance suggests that it is unlikely that more than 1,411 mt will be landed after a trip limit of 5,000 is implemented (see 4b for additional details).

5.5 Alternative Set 5: Longfin Squid Specifications

The overall goal of the longfin squid specifications is to account for all catch such that the ABC provided by the SSC is not exceeded and optimum yield is achieved. The Omnibus Amendment does not apply to longfin squid because of longfin squid's short lifespan. Accordingly, the alternatives for longfin squid presented below do not include specifications for ACL and ACT, but the SSC still sets ABCs designed to avoid overfishing, and the Council implements management measures designed to ensure that the ABC is not exceeded. All alternatives consider setting new 3-year specifications. While on one hand setting specifications for 3 years for a species that lives less than a year may seem odd, the critical factor is that the primary information about the sustainability of the fishery comes from a longfin squid assessment and SSC evaluation that strongly suggests catches of 23,400 mt should be sustainable. The most recent longfin squid assessment concluded that potentially exploitation rates could be increased, but it was impossible to determine by how much (NEFSC 2011; SAW-SARC 51: http://www.nefsc.noaa.gov/publications/crd/crd1101/). Given it is unlikely that substantial new information on sustainable catch rates will be available next year, it is unlikely that any other specification will appear more appropriate. However, the SSC will review the fishery and if the SSC recommends a new ABC the Council would have to revisit the longfin squid specifications. Setting 3 year specifications just minimizes unnecessary paperwork if the SSC and Council decide not to propose any changes. No changes are proposed to the trimester allocations (Trimester 1: 43%; Trimester 2: 17%; Trimester 3:40%) or other management measures (e.g. trimester quota rollover, closure mechanisms, incidental trip limits), which are described at: http://www.nero.noaa.gov/regs/info.html. The assumed 4.08% for discards is the mean plus one standard deviation of the most recent 10 years of observed discard rates.

5.5.a Alternative 5a (Preferred) – New 3-year specifications (2015-2017) at same level as current, which also would be the "No Action" Alternative and is the Status-Quo due to roll-over provisions

Alternative 5a (see table below) is the preferred alternative in addition to being the no-action alternative. It is preferred because it is based on the SSC-recommended ABC of 23,400, which is based on information from the most recent assessment (see May 2014 Meeting Summary at http://www.mafmc.org/ssc for details), and otherwise conforms to the MSB FMP. After discards are accounted for, this translates into a commercial quota (called domestic annual harvest or DAH) of 22,445 mt. The discard ratio comes from the most recent assessment. Accordingly, 22,445 mt is the recommended initial optimum yield (IOY) and domestic annual processing (DAP) specification (it is expected that the U.S. fishery can harvest and process the entire quota if longfin squid are sufficiently available). Up to 3% of the DAH may be used for Research Set Aside (RSA) awards to fund research projects.

Table 14. Summary of Preferred Longfin Squid Specifications 5a

Alternative 5a for *Longfin Squid*		
(a)	Overfishing Limit (OFL) (metric tons - mt)	Unknown
(b)	Acceptable Biological Catch (ABC) (mt)	23,400
(c)	Commercial Discard Set-Aside	4.08%
(d)	Initial Optimum Yield (IOY)	22,445
(e)	Domestic Annual Harvest (DAH) (mt)	22,445
(f)	Domestic Annual Processing (DAP) (mt)	22,445

5.5.b Alternative 5b – ABC 25% higher than preferred

Alternative 5b (see table below) is 25% higher than 5a to create a range of alternatives but is otherwise identical to 5a. Up to 3% of the DAH may be used for Research Set Aside (RSA) awards to fund research projects.

Table 15. Summary Longfin Squid Specifications – ABC 25% Higher.

Alternative 5b for Longfin Squid		
(a)	Overfishing Limit (OFL) (metric tons - mt)	Unknown
(b)	Acceptable Biological Catch (ABC) (mt)	29,250
(c)	Commercial Discard Set-Aside	4.08%
(d)	Initial Optimum Yield (IOY)	28,057
(e)	Domestic Annual Harvest (DAH) (mt)	28,057
(f)	Domestic Annual Processing (DAP) (mt)	28,057

**See Alternative 5a for additional explanation of the rows in the above table.

5.5.c Alternative 5c – ABC 25% lower than preferred

Alternative 5c (see table below) is 25% lower than 5a to create a range of alternatives but is otherwise identical to 5a. Up to 3% of the DAH may be used for Research Set Aside (RSA) awards to fund research projects.

Table 16. Summary Longfin Squid Specifications – ABC 25% Lower.

Alternative 5c for Longfin Squid		
(a)	Overfishing Limit (OFL) (metric tons - mt)	Unknown
(b)	Acceptable Biological Catch (ABC) (mt)	17,550
(c)	Commercial Discard Set-Aside	4.08%
(d)	Initial Optimum Yield (IOY)	16,834
(e)	Domestic Annual Harvest (DAH) (mt)	16,834
(f)	Domestic Annual Processing (DAP) (mt)	16,834

**See Alternative 5a for additional explanation of the rows in the above table.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

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

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

Overviews of the managed species and of the physical environment are described first, to establish the context for the valued ecosystem components. Impacts of the alternatives on the physical environment are addressed through analysis of impacts on habitat, as most of the impacted physical environment comprises EFH for various species.

6.1 Description of the Managed Resources

Mackerel

Atlantic mackerel is a semi-pelagic/semi-demersal (may be found near the bottom or higher in the water column) schooling fish species primarily distributed between Labrador (Newfoundland, Canada) and North Carolina. Additional life history information is detailed in the Essential Fish Habitat (EFH) document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of Atlantic mackerel is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. Recent results from the NEFSC Spring Trawl survey (the spring survey catches the most mackerel) are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2014 Meeting Materials).

Butterfish

Atlantic butterfish is a semi-pelagic/semi-demersal schooling fish species primarily distributed between Nova Scotia, Canada and Florida. Additional life history information is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of butterfish is not overfished (above target biomass) with no overfishing occurring according to a recently accepted assessment (NEFSC 2014). The assessment is available at: http://nefsc.noaa.gov/publications/crd/crd1403/.

Longfin Squid

Longfin squid is a semi-pelagic/semi-demersal schooling cephalopod species primarily distributed between Georges Bank and Cape Hatteras, NC. Additional life history information is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Based on a new biomass reference point from a 2010 SAW-SARC assessment, the longfin squid stock was not overfished in 2009, but overfishing status was not determined because no overfishing threshold was recommended (though the assessment did describe the stock as "lightly exploited'). The assessment documents are available at: http://www.nefsc.noaa.gov/saw/reports.html. Recent results from the NEFSC Trawl surveys are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2014 Meeting Materials).

Illex Squid

Illex squid is a semi-pelagic/semi-demersal schooling cephalopod species distributed between Newfoundland and the Florida Straits. Additional life history information is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The status of *Illex* is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. Recent results from the NEFSC Trawl surveys are highly variable, and are graphed in the "NEFSC Biological Update" that is created as part of the SSC ABC-setting process. These are available at: http://www.mafmc.org/ssc-meeting-documents/ (see May 2014 Meeting Materials).

6.2 Physical Environment

Climate, physiographic, and hydrographic differences separate the Atlantic Ocean from Maine to Florida into two distinct areas, the New England-Middle Atlantic Area and the South Atlantic Area, with the natural division occurring at Cape Hatteras, though the division is better thought of as a mixing zone rather than as a definitive boundary. The MSB fisheries are prosecuted in the New England-Middle Atlantic Area. The inshore New England-Middle Atlantic area is fairly uniform physically and is influenced by many large coastal rivers and estuarine areas. The continental shelf

(characterized by water less than 650 ft. in depth) extends seaward approximately 120 miles off Cape Cod, narrows gradually to 70 miles off New Jersey, and is 20 miles wide at Cape Hatteras. Surface circulation is generally southwesterly on the continental shelf during all seasons of the year, although this may be interrupted by coastal indrafting and some reversal of flow at the northern and southern extremities of the area. Water temperatures range from less than 33 ^{o}F from the New York Bight north in the winter to over 80 ^{o}F off Cape Hatteras in summer.

Within the New England-Middle Atlantic Area, the principal area within which the MSB fisheries are prosecuted is the Northeast Shelf Ecosystem which includes the area from the Gulf of Maine to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. A number of distinct subsystems comprise the region. The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with 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 fast-moving currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. Detailed information on the affected physical and biological environments inhabited by the managed resources is available in Stevenson et al. (2006).

Ecosystem Considerations

The Mid-Atlantic Fishery Management Council (Council) has engaged its SSC to help the Council:

-Develop ecosystem level goals, objectives, and policies;

-Incorporate ecosystem structure and function in FMPs to account for ecological sustainability;

-Anticipate and/or respond to shifts in ecological conditions and/or processes; and

-Consider evolving current FMPs into regional ecosystem-based plans.

The Council is currently developing ecosystem policies with its SSC. In the meantime, this section provides background on the broad ecosystem in which the Atlantic Mackerel, Squid, and Butterfish fisheries generally take place. This section is generally adapted from the "Ecosystem Status Report for the Northeast U.S. Continental Shelf Large Marine Ecosystem" (Ecosystem Assessment Program 2011 - http://www.nefsc.noaa.gov/publications/crd/crd1207/crd1207.pdf). The Council's SSC may also take ecosystem factors into account when setting ABCs.

The Northeast U.S. Continental Shelf Large Marine Ecosystem is a dynamic, highly productive, and intensively studied system providing a broad spectrum of ecosystem goods and services. This region, encompassing the continental shelf area between Cape Hatteras and the Gulf of Maine, spans approximately 250,000 km^2 and supports some of the highest revenue fisheries in the U.S. The system historically underwent profound changes due to very heavy exploitation by distant-water and domestic fishing fleets. Further, the region is experiencing changes in climate and physical forcing that have contributed to large-scale alteration in ecosystem structure and function. Projections indicate continued future climate change related to both short and medium terms cyclic trends as well as non-cyclic climate change. The main findings of the 2011 Ecosystem Assessment Program update are:

-The Northeast Shelf Large Marine Ecosystem can be divided into four Ecological Production Units, which can in turn provide spatial domains for Ecosystem Based Fisheries Management.

-Atlantic basin scale climate indices, the North Atlantic Oscillation and the Atlantic Multidecadal

Oscillation, are at extreme levels, which are reflected in local scale climate changes.

-The physical nature of the Northeast U.S. Continental Shelf Large Marine Ecosystem continues to change, notably there has been a decline in Labrador origin water, which influences salinity and food web processes in the ecosystem, and, there has been an increase in water column stratification, which affects the vertical transport of nutrients.

-Recent increases in primary phytoplankton production are not matched by increases in secondary zooplankton production raising the concern that the phytoplankton community structure is shifting to species that fail to effectively enter the food web.

-Many benthic resources have increased in recent years, which can be attributed to both fishery management strategies and environmental effects. The total biomass of fish species remains high.

-Though revenues have remained at high levels in the commercial fishing industry, employment in marine-related employment sectors has declined in recent years.

NMFS provided a 2014 update, available at http://www.nefsc.noaa.gov/ecosys/advisory/current/ with the following summary:

> -Sea surface temperatures (SSTs) in the Northeast Shelf Large Marine Ecosystem during 2013 represented a moderation of thermal conditions compared to the record highs observed in 2012. The moderation in temperature was not uniform over the ecosystem, with more cooling occurring in the southern part of the ecosystem.
>
> -Bottom temperature collected during the most recent fall survey indicate that benthic thermal conditions in the Middle Atlantic Bight have cooled to below average and have remained above average in the Gulf of Maine.
>
> -The fall bloom on the Northeast Shelf was poorly developed with the exception of some bloom activity in the Gulf of Maine; no fall bloom was detected on the Georges Bank.
>
> -Despite the moderation in thermal conditions on the Shelf, warm water thermal habitats remained at high levels in 2013.
>
> -The arrival of the fall thermal transition has gotten progressively later in all areas of the Northeast Shelf, with the most pronounced shift occurring in the northern part of the ecosystem. The shift in fall timing has delayed fall by nearly a month in some areas.
>
> -An experimental forecasting data product suggests that sea surface temperature will remain above average through summer into fall.

Also see http://nefsc.noaa.gov/ecosys/ for a variety of ecosystem considerations being investigated by the NMFS Northeast Fisheries Science Center.

Since mackerel and the squids at least partially feed on small pelagics or their larvae at some life stage, and all MSB species are preyed upon by a wide variety of finfish at some life stage, mean catches of several fish groups in the NEFSC bottom trawl surveys are provided in the figure below. The 2009 Ecosystem Assessment Program (http://www.nefsc.noaa.gov/publications/crd/crd0911/crd0911.pdf) also noted that consumption of finfish by marine mammals has had a substantially increasing trend.

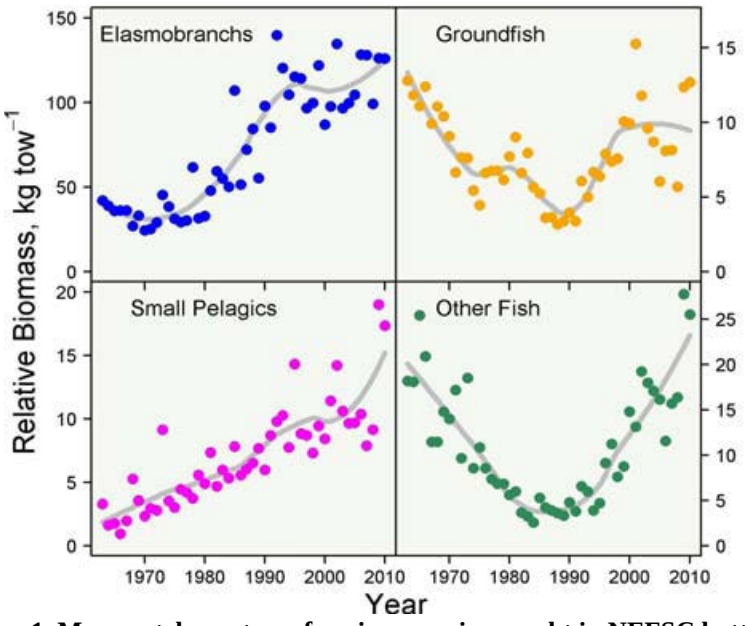

Figure 1. Mean catch per tow of various species caught in NEFSC bottom trawl surveys

6.3 Habitat, Including Essential Fish Habitat (EFH)

Pursuant to the Magnuson Stevens Act / EFH Provisions (50 CFR Part 600.815 (a)(1)), an FMP must describe EFH by life history stage for each of the managed species in the plan. This information was updated via Amendment 11 to the MSB FMP. EFH for the four species managed under this FMP is described using fundamental information on habitat requirements by life history stage that is summarized in a series of EFH source documents produced by NMFS and available at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. The updated EFH designations (text and maps) are available at http://www.habitat.noaa.gov/protection/efh/efhmapper/. In general, EFH for the MSB species is the water column itself, and the species have temperature and prey preferences/needs that determine the habitat suitability of any particular area/depth, thus fishing activity has minimal impacts. Longfin squid also use hard bottom, submerged vegetation, other natural or artificial structure, and sand or mud to attach/anchor eggs, but there are no known preferences for different types of substrates or indications that fishing activity may negatively impact longfin squid egg EFH.

There are other lifestages of federally-managed species that have designated EFH that may be susceptible to adverse impacts from bottom trawls used in SMB fisheries, depending on the geographic distribution of their essential habitats in relation to the footprint of SMB bottom trawl fishing activity. EFH for all the federally-managed species in the region that could potentially be affected by SMB bottom trawling activity is described in the following table (see Stevenson et al 2004):

Table 17. EFH descriptions for species vulnerable to trawl gear

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
American plaice	juvenile	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45 - 150	Fine grained sediments, sand, or gravel
American plaice	adult	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45 - 175	Fine grained sediments, sand, or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75	Cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150	Rocks, pebbles, or gravel
Atl halibut	juvenile	GOM and GB	20 - 60	Sand, gravel, or clay
Atl halibut	adult	GOM and GB	100 - 700	Sand, gravel, or clay
Barndoor skate	juvenile/ adult	Eastern GOM, GB, SNE, Mid-Atlantic Bight to Hudson Canyon	l0-750, most < 150	Mud, gravel, and sand
Black sea bass	juvenile	GOM to Cape Hatteras, NC, including estuaries from Buzzards Bay to Long Island Sound, Gardiners Bay, Barnegat Bay to Chesapeake Bay, Tangier/ Pocomoke Sound, and James River	1 - 38	Rough bottom, shellfish/ eelgrass beds, manmade structures, offshore clam beds, and shell patches
Black sea bass	adult	GOM to Cape Hatteras, NC, including Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay, and James River	20 - 50	Structured habitats (natural and manmade), sand and shell substrates preferred
Clearnose skate	juvenile/ adult	GOM, along continental shelf to Cape Hatteras, NC, including the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, most < 111	Soft bottom and rocky or gravelly bottom
Haddock	juvenile	GB, GOM, and Mid-Atlantic south to Delaware Bay	35 - 100	Pebble and gravel
Haddock	adult	GB, eastern side of Nantucket Shoals, and throughout GOM	40 - 150	Broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Little skate	juvenile/ adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes estuaries from Buzzards Bay south to mainstem Chesapeake Bay	0-137, most 73 - 91	Sandy or gravelly substrate or mud
Ocean pout	eggs	GOM, GB, SNE, and Mid-Atlantic south to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay and Cape Cod Bay	<50	Generally sheltered nests in hard bottom in holes or crevices
Ocean pout	juvenile	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, and Cape Cod Bay	< 50	Close proximity to hard bottom nesting areas
Ocean pout	adult	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, MA Bay, Boston Harbor, and Cape Cod Bay	< 80	Smooth bottom near rocks or algae
Pollock	adult	GOME, GB, SNE, and Mid-Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., MA Bay, Cape Cod Bay, Long Island Sound	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off SNE, and Mid-Atlantic south to Cape Hatteras, including the following estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, and Chesapeake Bay	< 100	Shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras, these estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130	In sand and mud, in depressions
Redfish	juvenile	GOM, southern edge of GB	25 - 400	Silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50 - 350	Silt, mud, or hard bottom

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Rosette skate	juvenile/ adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530, most 74-274	Soft substrate, including sand/mud bottoms
Scup	juvenile/ adult	GOM to Cape Hatteras, NC, including the following estuaries: MA Bay, Cape Cod Bay to Long Island Sound, Gardiners Bay to Delaware inland bays, and Chesapeake Bay	0-38 for juv 2-185 for adult	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Silver hake	juvenile	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, ME, MA Bay to Cape Cod Bay	20 – 270	All substrate types
Summer Flounder	juvenile/ adult	GOM to Florida – estuarine and over continental shelf to shelf break	0-250	Demersal/estuarine waters, varied substrates. Mostly inshore in summer and offshore in winter.
Smooth skate	juvenile/ adult	Offshore banks of GOM	31–874, most 110-457	Soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile/ adult	GOM and GB	18-2000, most 111-366	Sand, gravel, broken shell, pebbles, and soft mud
Tilefish	juvenile/ adult	Outer continental shelf and slope from the U.S./Canadian boundary to the Virginia/North Carolina boundary	100 - 300	Burrows in clay (some may be semi-hardened into rock)
White hake	juvenile	GOM, southern edge of GB, SNE to Mid-Atlantic and the following estuaries: Passamaquoddy Bay, ME to Great Bay, NH, Massachusetts Bay to Cape Cod Bay	5 - 225	Seagrass beds, mud, or fine grained sand
Winter flounder	adult	GB, inshore areas of GOM, SNE, Mid- Atlantic south to Delaware Bay and the estuaries from Passamaquoddy Bay, ME to Chincoteague Bay, VA	1 - 100	Mud, sand, and gravel
Winter skate	juvenile/ adult	Cape Cod Bay, GB, SNE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, most < 111	Sand and gravel or mud
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500	Fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300	Fine grained substrate
Yellowtail flounder	adult	GB, GOM, SNE and Mid-Atlantic south to Delaware Bay and these estuaries: Sheepscot River and Casco Bay, ME, MA Bay to Cape Cod Bay	20 - 50	Sand or sand and mud

Fishery Impact Considerations

Actions implemented that affect species with overlapping EFH were assessed in Amendment 9 to the MSB FMP in 2008 (http://www.mafmc.org/fmp/history/smb-hist.htm). Amendment 9 summarized Stevenson et al. 2004's findings on bottom-trawling's habitat impacts as:

> "In studies examining the effect of bottom otter trawling on a variety of substrate types, it was demonstrated that the physical effects of trawl doors contacting the bottom produced furrows and some shifts in surface sediment composition, although there is a large variation in the duration of these impacts. Typically the more dynamic environment and less structured bottom composition, the shorter the duration of impact. This type of fishing was demonstrated to have some effects on composition and biomass of benthic species in the affected areas, but the directionality and duration of these effects varied by study and substrate types."

When the mackerel fishery has been active in recent years, mackerel are primarily caught by mid-water trawls which only occasionally impact the bottom (see NMFS 2005), but longfin squid, *Illex* squid, and butterfish are primarily caught with mobile bottom-tending gear that does contact the bottom. Industry contacts report that MSB effort is generally over sand/mud bottoms that will not damage nets and that "hangs" or areas with structure have been mapped over the years and are avoided. Amendment 9 included an analysis of the adverse impacts of the MSB fisheries on EFH (per section 303(a)(7) of the MSA). In Amendment 9 the Council determined that bottom trawls used in MSB fisheries do have the potential to adversely affect EFH for some federally-managed fisheries in the region and closed portions of two offshore canyons (Lydonia and Oceanographer) to squid trawling. Subsequent closures were implemented in these and two other canyons (Veatch and Norfolk) to protect tilefish EFH by prohibiting all bottom trawling activity.

Because there have been no significant changes to the manner in which the MSB fisheries are prosecuted, and because none of the alternatives being considered in this document should adversely affect EFH (see section 7.0), no additional alternatives to minimize adverse effects on EFH are considered as part of this management action. The Council is also actively considering protections for deep-sea corals on the outer continental shelf and slope via Amendment 16 to the MSB FMP.

6.4 ESA Listed Species and MMPA Protected Species

There are numerous species which inhabit the environment within the management unit of this FMP 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 of 1972 (MMPA). Eighteen species are classified as endangered or threatened under the ESA, while the rest are protected by the provisions of the MMPA. The subset of these species that are known to have interacted with the MSB fisheries is starred in the list below, including several candidate species (species being considered for listing as an endangered or threatened species).

Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends considering conservation actions to limit the potential for adverse effects on candidate species. The Protected Resources Division of the NMFS Northeast Regional Office has initiated review of recent stock assessments, bycatch information, and other information for these candidate species which will be incorporated in the status review reports for candidate species

* = Known to have interacted with MSB fisheries

Cetacean Species	**Status**
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Beaked whales (*Ziphius and Mesoplodon spp*.)	Protected
*Risso's dolphin (*Grampus griseus*)	Protected
*Pilot whale (*Globicephala spp*.)	Protected

*White-sided dolphin (*Lagenorhynchus acutus*)	Protected
*Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella spp*.)	Protected
*Bottlenose dolphin (*Tursiops truncatus*)	Protected

Sea Turtles Species	**Status**
*Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
*Loggerhead sea turtle (*Caretta caretta*)	
-Northwest Atlantic DPS	Threatened

Fish Species	**Status**
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon – Gulf of Main DPS(*Salmo salar*)	Endangered
*Atlantic sturgeon (*Acipenser oxyrinchus*)	
Chesapeake Bay DPS	Endangered
New York Bight DPS	Endangered
Carolina DPS	Endangered
South Atlantic DPS	Endangered
Gulf of Maine DPS	Threatened
Cusk (*Brosme brosme*)	Candidate

Protected Species Interactions with the Managed Resources – Includes Fishery Classification under Section 118 of Marine Mammal Protection Act

Species	Status
Common dolphin (*Delphinus delphis*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Pilot whale (*Globicephala spp*.)	Protected
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	
-Northwest Atlantic DPS	Threatened
Risso's dolphin (*Grampus griseus*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected

Under section 118 of the MMPA, NMFS must publish and annually update the List of Fisheries (LOF), which places all U.S. commercial fisheries in one of three categories based on the level of incidental serious injury and mortality of marine mammals in each fishery (arranging them according to a two tiered classification system). The categorization of a fishery in the LOF determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, Northeast Fishery Observer Program observer coverage, and take reduction plan requirements. The classification criteria consists of a two tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock (Tier 1) and then addresses the impact of the individual fisheries on each stock (Tier 2). If the total annual mortality and serious

injury of all fisheries that interact with a stock is less than 10% of the Potential Biological Removal (PBR) for the stock then the stock is designated as Tier 1 and all fisheries interacting with this stock would be placed in Category III. Otherwise, these fisheries are subject to categorization under Tier 2. PBR is the product of minimum population size, one-half the maximum productivity rate, and a "recovery" factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The current List of Fisheries is available at: http://www.nmfs.noaa.gov/pr/interactions/lof/.

Under Tier 2, individual fisheries are subject to the following categorization:

Category I. Annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50% of the PBR level;
Category II. Annual mortality and serious injury of a stock in a given fishery is greater than one percent and less than 50% of the PBR level; or

Category III. Annual mortality and serious injury of a stock in a given fishery is less than one percent of the PBR level.

In Category I, there is documented information indicating a "frequent" incidental mortality and injury of marine mammals in the fishery. In Category II, there is documented information indicating an "occasional" incidental mortality and injury of marine mammals in the fishery. In Category III, there is information indicating no more than a "remote likelihood" of an incidental taking of a marine mammal in the fishery or, in the absence of information indicating the frequency of incidental taking of marine mammals, other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, and species and distribution of marine mammals in the area suggest there is no more than a remote likelihood of an incidental take in the fishery. "Remote likelihood" means that annual mortality and serious injury of a stock in a given fishery is less than or equal to 10% of the PBR level or, that it is highly unlikely that any marine mammal will be incidentally taken by a randomly selected vessel in the fishery during a 20-day period or, in the absence of reliable information it is at the discretion of the Assistant Administrator for Fisheries to determine whether the incidental injury or mortality qualifies (or not) for a specific category.

Marine Mammal Stock Assessment Reports:

As required by the Marine Mammal Protection Act (MMPA), NMFS has incorporated earlier public comments into revisions of marine mammal stock assessment reports (SARs). These reports contain information regarding the distribution and abundance of the stock, population growth rates and trends, the stock's Potential Biological Removal level, estimates of annual human-caused mortality and serious injury from all sources, descriptions of the fisheries with which the stock interacts, and the status of the stock. The MMPA requires these assessments to be reviewed at least annually for strategic stocks and stocks for which significant new information is available, and at least once every 3 years for non-strategic stocks. The most recent SARs are available at: http://www.nmfs.noaa.gov/pr/sars/.

NMFS elevated the (mid-water) MSB fishery to Category I in the 2001 LOF but it was reduced to a Category II fishery in 2007 (see discussion below describing the Atlantic Trawl Gear Take Reduction Plan). The reduction in interactions documented between the MSB fisheries and several species/stocks of marine mammals compared to previous years led to the re-classification. No classification changes have occurred since 2007.

6.4.1 Commercial Fisheries Interactions

The following is a description of species of concern because they are protected under MMPA and, as discussed above, have had documented interactions with fishing gears used to harvest species managed under this FMP. Five year take averages are provided as found in Waring *et al* (2013) unless otherwise noted.

Common dolphin (PBR = 1,125, all fisheries annual take 2007-2011 = 168)

The common dolphin may be one of the most widely distributed species of cetaceans, as it is found worldwide in temperate, tropical, and subtropical seas. They are widespread from Cape Hatteras northeast to Georges Bank (35° to 42° North latitude) in outer continental shelf waters from mid-January to May. Exact total numbers of common dolphins off the US or Canadian Atlantic coast are unknown, although the most recent Stock Assessment Report considers the best abundance estimate for common dolphins to be 173,486 (Coefficient of Variation (CV) =0.36). PBR for the western North Atlantic common dolphin is 1,125. See Waring *et al*. 2013 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Fishery Interactions - The following fishery interaction information was taken from the latest stock assessment for common dolphin contained in Waring *et al.* (2013) which summarizes incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2013).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2007-2010 average annual mortality attributed to the northeast bottom trawl was 19 animals (CV=0.13). The 2007-2010 average annual mortality attributed to the Mid-Atlantic bottom trawl was 96 animals (CV=0.13). No estimates were generated for 2011. The portion attributable to specific fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality of common dolphin during 2007-2010 in the Mid-Atlantic bottom trawl fishery was 96 animals (CV=0.13). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 1 (CV=0.7) during 2007-2011. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Atlantic white-sided dolphin (*Lagenorhynchus acutus*) (PBR = 304, all fisheries annual take 2007-2011 = 117)

Atlantic white-sided dolphins (*Lagenorhynchus acutus)* are found in temperate and sub-polar waters of the North Atlantic, primarily in continental shelf waters to the 100m depth contour. The exact total number of white-sided dolphins (*Lagenorhynchus acutus)* along the eastern US and Canadian Atlantic coast is unknown, although the best available current abundance estimate for white-sided dolphins in the western North Atlantic stock is 48,819 (CV=0.61). PBR for the western North Atlantic stock of white-sided dolphin (*Lagenorhynchus acutus)* is 304. See Waring *et al*. 2013 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Fishery Interactions - The following information was taken from the latest stock assessment for white-sided dolphin (*Lagenorhynchus acutus)* contained in Waring *et al* (2013) which summarized incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2013).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2007-2011 average annual mortality attributed to the northeast bottom trawl was 73 animals (CV=0.15). The 2007-2011 average annual mortality attributed to the Mid-Atlantic bottom trawl was 4 animals (CV=0.2). The portion attributable to the specific fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality during 2007-2011 in the Mid-Atlantic bottom trawl fishery was 4 animals (CV=0.2). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 6 (CV=0.53) during 2007-2011. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Long-finned (*Globicephala melas*) and short-finned (*Globicephala macrorhynchus*) pilot whales (PBR = 358, all fisheries annual take 2007-2011 = 162) .

There are two species of pilot whales in the Western Atlantic - the Atlantic (or long-finned) pilot whale, *Globicephala melas*, and the short-finned pilot whale, *G. macrorhynchus*. These species (sp.) are difficult to identify to the species level at sea. Preliminary analysis suggests the following distribution of the two species: sightings south of the mouth of the Chesapeake Bay are likely short-finned pilot whales, as are offshore (near the 4,000m depth contour) sightings from off the mouth of the Chesapeake Bay through off New Jersey. Sightings from the mouth of the Chesapeake Bay to the Southern Edge of Georges Bank along the 100/1,000 m depth contours are likely mixed. Sightings in the Gulf of Maine and east and north of Cape Cod are likely long-finned pilot whales, as are sightings in shelf waters immediately southeast of Nantucket. The best estimate population size for short-finned pilot whales is 21,515 (C.V. = 0.37) and for long-finned pilot whales to be 26,535 (C.V. = 0.35). PBR for short-finned pilot whales is estimated to be 159 and PBR for long-finned pilot whales is estimated to be 199 (total is 358). See Waring *et al*. 2013 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information. 2011 estimates were not available for all gear types when this document was written.

Fishery Interactions - The following information was taken from the latest stock assessment for pilot whales (*Globicephala* sp.) contained in Waring *et al* (2011) which summarized incidental mortality of this species. Annual averages are presented below – details on encounters may be reviewed in Waring *et al* (2011).

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2007-2010 average annual mortality attributed to the northeast bottom trawl was 10 animals (CV=0.18). The 2007-2010 average annual mortality attributed to the Mid-Atlantic bottom trawl was 29 animals (CV=0.19). The portion attributable to specific fisheries is unknown.

Atlantic Mackerel - This fishery is primarily prosecuted with mid-water trawl in the Mid-Atlantic but also with bottom trawl as well. As noted above, the mean estimated annual mortality during 2007-2010 in the Mid-Atlantic bottom trawl fishery was 29 animals (CV=0.19). For the Mid-Atlantic mid-water trawl fishery the mean estimated annual mortality of common dolphin was 2.4 (CV=0.99) during 2007-2011. The portion attributable to the directed Atlantic mackerel fishery is unknown.

Risso's dolphin (*Grampus griseus*) (PBR = 126, all fisheries annual take 2007-2011 = 62)

Risso's dolphins are distributed worldwide in tropical and temperate seas, and in the Northwest Atlantic occur from Florida to eastern Newfoundland. Off the northeast U.S. coast, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank during spring, summer, and autumn. In winter, the range is in the Mid-Atlantic Bight and extends outward into oceanic waters. The best population estimate for the western North Atlantic Risso's dolphin is 18,250 (CV=0.46). See Waring *et al*. 2013 (http://www.nmfs.noaa.gov/pr/sars/) for more life history information.

Foreign Fishery Interactions - NMFS foreign-fishery observers reported four deaths of Risso's dolphins incidental to squid and mackerel fishing activities in the continental shelf and continental slope waters between March 1977 and December 1991. In the pelagic pair trawl fishery, one mortality was observed in 1992.

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2007-2011 average annual mortality attributed to the northeast bottom trawl was 2.5 animals (CV=0.24). The 2007-2011 average annual mortality attributed to the Mid-Atlantic bottom trawl was 42 animals (CV=0.29). The portion attributable to specific fisheries is unknown.

Mid-Atlantic Mid-water Trawl

One Risso's dolphin mortality was observed in this fishery for the first time in 2008. Until additional information is obtained, the assumed average mortality in this fishery is 0.2 animals (1 animal/5 years).

Bottlenose dolphin (*Tursiops truncatus*) Offshore Form (from Waring et al 2013). (PBR = 561, all fisheries annual take = 42)

There are two morphologically and genetically distinct bottlenose dolphin morphotypes described as the coastal and offshore forms. Both inhabit waters in the western North Atlantic Ocean along the U.S. Atlantic coast. See http://www.nmfs.noaa.gov/pr/sars/ for more life history information.

Fisheries Information

Illex/Longfin squid/butterfish - These fisheries are included in both the Northeast and Mid-Atlantic bottom trawl fisheries. The 2007-2011 average annual mortality attributed to the northeast bottom trawl was 20 animals (CV=0.52). The 2007-2011 average annual mortality attributed to the Mid-Atlantic bottom trawl was 20 animals (CV=0.17). The portion attributable to specific fisheries is unknown.

Earlier Interactions

Thirty-two bottlenose dolphin mortalities were observed in the pelagic pair trawl fishery between 1991 and 1995. Estimated annual fishery-related mortality (CV in parentheses) was 13 dolphins in 1991 (0.52), 73 in 1992 (0.49), 85 in 1993 (0.41), 4 in 1994 (0.40) and 17 in 1995 (0.26).

Although there were reports of bottlenose dolphin mortalities in the foreign squid mackerel butterfish fishery during 1977-1988, there were no fishery-related mortalities of bottlenose dolphins reported in the self-reported fisheries information from the mackerel trawl fishery during 1990-1992.

One bottlenose dolphin mortality was documented in the North Atlantic bottom trawl in 1991 and the total estimated mortality in this fishery in 1991 was 91 (CV=0.97). Since 1992 there were no bottlenose dolphin mortalities observed in this fishery.

6.4.2 Atlantic Trawl Gear Take Reduction Plan

In September 2006, the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) convened the Atlantic Trawl Gear Take Reduction Team (ATGTRT) under the Marine Mammal Protection Act (MMPA). The ATGTRT was convened to address incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), common dolphins (*Delphinus delphis*), and Atlantic white-sided dolphins (*Lagenorhynchus acutus*) in several trawl gear fisheries operating in the Atlantic Ocean. These marine mammal species are known to interact with the Mid-Atlantic Mid-Water Trawl, the Mid-Atlantic Bottom Trawl, Northeast Mid-Water Trawl and the Northeast Bottom Trawl fisheries.

The immediate goal of a Take Reduction Plan is to reduce, within six months of implementation, the incidental serious injury or mortality of marine mammals from commercial fishing to levels less than PBR. The long-term goal is to reduce, within five years of its implementation, the incidental serious injury and mortality of marine mammals from commercial fishing operations to insignificant levels approaching a zero serious injury and mortality rate, taking into account the economics of the fishery, the availability of existing technology, and existing state or regional FMPs.

Presently, none of these marine mammal stocks under consideration by the ATGTRT are classified as a strategic stock nor do they currently interact with a Category I fishery. NOAA's General Counsel legal guidance has stated that neither the 11 month timeline for the development of a Take Reduction Plan nor the 5 year goal for reaching the Zero Mortality Rate Goal apply to non-strategic stocks that do not interact with Category I fisheries. The ATGTRT agreed that while a take reduction plan may not be required at this time, efforts should be made to identify and conduct research necessary to identify measures to reduce serious injury and mortality of marine mammals in Atlantic trawl fisheries and, ultimately, to achieve the MMPA's Zero Mortality Rate Goal. This information is captured in the Atlantic Trawl Gear Take Reduction Strategy (ATGTRS).

The ATGTRT recommended that two plans be developed to achieve the overall goal of the Take Reduction Strategy to reduce the incidental take of marine mammals in Atlantic trawl fisheries. These include an Education and Outreach Plan and a Research Plan as part of an overall take reduction strategy. The ATGTRT established two sub-groups to develop the Education and Outreach and Research Plans. The Education and Outreach Plan identifies activities that promote the exchange of information necessary to reduce the bycatch of marine mammals in Atlantic trawl fisheries. The Research Plan identifies information and research needs necessary to improve our understanding of the

factors resulting in the bycatch in Atlantic trawl fisheries. The results of the identified research will be used to direct additional research and/or identify measures to reduce the serious injury and mortality of short- and long-finned pilot whales, Atlantic white-sided dolphins, and common dolphins in trawl fisheries to levels approaching the Zero Mortality Rate Goal. The Atlantic Trawl Gear Take Reduction Strategy is available at: http://www.nero.noaa.gov/prot_res/atgtrp/.

6.4.3 Description of Turtle Species with Documented Interactions with the MSB Fisheries

The 2013 Biological Opinion for the MSB (http://www.greateratlantic.fisheries.noaa.gov/protected/section7/bo/actbo.html) fisheries contains detailed information on sea-turtle interactions. This document updates information on sea turtle interactions with trawl gear in the MSB fisheries. Summary information is provided below and the full document above may be consulted for details. The Opinion concluded that Mid-Atlantic fisheries (incuding MSB) "may adversely affect, but is not likely to jeopardize, the continued existence of" Loggerhead (specifically, the NWA DPS), leatherback, Kemp's ridley, and green sea turtles.

The primary species likely to be adversely affected by the MSB fishery would be loggerhead sea turtles, as they are the most abundant threatened species occurring in U.S. Atlantic waters. Sea sampling and observer data indicate that fewer interactions occur between fisheries that capture MSB and leatherback, Kemp's ridley, and green sea turtles. The primary area of impact of the directed commercial fishery for MSB on sea turtles is likely bottom otter trawls in waters of the Mid-Atlantic from Virginia through New York, from late spring through fall (peak longfin squid abundance July-October). In New England, interactions with trawl gear may occur in summer through early fall (peak squid abundance August -September), although given the level of effort, the probability of interactions is much lower than in the Mid-Atlantic.

There have been 9 observed sea turtle takes in the MSB fishery during the past 11 years (using top species landed). All sea turtle takes have occurred in bottom otter trawl gear participating in the squid fishery. Loggerhead sea turtles are more likely to interact with MSB trawl gear but green, Kemps ridley and leatherback interaction may also occur. All sea turtles were released alive, except a 2002 take, when a gillnet was hauled up as part of the catch when the loggerhead turtle entangled was fresh dead.

Based on data collected by observers for the reported sea turtle captures in or retention in MSB trawl gear, the NEFSC has estimated loggerhead bycatch in the MSB trawl fishery 2005-2008 to be about 25 animals annually (Warden 2011). NMFS estimates 1 leatherback, 2 green, and 2 Kemp's ridley turtles are taken each year based on the very low encounter rates for these species and/or unidentified turtles (Murray 2008).

On March 16, 2010, the Services announced 12-month findings on petitions to list the North Pacific populations and the Northwest Atlantic populations of the loggerhead sea turtle as DPSs with endangered status and published a proposed rule to designate nine loggerhead DPSs worldwide, seven as endangered (North Pacific Ocean DPS, South Pacific Ocean DPS, Northwest Atlantic Ocean DPS, Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, and Southeast Indo-Pacific Ocean DPS) and two as threatened (Southwest Indian Ocean DPS and South Atlantic Ocean DPS). On March 22, 2011, the timeline for the final determination was extended for six months until September 16, 2011 (76 FR 15932).

A final loggerhead listing determination was published on September 22, 2011 (76 FR 58867). Unlike the proposed listing, the final listing designates four DPSs (Northwest Atlantic, South Atlantic, Southeast Indo-Pacific, Southwest Indian) as threatened, and five DPSs (Northeast Atlantic, Mediterranean, North Indian, North Pacific, South Pacific) as endangered. Critical habitat has also recently been designated – see http://www.nmfs.noaa.gov/pr/species/turtles/criticalhabitat_loggerhead.htm for details.

6.4.4 Atlantic sturgeon

In 2012 NOAA's Fisheries Service announced a final decision to list five distinct population segments (DPS) of Atlantic sturgeon under the Endangered Species Act. The Chesapeake Bay, New York Bight, Carolina, and South Atlantic DPSs of Atlantic sturgeon were listed as endangered, while the Gulf of Maine DPS was listed as threatened. Atlantic sturgeon from any of the five DPSs could occur in areas where MSB fisheries operate, and the species has been captured in gear targeting longfin squid (Stein et al. 2004a, ASMFC 2007). Therefore, this Environmental Assessment includes background information on Atlantic sturgeon in this section and considers the anticipated effects of the action on Atlantic sturgeon in Section 7 of this Environmental Assessment. Detailed life history information may be found in the 2007 Atlantic Sturgeon Status Review, available at: http://sero.nmfs.noaa.gov/pr/esa/Sturgeon/Atl%20Sturgeon/atlanticsturgeon2007.pdf.

Since the ESA listing of Atlantic sturgeon, new stock assessment efforts have been completed (Kocik et al. 2013). Atlantic sturgeon are frequently sampled during the Northeast Area Monitoring and Assessment (NEAMAP) survey. NEAMAP has been conducting trawl surveys from Cape Cod, Massachusetts to Cape Hatteras, North Carolina in nearshore waters at depths to 18.3 meters (60 feet) during the fall since 2007 and depths up to 36.6 meters (120 feet) during the spring since 2008 using a spatially stratified random design with a total of 35 strata and 150 stations per survey. The information from this survey can be directly used to calculate minimum swept area population estimates during the fall, which range from 6,980 to 42,160 with coefficients of variation between 0.02 and 0.57 and during the spring, which range from 25,540 to 52,990 with coefficients of variation between 0.27 and 0.65. These are considered minimum estimates because the calculation makes the unlikely assumption that the gear will capture 100% of the sturgeon in the water column along the tow path. For this analysis, we have determined that using the median value of the 50% efficiency as the best estimate of the Atlantic sturgeon ocean population is most appropriate at this time. This results in a total population size estimate of 67,776 fish, which is considerably higher than the estimates that were available at the time of listing (Kocik et al. 2013).

Fisheries Interactions

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon (ASMFC TC 2007). Sturgeon deaths were rarely reported in the otter trawl observer dataset (ASMFC TC 2007). However, the level of mortality after release from the gear is unknown (Stein et al. 2004a). In a review of the Northeast Fishery Observer Program (NEFOP) database for the years 2001-2006, observed bycatch of Atlantic sturgeon was used to calculate bycatch rates that were then applied to commercial fishing effort to estimate overall bycatch of Atlantic sturgeon in commercial fisheries. This review indicated sturgeon bycatch occurred in statistical areas abutting the coast from Massachusetts (statistical area 514) to North Carolina (statistical area 635)

(ASMFC TC 2007). Based on the available data, participants in an ASMFC bycatch workshop concluded that sturgeon encounters tended to occur in waters less than 50 m throughout the year, although seasonal patterns exist (ASMFC TC 2007). The ASMFC analysis determined that an average of 650 Atlantic sturgeon mortalities occurred per year (during the 2001 to 2006 timeframe) in sink gillnet fisheries. Stein et al. (2004a), based on a review of the NMFS Observer Database from 1989-2000, found clinal variation in the bycatch rate of sturgeon in sink gillnet gear with lowest rates occurring off of Maine and highest rates off of North Carolina for all months of the year.

In an updated, preliminary analysis, the Northeast Fisheries Science Center (NEFSC) was able to use data from the NEFOP database to provide updated estimates for the 2006 to 2010 timeframe. Data were limited by observer coverage to waters outside the coastal boundary and north of Cape Hatteras, NC. Sturgeon included in the data set were those identified by federal observers as Atlantic sturgeon, as well as those categorized as unknown sturgeon. At this time, data were limited to information collected by the observer program; limited data collected in the At-Sea Monitoring Program were not included, although preliminary views suggest the incidence of sturgeon encounters was low.

The preliminary analysis apportioned the estimated weight of all sturgeon takes to specific fishery management plans. The analysis estimates that between 2006 and 2010, a total of 15,587 lbs of Atlantic sturgeon were captured and discarded in bottom otter trawl (7,740 lbs) and sink gillnet (7,848 lbs) gear. The analysis results indicate that 7.1% (550 lbs) of the weight of sturgeon discards in bottom otter trawl gear could be attributed to the large mesh bottom trawl fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort. Additionally, the analysis results indicate that 4.0% (314 lbs) of the weight of sturgeon discards in sink gillnet gear could be attributed to the large mesh gillnet fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort.

These additional data support the conclusion from the earlier bycatch estimates that the MSB fisheries may interact with Atlantic sturgeon. A Biological Opinion (NMFS 2013) was issued on December 16, 2013 and concluded that the MSB fisheries may adversely affect, but is not likely to jeopardize the continued existence of any of the five DPSs of Atlantic sturgeon. The Biological Opinion included reasonable and prudent measures, as well as terms and conditions which will further reduce impacts to Atlantic sturgeon.

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6.5 Other Non-Target Species in MSB Fisheries

Illex

The primary species taken incidentally and discarded in the directed *Illex* fishery over the most recent five years of data (2009-2013) are listed in a table on the next page. Of the fisheries in this FMP, *Illex* is generally considered to have the lowest catches of incidental species.

The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. Presumably some criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal. Thus to begin this process, staff first reviewed 2009-2013 trips in the dealer weighout database to see if a certain trip definition could account for most *Illex* landed. The result of this review resulted in the following definition for *Illex* trips using landings: All trips that had at least 50% *Illex* by weight. This definition results in capturing 99% of all *Illex* landings in the dealer weighout database 2009-2013 and was applied to the observer database to examine discards in the *Illex* fishery. The resulting set of trips in the observer database included 17 on average for each year 2009-2013 (83 total).

Information for the species that make up most discards (97% of all discards) on these trips is presented in the table below. For non-target species that are managed under their own fishery management plan, incidental catch/discards are also considered as part of the management of that fishery. Readers will note the relatively high FISH, NK numbers. This was caused by one haul in 2009 that was too big to bring aboard a vessel and some had to be dumped (installed net sensors failed). While it had to be recorded as FISH, NK, the observer's log suggests that it was mostly squid ("Unknown as to how much was released, but observer saw a swordfish come out along with the squid."). Also, of the 75,042 pounds that did come aboard from this haul, the observer recorded only 42 pounds of *Illex* discarded and no other species observed.

The observed *Illex* caught on these trips accounted for approximately 20% of the total *Illex* caught. While a very rough estimate, especially given the low observer coverage in small mesh fisheries and non-accounting for spatial and temporal trends, one can use the information in the table below and the fact that about 11,447 mt of *Illex* were caught annually 2009-2013 to generally and very roughly estimate annual incidental catch for the species in the table. This is the last column in the table and while this information is provided, readers are strongly cautioned that while this is a reasonable approach for a quick, rough, and relative estimate given the available data, it is highly imprecise and does not follow the protocol used for official discard estimates.

Table 18. Incidental Catch and Discards in the *Illex* Fishery.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	For every metric ton of Illex caught, pounds of given species caught.	D:K Ratio (species discarded to Illex kept)	Rough Annual Catch (pounds) based on 3-year (2011-2013) average of Illex catch (11,447 mt)
SQUID, SHORT-FIN	14,797,722	120,706	37%	1%	2,205	0.01	25,236,056
BUTTERFISH	71,287	62,871	19%	88%	11	0.00	121,573
FISH, NK	27,732	27,665	9%	100%	4	0.00	47,294
DORY, BUCKLER	42,423	23,318	7%	55%	6	0.00	72,348
SQUID, ATL LONG-FIN	521,489	16,675	5%	3%	78	0.00	889,347
MACKEREL, CHUB	236,313	13,041	4%	6%	35	0.00	403,008
HERRING, NK	11,144	11,144	3%	100%	2	0.00	19,004
HAKE, SPOTTED	10,750	10,188	3%	95%	2	0.00	18,332
SQUID, NK	8,057	7,182	2%	89%	1	0.00	13,741
BEARDFISH	6,321	5,791	2%	92%	1	0.00	10,779
DOGFISH, SPINY	4,117	4,117	1%	100%	1	0.00	7,022
SHAD, AMERICAN	3,426	3,283	1%	96%	1	0.00	5,843

Butterfish

A list of species taken incidentally and discarded in the butterfish fishery has not been calculated because very limited directed fishing for butterfish has occurred recently and no directed trips have been observed. It is also very difficult to identify a recent directed butterfish trip in the observer database and double counting with other fisheries would likely occur due to the recent incidental nature of the fishery. Prior specifications identified red hake, silver hake, spiny dogfish, scup, unclassified skates, fourspot flounder, longfin squid, mackerel, and little skate as primary bycatch and/or discard species in the butterfish fishery. Beginning in 2013 a limited directed fishery for butterfish was re-established and these species could be impacted. However, in previous years when the butterfish fishery operated there was no minimum mesh and attitudes about discarding were different. It is expected that the 3" minimum mesh incorporated as part of the reestablishment of the butterfish fishery will minimize bycatch (further reducing the applicability of previous analyses), and any observer data from trips targeting butterfish will be examined in the future to describe non-target interactions and to determine if additional bycatch minimization measures are needed. There are also ongoing discussion for some of the major butterfish participants to voluntarily notify observer providers so that new discard information can be collected. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery.

Mackerel

Various species are caught incidentally by the mackerel fishery. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. These species will be impacted to some degree by the prosecution of the mackerel fishery.

The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. Presumably some criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal. Thus to begin this process, staff first reviewed 2011-2013 trips in the dealer weighout database to see if a certain trip definition could account for most mackerel landed. Since the mackerel fishery has changed substantially in recent years a more recent, three-year time period was examined. The result of this review resulted in the following definition for mackerel trips using landings: All trips that had at least 50% mackerel by weight and all trips over 100,000 pounds of mackerel regardless of the ratio of other species. This definition results in capturing 90% of all mackerel landings in the dealer weighout database 2011-2013. The other trips with lower mackerel landings landed a variety of species, mostly Atlantic herring, silver hake, longfin squid, and scup. The set of trips in the observer database with the same mackerel criteria included 4 on average for each year 2011-2013 (the mackerel fishery has not been very active in recent years). These trips made 49 hauls of which 94% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water, etc.

Information on catch and discards is provided for observed hauls in the table below. Since there were so few observed trips, extrapolations are not made but the total observed values are provided. Also, given that the amounts of mackerel and Atlantic herring caught on these trips is about the same, and that both were mostly retained, it is not clear if these trips were primarily targeting mackerel or Atl. herring. Fishermen and processors on the Council's MSB Advisory Panel have also reported that mackerel caught in recent years have mostly been caught incidental to Atl. herring fishing rather than during focused mackerel fishing because of the lack of fishable mackerel concentrations.

Table 19. Incidental Catch and Discards in the Mackerel Fishery.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded
MACKEREL, ATLANTIC	3,505,435	79	1%	0%
HERRING, ATLANTIC	3,279,282	337	3%	0%
HERRING, BLUEBACK	28,135	79	1%	0%
ALEWIFE	25,952	1,068	9%	4%
BUTTERFISH	7,596	0	0%	0%
DOGFISH, SPINY	4,992	4,992	44%	100%
FISH, NK	3,885	3,885	34%	100%
SQUID, ATL LONG-FIN	1,193	0	0%	0%
SHAD, AMERICAN	704	4	0%	1%
HAKE, SILVER	693	4	0%	1%
BASS, STRIPED	574	574	5%	100%
SQUID, SHORT-FIN	198	0	0%	0%
SKATE, LITTLE	197	197	2%	100%
SCUP	170	0	0%	0%
OCEAN POUT	149	149	1%	100%
HAKE, RED (LING)	74	54	0%	73%
HADDOCK	60	0	0%	0%
SKATE, WINTER (BIG),	11	0	0%	0%
HERRING, NK	10	10	0%	100%
SKATE, WINTER (BIG)	4	4	0%	100%

The primary non-target species of current concern for mackerel, and for which there are relevant management measures proposed in this action, are river herrings and shads so some additional information on river herrings and shads is provided below.

River Herring

In the most recent Atlantic States Marine Fisheries Commission river herring stock assessment (ASMFC 2012), of the 24 river herring stocks for which sufficient data are available to make a conclusion, 23 were depleted relative to historic levels and one was increasing. The status of 28 additional stocks could not be determined because the time-series of available data was too short. Estimates of coastwide abundance and fishing mortality could not be developed because of the lack of adequate data. The "depleted" determination was used instead of "overfished" because of the many factors that have contributed to the declining abundance of river herring, which include not just directed and incidental fishing, but likely also habitat issues (including dam passage, water quality, and water quantity), predation, and climate change. There are no coastwide reference points.

As part of a recent river herring status review under the Endangered Species Act, NMFS completed an extinction risk analysis (http://www.nero.noaa.gov/prot_res/candidatespeciesprogram/RiverHerringSOC.htm). This analysis investigated trends in river herring relative abundance for each species range-wide as well as for each identified stock complex. This analysis found that "the abundance of alewife range-wide significantly increased over time (mid 1970s-2012), but the increase in blueback herring abundance was not significant (page 7 and Figures 8 and 9 of the referenced document). These range-wide analyses incorporated data from fishery independent surveys with the widest geographic extent, specifically the Northeast Fisheries Science Center spring and fall bottom trawl surveys and Canada's Department of Fisheries and Oceans (DFO) Scotian Shelf survey. Stock-specific analyses incorporated run count data and stock-specific fishery-independent surveys. Stock-specific analyses indicated that the abundance of the Canadian alewife stock complex was significantly increasing, the abundance of the mid-Atlantic blueback herring stock complex was significantly decreasing, and all other analyzed stock complexes were not significantly increasing or decreasing in abundance. The status review concluded that the species did not currently warrant listing under the ESA.

NMFS and the ASMFC are engaged in a proactive conservation strategy for river herring and the Council is also involved in the endeavor. This strategy is described at http://www.nero.noaa.gov/protected/riverherring/tewg/index.html, and will bring a variety of management partners and stakeholders together to address river herring threats and plan conservation and data gathering activities.

Shad

The most recent American shad stock assessment report (ASMFC 2007) identified that American shad stocks are highly depressed from historical levels. Of the 24 stocks of American shad for which sufficient information was available, 11 were depleted relative to historic levels, 2 were increasing, and 11 were stable (but still below historic levels). The status of 8 additional stocks could not be determined because the time-series of data was too short or analyses indicated conflicting trends. Taken in total, American shad stocks do not appear to be recovering. The assessment concluded that current restoration actions need to be reviewed and new ones need to be identified and applied. These

include fishing rates, dam passage, stocking, and habitat restoration. There are no coastwide reference points for American shad. There is no stock assessment available for hickory shad.

River Herring and Shad Catches in the Mackerel Fishery

Amendment 14 analyzed catch of river herrings and shads (RH/S) extensively, and a FEIS is available at http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html. The analysis described in Appendix 2 of Amendment 14's EIS found that Mid-Atlantic mid-water trawl fishing in Quarter 1, which is largely but not completely mackerel fishing, accounted for about 35% of total ocean river herring catch and about 12% of total ocean shad catch from 2005-2010 (about 160.6 metric tons of river herring and 7.6 tons of shad). While it is not clear what impact that level of catch might have on RH/S stocks, these average annual amounts translate to close to 2 million fish (mostly river herring) if a five fish per pound conversion is used (the offshore fishery is likely to encounter juveniles). While there has not been much of a mackerel fishery in recent years, if the mackerel fishery redevelops the RH/S cap, which is proposed to be modified in this action, will limit RH/S catch in the mackerel fishery.

Longfin Squid

Various species are caught incidentally by the longfin squid fishery and will be impacted to some degree by the prosecution of the fishery. Non-target interactions in the longfin squid fishery are also relatively high compared to the other MSB fisheries. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery.

The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. Presumably some criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal. Thus to begin this process, staff first reviewed 2011-2013 trips in the dealer weighout database to see if a certain trip definition could account for most longfin squid landed. Since fisheries evolve over time, and the implementation of the butterfish cap (2011) has likely changed behavior, a relatively recent, three-year time period was examined.

The result of this review resulted in the following definition for longfin squid trips using landings: All trips that had at least 50% longfin squid by weight for retained species. This definition results in capturing 86% of all longfin squid landings in the dealer weighout database 2011-2013. This definition was applied to the observer database to examine discards in the longfin squid fishery. The resulting set of trips in the observer database included 123 on average for each year 2011-2013. These trips made 4243 hauls of which 92% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc.

The observed longfin squid caught on these trips accounted for approximately 6% of the total longfin squid caught (this is the overall coverage rate based on weight). While a very rough estimate, especially given the low observer coverage in small mesh fisheries and non-accounting for spatial and temporal trends, one can use the information in the table immediately following and the fact that about 11,301 mt of longfin squid were caught annually 2011-2013 to generally and roughly estimate annual

incidental catch for the species in the table. This is the last column in the table and while this information is provided, readers are strongly cautioned that while this is a reasonable approach for a quick, rough, and relative estimate given the available data, it is highly imprecise and does not follow the protocol used for official discard estimates. A wide variety of species are caught in the longfin squid fishery, and only those estimated to be caught at a level more than 25,000 pounds per year are included (captures 98% of all discards). Note also that even the estimates that can be calculated would only really be valid for the 86% of landings captured by the chosen directed trip definition. It is even more difficult to assess the other 14% because to some degree the longfin squid is being caught incidental to other fisheries in those cases. Nonetheless, the longfin squid-to-other-species ratios were scaled up to the 100% of longfin squid catch to keep calculations relatively simple.

Table 20. Incidental Catch and Discards in the Longfin Squid Fishery.

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	For every metric ton of Loligo caught, pounds of given species caught.	D:K Ratio (species discarded to longfin kept)	Rough Annual Catch (pounds) based on 3-year (2011-2013) average of longfin catch (11,301 mt)
SQUID, ATL LONG-FIN	4,593,827	90,486	4%	2%	2,205	0.02	24,914,185
SQUID, SHORT-FIN	494,796	208,777	9%	42%	237	0.05	2,683,481
BUTTERFISH	417,791	382,180	16%	91%	200	0.08	2,265,849
DOGFISH, SPINY	323,418	318,468	14%	98%	155	0.07	1,754,029
HAKE, SILVER	320,395	202,460	9%	63%	154	0.04	1,737,631
HAKE, SPOTTED	210,376	205,976	9%	98%	101	0.05	1,140,955
SKATE, LITTLE	140,843	138,712	6%	98%	68	0.03	763,849
SCUP	135,927	79,859	3%	59%	65	0.02	737,187
DOGFISH, SMOOTH	67,320	53,794	2%	80%	32	0.01	365,103
FLOUNDER, SUMMER	67,230	32,711	1%	49%	32	0.01	364,614
BLUEFISH	65,415	21,985	1%	34%	31	0.00	354,770
SKATE, WINTER (BIG)	60,215	58,179	3%	97%	29	0.01	326,570
CRAB, LADY	54,522	54,522	2%	100%	26	0.01	295,696
HERRING, ATLANTIC	49,776	6,101	0%	12%	24	0.00	269,958
SEAWEED, NK	46,325	46,325	2%	100%	22	0.01	251,241
HAKE, RED (LING)	42,880	40,254	2%	94%	21	0.01	232,553
SEA ROBIN, NORTHERN	40,665	40,446	2%	99%	20	0.01	220,540
DORY, BUCKLER	39,798	17,102	1%	43%	19	0.00	215,840
FLOUNDER, FOURSPOT	34,616	34,613	1%	100%	17	0.01	187,735
SEA BASS, BLACK	26,132	18,046	1%	69%	13	0.00	141,722
FLOUNDER, WINTER	23,027	22,688	1%	99%	11	0.01	124,884
BASS, STRIPED	22,989	22,510	1%	98%	11	0.00	124,677
SKATE, NK	19,551	19,551	1%	100%	9	0.00	106,034
MONKFISH	18,523	8,696	0%	47%	9	0.00	100,459
MACKEREL, CHUB	17,879	12,334	1%	69%	9	0.00	96,963
SEA ROBIN, STRIPED	15,358	14,998	1%	98%	7	0.00	83,293
SCALLOP, SEA	13,089	11,070	0%	85%	6	0.00	70,986
SKATE, CLEARNOSE	12,653	12,642	1%	100%	6	0.00	68,620
MACKEREL, ATLANTIC	10,316	5,829	0%	57%	5	0.00	55,945
SHAD, AMERICAN	10,056	8,796	0%	87%	5	0.00	54,536
SKATE, ROSETTE	9,887	9,887	0%	100%	5	0.00	53,621
HADDOCK	9,605	9,597	0%	100%	5	0.00	52,092
FLOUNDER, SAND DAB	8,001	7,969	0%	100%	4	0.00	43,394
LOBSTER, AMERICAN	7,981	5,384	0%	67%	4	0.00	43,284
SQUID, NK	7,188	1,471	0%	20%	3	0.00	38,984
SPOT	7,037	6,882	0%	98%	3	0.00	38,167
SKATE, LITTLE/WINTER,	6,653	6,653	0%	100%	3	0.00	36,082
RAY, BULLNOSE	6,569	6,569	0%	100%	3	0.00	35,624
SQUID EGGS, ATL	5,903	5,903	0%	100%	3	0.00	32,012
DOGFISH, CHAIN	5,136	5,136	0%	100%	2	0.00	27,853
SKATE, BARNDOOR	4,722	4,722	0%	100%	2	0.00	25,608
CRAB, JONAH	4,684	4,462	0%	95%	2	0.00	25,403

6.6 Human Communities and Economic Environment

6.6.1 Fishery Descriptions

This section describes the socio-economic importance of the MSB fisheries. Recent Amendments to the MSB FMP contain additional information, especially demographic information on ports that land MSB species. See Amendments 11 and 14 at http://www.mafmc.org/msb/ for more information or visit NMFS' communities page at: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

For each species with alternatives in this document (which is all MSB species in this case), Section 6.6 describes the following: history of landings, prices and total revenues since 1982, specification performance for the last 10 years, 2013 data for permitted and active vessels by state, 2013 vessel dependence on each managed species as a proportion of total ex-vessel sales, 2011-2013 landings by state, 2011-2013 landings by month, 2011-2013 landings by gear, 2011-2013 landings in key ports, 2011-2013 numbers of active dealers, and 2011-2013 vessel trip report catches by key statistical area. There is also a market overview section for mackerel per the FMP as well as sections for recreational mackerel and longfin squid catch (butterfish are not caught in substantial amounts by recreational fishermen). If less than either 3 vessels or 3 dealers were active for a given species in a given port, or if there is other concern about data confidentiality, some information may be withheld or limited in order to maintain the confidentiality of fishery participants' proprietary business data.

The Council employed a new procedure for gathering information from its Squid-Mackerel-Butterfish Advisory Panel during the 2012 specifications setting process, which it continued for the 2015 specifications. The MSB Advisory Panel created a "Fishery Performance Report" for each species based on the advisors' personal and professional experiences as well as reactions to an "informational document" for each species created by Council staff. The Informational Documents and Fishery Performance Reports may be found here http://www.mafmc.org/ssc-meeting-documents/. These documents, while not NMFS or peer-reviewed, and also containing some preliminary information, were constructed using the same basic analytical techniques as this document and may be of interest to readers looking for additional descriptive fishery information.

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6.6.2 Atlantic mackerel (mackerel)

Historical Commercial Fishery – History of Landings

The modern northwest mackerel fishery began with the arrival of the European distant-water fleets in the early 1960's. Total international commercial landings (Northwest Atlantic Fisheries Organization Subareas 2-6,) peaked at 437,000 mt in 1973 and then declined sharply to 77,000 by 1977 (Overholtz 1989). The MSA established control of the portion of the mackerel fishery occurring in US waters (Northwest Atlantic Fisheries Organization Subareas 5-6) under the auspices of the Council. Reported foreign landings in US waters declined from an unregulated level of 385,000 mt in 1972 to less than 400 mt from 1978-1980 under the MSA (the foreign mackerel fishery was restricted by NOAA Foreign Fishing regulations to certain areas or "windows." Under the MSB FMP foreign mackerel catches were permitted to increase gradually to 15,000 mt in 1984 and then to a peak of almost 43,000 mt in 1988 before being phased out again.

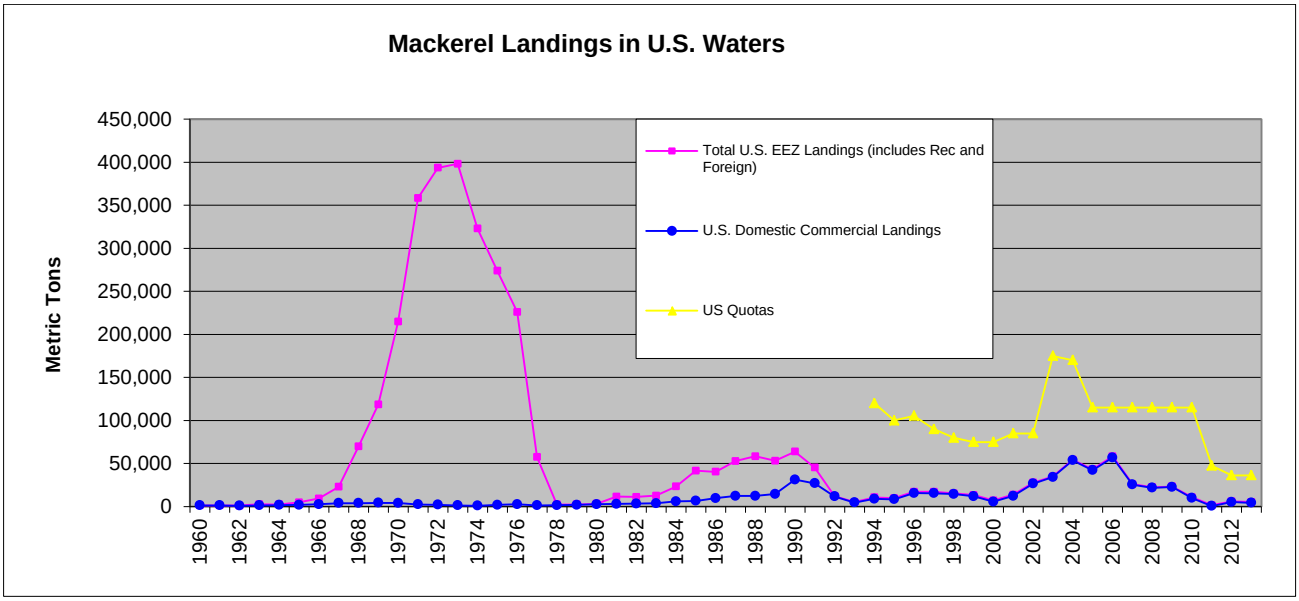

Figure 2. Historical Atl. Mackerel Landings in the U.S. EEZ.

US commercial landings of mackerel increased steadily from roughly 3000 mt in the early 1980s to greater than 31,000 mt by 1990. US mackerel landings declined to relatively low levels 1992-2000 before increasing in the early 2000's. The most recent years have seen a significant drop-off in harvest. The mackerel fishery usually catches 95% of its mackerel by May 1 so while incomplete, available 2014 data suggests that around 3,500-4,500 mt will be landed in 2014.

Nominally ex-vessel price has generally varied between about $200-$700 per mt but when inflation is taken into account there was erosion in the ex-vessel per-pound value of mackerel from 1982-2010. 2011 and 2012 prices increased substantially (near $700/mt), which is likely at least partially related to the low levels of mackerel landed. 2013 ex-vessel prices were about $436/mt. Total ex-vessel value tracks both price and the quantity of fish landed (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2013 landings totaled 4,372 mt and generated $1.9 million in ex-vessel revenues.

Fishery Performance

Weekly dealer data triggers in-season management actions that institute relatively low trip limits when 90% of the commercial DAH is landed. The table below lists the performance of the mackerel fishery (commercial and recreational together) compared to the effective quota for the last 10 years. There have been no quota overages over this period, but the fisheries have not approached the quotas. Since 2012 any ABC overages must be repaid pound for pound. Discard information is not available since 2011, but it does not appear that mackerel would have approached anywhere near its ABC since discards are usually quite low according to the most recent assessment (TRAC 2010). The 2013 ABC was 43,781 mt, which is also the ABC for 2014.

Table 21. Mackerel Quota Performance. (mt)

Year	Harvest (mt) (Commercial and Recreational)	Quota (mt) (Rec+Com)	Percent of Quota Landed
2004	54,298	170,000	32%
2005	43,275	115,000	38%
2006	58,352	115,000	51%
2007	26,142	115,000	23%
2008	22,498	115,000	20%
2009	23,235	115,000	20%
2010	10,739	115,000	9%
2011	1,478	47,395	3%
2012	6,015	36,264	17%
2013	5,261	36,264	15%

Source: Unpublished NMFS dealer reports and MRIP data

Participation in the fishery was low in 2013 related to the low availability of mackerel. The tables and figures below and on the following pages describe vessel participation, vessel dependency, distribution of landings by state/month/gear/port, dealer participation, and the general at-sea location of recent mackerel landings/catches.

Table 22. 2013 Data for Permitted and Active Vessels

Principal Port State (from permit data)	1,000,000 or more pounds	100,000-1,000,000 pounds	50,000-100,000 pounds	10,000-50,000 pounds
All States	4	3	3	13

Source: Unpublished NMFS dealer reports and permit data. Data confidentiality rules do not allow state by state breakdowns.

The mackerel fishery became a limited access fishery in 2013 except for open-access incidental catch permits. The current numbers of permits are 32 Tier 1 permits, 24 Tier 2 permits, and 90 Tier 3 permits. When the directed fishery is open, there are no trip limits for Tier 1, Tier 2 has a 135,000 pound trip limit and Tier 3 has a 100,000 pound trip limit. Tier 3's trip limit is reduced to 20,000

pounds if it catches 7% of the commercial quota. Open access incidental permits have a 20,000 pound per trip limit. Only a few vessels accounted for most mackerel landings in 2013 (see table above).

Table 23. 2013 Vessel Dependence on Mackerel (revenue-based)
Source: Unpublished NMFS dealer reports – not at state level due to data confidentiality issues

Dependence on Mackerel	Number of Vessels in Each Dependency Category
1%-5%	23
5%-25%	13
25%-50%	4
More than 50%	5

Table 24. Recent Landings by State (mt)
Source: Unpublished NMFS dealer reports

YEAR	CT	MA	MD	ME	NA	NC	NH	NJ	NY	RI
2011	17	234	0	90	5	3	0	48	60	73
2012	4	1,874	0	19	1	1	0	915	25	2,493
2013	9	3,302	0	465	2	0	3	21	9	562

Table 25. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	22	91	131	113	35	13	56	1	14	4	18	33
2012	668	3,576	948	19	48	4	5	1	35	18	5	4
2013	109	2,075	1,149	148	26	9	29	28	21	23	33	723

Source: Unpublished NMFS dealer reports

Table 26. Recent Landings by Gear (mt)

YEAR	Gill Nets	Bottom Trawl	Single Mid-Water Trawl	Pair Mid-Water Trawl	Trap/Pots/Pound Nets/Weir	Other/ Unknown
2011	27	327	69	72	5	30
2012	4	3,059	576	1,488	24	181
2013	6	965	166	2,338	15	883

Source: Unpublished NMFS dealer reports

Because of data confidentiality issues, details for port revenues from mackerel cannot be provided. Ports that had at least $100,000 in ex-vessel revenues from mackerel over 2011-2013 (combined) included (from more mackerel dollars to less): North Kingstown, RI; Gloucester, MA; New Bedford, MA; Cape May, NJ; Portland, ME, and Point Judith, RI. (*Source: Unpublished NMFS dealer reports.)*

Table 27. Recent Numbers of Active Dealers

	Number of dealers buying at least $10,000 Mackerel	Number of dealers buying at least $100,000 Mackerel
2011	13	0
2012	5	5
2013	16	4

Source: Unpublished NMFS dealer reports

Table 28. Kept Catch (mt) in Statistical areas with at least 1,000 mt of mackerel caught in at least one recent year

YEAR	_612	_521	_616	_522
2011	4	.	100	13
2012	2,393	38	1,527	45
2013	15	2,010	.	1,511

Source: Unpublished NMFS vessel trip reports

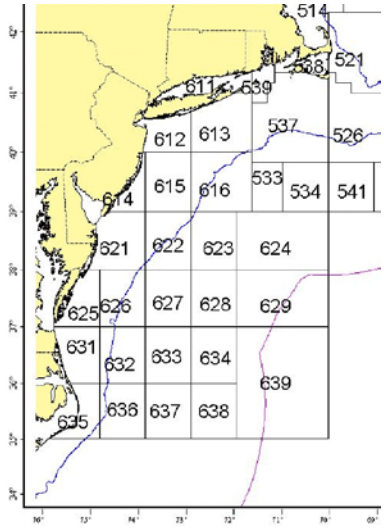

Figure 3. NMFS Statistical Areas

Current Market Overview for Mackerel and World Production (Required by FMP)

U.S. mackerel (western Atlantic) are a substitute for European mackerel (eastern Atlantic), which are caught in much larger quantities. It is unclear how demand for U.S. mackerel may be impacted by European catches, but the MSB advisory panel has indicated that the demand for mackerel is high enough to support catches near the quotas if the product is of high quality.

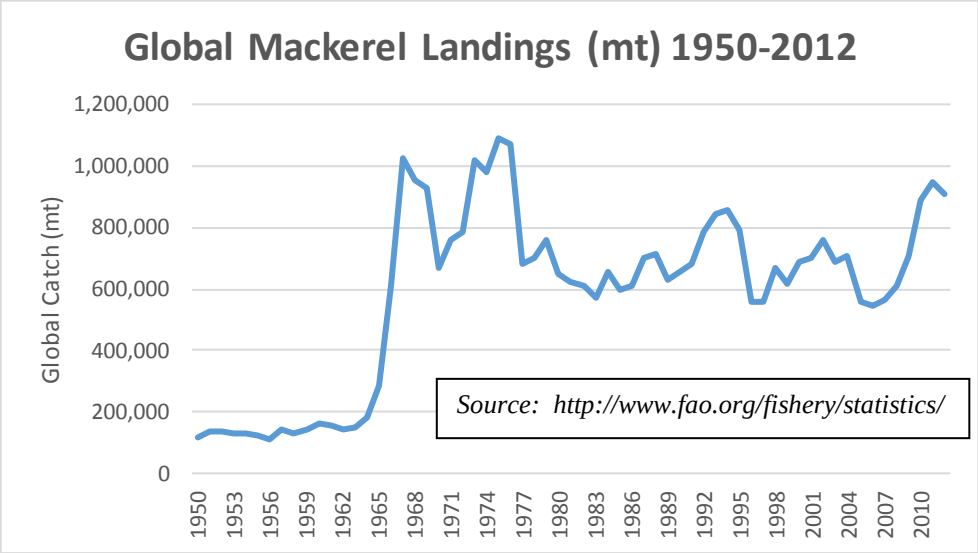

Figure 4. World production of Mackerel, 1950-2011.

Recreational Fishery

Mackerel can be seasonally important to the recreational fisheries of the Mid-Atlantic and New England regions. They may be available to recreational anglers in the Mid-Atlantic primarily during the winter and spring, depending on annual conditions. Mackerel are caught in New England in the summer and fall and are often targeted for purposes of collecting live bait, especially for large striped bass. 2004-2013 recreational landings of mackerel, as estimated from the Marine Recreational Information Program ("MRIP"), are given in the table below. Most mackerel are caught in the private/rental mode but some are caught in the party/charter and shore modes as well. Approximately 10% of all mackerel caught (by number) are released. Compared to other recreationally-important species, estimates for mackerel recreational harvest have low precisions due to low encounter rates. Earlier years (1980s-1991) had higher catches (consistently in the 1,000-4,000 mt range) but most recent years have been below 1,000 mt.

Table 29. Recreational Harvest (rounded to nearest mt) of Mackerel, 2004-2013.

Year	Harvest (MT)
2004	465
2005	1,005
2006	1,491
2007	596
2008	755
2009	600
2010	845
2011	947
2012	683
2013	895

Source: Personal communication from NMFS, Fisheries Statistics Division.

6.6.3 *Illex* Squid

Historical Commercial Fishery

Foreign fishing fleets became interested in exploitation of the neritic squid stocks of the Northwest Atlantic Ocean when the USSR first reported squid bycatches in the mid-1960's. By 1972, foreign fishing fleets reported landing 17,200 thousand mt of *Illex* from Cape Hatteras to the Gulf of Maine. During the period 1973-1982, foreign landings of *Illex* in US waters averaged about 18,000 mt, while US fisherman averaged only slightly more than 1,100 mt per year. Foreign landings from 1983-1986 were part of the US joint venture fishery which ended in 1987 (NMFS 1994a). The domestic fishery for *Illex* increased fitfully during the 1980's as foreign fishing was eliminated in the US EEZ. *Illex* landings are heavily influenced by year-to-year availability and world-market activity.

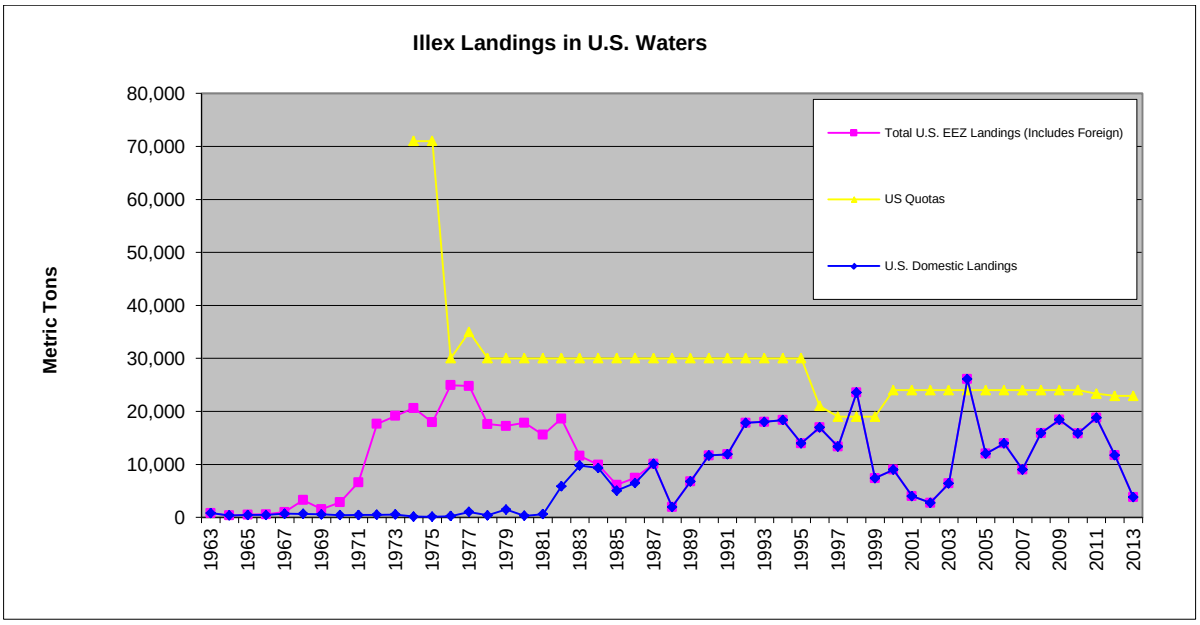

Figure 5. Historical *Illex* Landings in the U.S. EEZ.

Nominally ex-vessel price has increased from $200-$500 per metric ton in the 1980s $600-$1,000 per mt in recent years. In inflation adjusted dollars prices have varied from $600-$1,000 per mt without trend. 2013 ex-vessel prices were about $610/mt. Total ex-vessel value tracks both price and the quantity of fish landed (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2013 landings totaled 3,835 mt and generated $2.3 million in ex-vessel revenues.

Fishery Performance

The principle measure used to manage *Illex* is monitoring via dealer weighout data that is submitted weekly. The dealer data triggers in-season management actions that institute relatively low trip limits when 95% of the DAH is landed. The table below lists the performance of the *Illex* fishery compared to its DAH. There was an overage in 1 of the last 10 years (a 9% overage in 2004). NMFS is continually augmenting its projecting procedures so presumably future overages would be even less likely.

Table 30. *Illex* Quota Performance (mt)

Year	Landings	Quota	Percent of Quota Landed
2003	6,391	24,000	27%
2004	26,097	24,000	109%
2005	12,011	24,000	50%
2006	13,944	24,000	58%
2007	9,022	24,000	38%
2008	15,900	24,000	66%
2009	18,418	24,000	77%
2010	15,825	24,000	66%
2011	18,797	23,328	81%
2012	11,709	22,915	51%
2013	3,835	22,915	17%

Source: Unpublished NMFS dealer reports and MRIP data

Table 31. 2013 Data for Permitted and Active Vessels

Principal Port State (from permit data)	1,000,000 or more pounds	100,000-1,000,000 pounds	50,000-100,000 pounds	10,000-50,000 pounds
All States	3	6	3	5

Source: Unpublished NMFS dealer reports and permit data. Data confidentiality rules do not allow state by state breakdowns.

The *Illex* fishery is a limited access fishery with 74 current permits except for open access incidental permits. As long as the fishery is open there is no trip limit for moratorium permits - open access incidental permits have a 20,000 pound per trip limit. Only a few vessels accounted for most *Illex* landings in 2013 (see table above). Landings are usually provided by state but since there are few dealers that buy *Illex*, confidentiality rules do not allow precise descriptions. However, it can be reported that most *Illex* landings occur in New Jersey and Rhode Island.

Table 32. 2013 Vessel Dependence on Illex (revenue-based)
Source: Unpublished NMFS dealer reports – not at state level due to data confidentiality issues

Dependence on Mackerel	Number of Vessels in Each Dependency Category
1%-5%	9
5%-25%	5
25%-50%	2
More than 50%	0

Table 33. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	97	54	125	42	829	6,099	6,088	2,786	2,351	325	0	1
2012	1	6	22	79	8	1,706	2,463	2,730	3,575	1,113	1	7
2013	0	0	0	.	11	73	1,284	1,655	519	119	65	65

Source: Unpublished NMFS dealer reports

Table 34. Recent Landings by Gear (mt)

YEAR	Bottom Trawl	Mid-Water Trawl	Other/ Unknown
2011	18,192	486	118
2012	11,390	319	0
2013	3,597	5	190

Source: Unpublished NMFS dealer reports

Because of data confidentiality issues, details for port revenues from mackerel cannot be provided. Ports that had at least $100,000 in ex-vessel revenues from *Illex* over 2011-2013 (combined) included (from more mackerel dollars to less): North Kingstown, RI; May, NJ; Hampton, VA; and Wanchese, NC. (*Source: Unpublished NMFS dealer reports.)*

Table 35. Recent Numbers of Active Dealers

	Number of dealers buying at least $10,000 Illex	Number of dealers buying at least $100,000 Illex
2011	2	3
2012	2	2
2013	2	3

Source: Unpublished NMFS dealer reports

Table 36. Kept Catch (mt) in Statistical areas with at least 1,000 mt of mackerel caught in at least one recent year

YEAR	_622	_632	_626	_611
2011	11,187	2,974	1,888	1,034
2012	4,583	2,959	4,104	.
2013	1,986	1,001	556	.

Source: Unpublished NMFS vessel trip reports

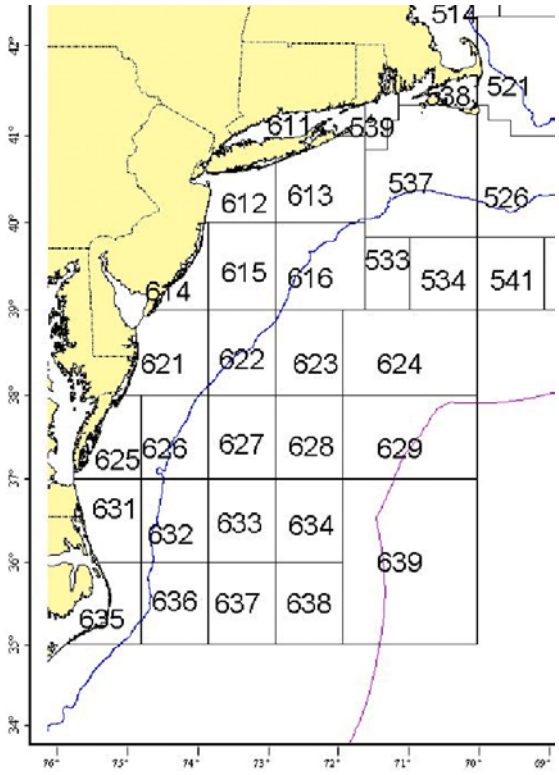

Figure 6. NMFS Statistical Areas

6.6.4 Atlantic butterfish

Historical Commercial Fishery

Atlantic butterfish were landed exclusively by US fishermen from the late 1800's (when formal record keeping began) until 1962 (Murawski and Waring 1979). Reported landings averaged about 3,000 mt from 1920-1962 (Waring 1975). Beginning in 1963, vessels from Japan, Poland and the Union of Soviet Socialist Republics began to exploit butterfish along the edge of the continental shelf during the late-autumn through early spring. Reported foreign catches of butterfish increased from 750 mt in 1965 to 15,000 mt in 1969, and then to about 32,000 mt in 1973. With the advent of extended jurisdiction in US waters, reported foreign catches declined sharply from 14,000 mt in 1976 to 2,000 mt in 1978. Foreign landings were completely phased out by 1987.

During the period 1965-1976, US Atlantic butterfish landings averaged 2,051 mt. From 1977-1987, average US landings doubled to 5,252 mt, with a historical peak of slightly less than 12,000 mt landed in 1984. Since then US landings have declined sharply. Low abundance and reductions in Japanese demand for butterfish probably had a negative effect on butterfish landings in the 1990s-early 2000s but regulations kept butterfish catches low from 2005-2012. Quotas were increased somewhat in each year 2012-2014. While the year is incomplete, several vessels did successfully target butterfish in early 2014.

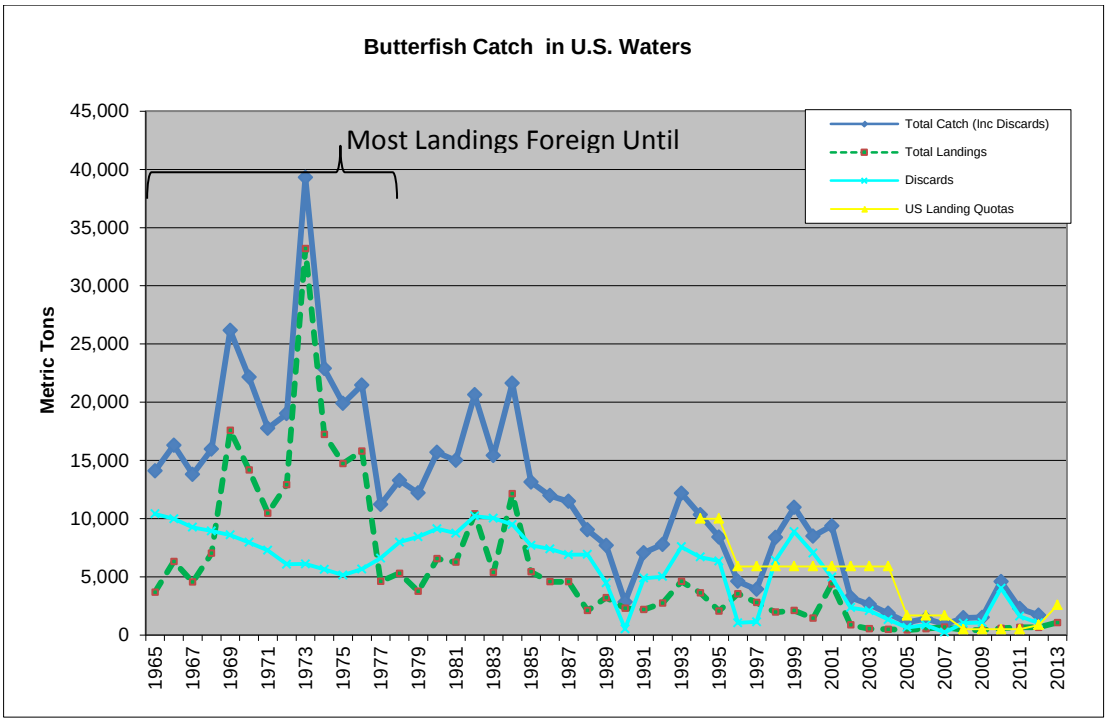

Figure 7. Historical Butterfish Landings in the U.S. EEZ

Price (nominal) has increased fitfully since 1982 to about $1481/mt in 2013, but taking inflation into account erodes most of that price increase (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2013 landings totaled 1074 mt and generated $1.6 million in ex-vessel revenues.

Fishery Performance

The principle measure used to manage butterfish landings is monitoring via dealer weighout data that is submitted weekly. The dealer data triggers in-season management actions that institute lower trip limits once various thresholds are crossed, as described in the alternatives for butterfish. The table below lists the performance of the butterfish fishery compared to the effective quota for the last 10 years. There were quota overages in 2010 and 2011. The causes of these are likely the increased butterfish abundance in recent years leading to early closures, as well as incomplete controls on state-permitted vessels. The long time period of incidental post-closure landings has resulted in the fishery ending up over its quota (the new closure system implemented in 2013 should correct this problem). There were ABC overages in 2009-2011 and ABC overages from 2012 on must be repaid. Additional buffering implemented in 2012 should avoid future ABC overages at current ABC levels, but if ABCs are lower in the future care will need to be exercised in order to avoid ABC overages.

Table 37. Butterfish Quota Performance (mt)

Year	Harvest (only commercial)	Quota	Percent of Quota Landed	ABC	Discards	Total Catch	Percent of ABC Caught
2004	497	5,900	8%		1,323	1,820	
2005	428	1,681	25%		647	1,075	
2006	555	1,681	33%		856	1,411	
2007	673	1,681	40%		239	918	
2008	451	500	90%		1,029	1,481	
2009	435	500	87%	1,500	1,079	1,514	101%
2010	607	500	121%	1,500	4,017	4,624	308%
2011	664	500	133%	1,811	1,612	2,276	126%
2012	640	872	73%	4,200	1,040	1,680	40%
2013	1,091	2,570	42%	8,400	NA	NA	NA
2009 was the first year that the SSC provided an ABC recommendation. 2011 was the first year of the butterfish cap, which directly controls most discards. Any ABC overages from 2012 on must be repaid pound for pound.							

Source: Unpublished NMFS dealer reports

The tables and figures on the following pages describe vessel participation, vessel dependency, distribution of landings by state/month/gear/port, dealer participation, and the general at-sea location of most recent catches.

Table 38. 2013 Data (most recent) for Permitted and Active Vessels

Principal Port State (from permit data)	50,000 pounds or more	10,000-50,000 pounds
All States	48	83

Source: Unpublished NMFS dealer reports and permit data. Data confidentiality rules do not allow state by state breakdowns.

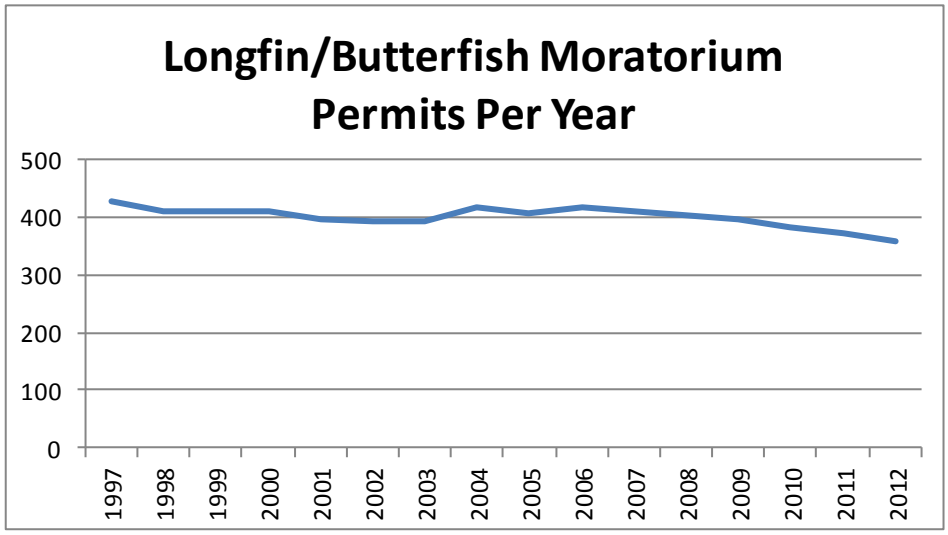

Figure 8. Longfin/Butterfish Moratorium Permits Per Year (Combination permit)
Source: Unpublished NMFS permit data.

Table 39. 2013 Vessel Dependence on Butterfish (revenue-based)

Dependence on Butterfish	Number of Vessels in Each Dependency Category
1%-5%	108
5%-25%	19
25%-50%	0
More than 50%	0

Source: Unpublished NMFS dealer reports. (Not at State Level to Avoid Confidentiality Issues)

Table 40. Recent Landings by State (mt)

YEAR	CT	DE	MA	MD	NA	NH	NJ	NY	RI
2011	48	low, but confidential	64	low, but confidential	4	low, but confidential	29	235	278
2012	51		80		14		34	207	249
2013	50		59		15		75	174	711

Source: Unpublished NMFS dealer reports

Table 41. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	54	40	55	63	97	100	31	25	60	54	47	38
2012	26	43	68	43	70	58	58	56	51	66	64	36
2013	32	125	49	122	58	45	64	97	85	87	150	176

Source: Unpublished NMFS dealer reports

Table 42. Recent Landings by Gear (mt)

YEAR	Bottom Trawl	Dredge	Unknown/ Other
2011	452	27	185
2012	456	20	163
2013	940	14	137

Source: Unpublished NMFS dealer reports

Table 43. Recent Butterfish Ex-Vessel Revenues by Port for All Ports with at least $100,000 butterfish ex-vessel sales totaled over last three years.

YEAR	POINT JUDITH, RI	MONTAUK, NY	NORTH KINGSTOWN, RI	NEW BEDFORD, MA	HAMPTON BAYS, NY	STONINGTON, CT	AMAGANSETT, NY
2011	373,268	281,011	31,224	58,929	47,095	confidential	49,144
2012	302,847	231,844	27,466	75,764	59,724		35,268
2013	376,089	300,094	536,403	67,917	39,704		22,090

Source: Unpublished NMFS dealer reports. CI = Confidential Data

Table 44. Recent Numbers of Active Dealers

	Number of dealers selling at least $10,000 Butterfish	Number of dealers selling at least $50,000 Butterfish
2011	16	7
2012	13	6
2013	17	7

Source: Unpublished NMFS dealer reports

Table 45. Recent Kept Catch in Statistical Areas with catch of at least 100mt butterfish total combined 2011-2013.

YEAR	_537	_539	_611	_616	_526	_525	_613
2011	105	62	82	72	1	31	31
2012	103	71	59	37	.	31	44
2013	274	80	63	49	146	70	37

Source: Unpublished NMFS vessel trip reports

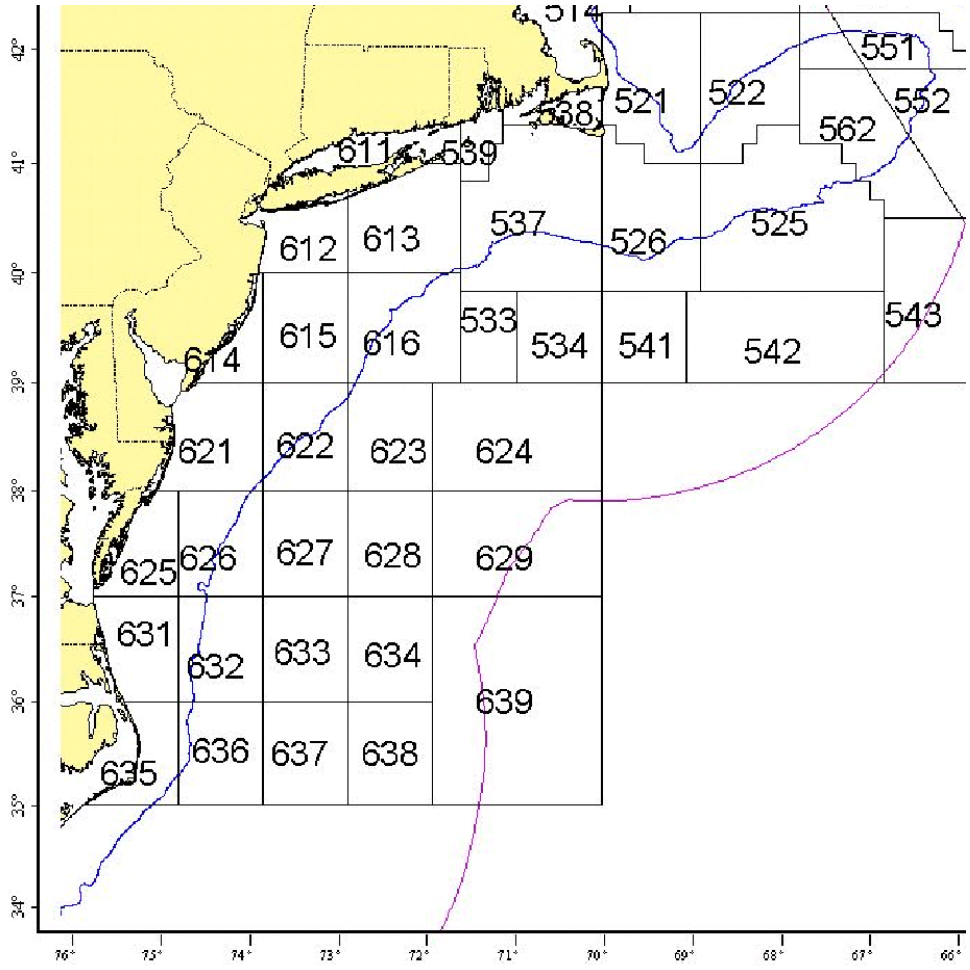

Figure 9. NMFS Statistical Areas.

6.6.5 Longfin Squid

Historical Commercial Fishery

US fishermen have been landing squid along east coast of the US since the 1880's (Kolator and Long 1978) but early fisheries were minor in scope. Focused effort began in 1968 by The Union of Soviet Socialist Republics and Japanese vessels. Reported foreign landings of longfin squid increased from 2000 mt in 1964 to a peak of 36,500 mt in 1973. Foreign longfin squid landings averaged 29,000 mt for the period 1972-1975.

Foreign fishing for longfin squid began to be regulated with the advent of extended fishery jurisdiction in the US in 1977. Initially, US regulations restricted foreign vessels fishing for squid (and other species) to certain areas and times (the so-called foreign fishing "windows"), primarily to reduce spatial conflicts with domestic fixed gear fishermen and minimize bycatch of non-target species. Later, foreign allocations were reduced and then eliminated as the domestic fishery became established. The development and expansion of the US squid fishery occurred relatively slowly as the US industry did not develop the appropriate technology to catch and process squid in offshore waters until the 1980's.

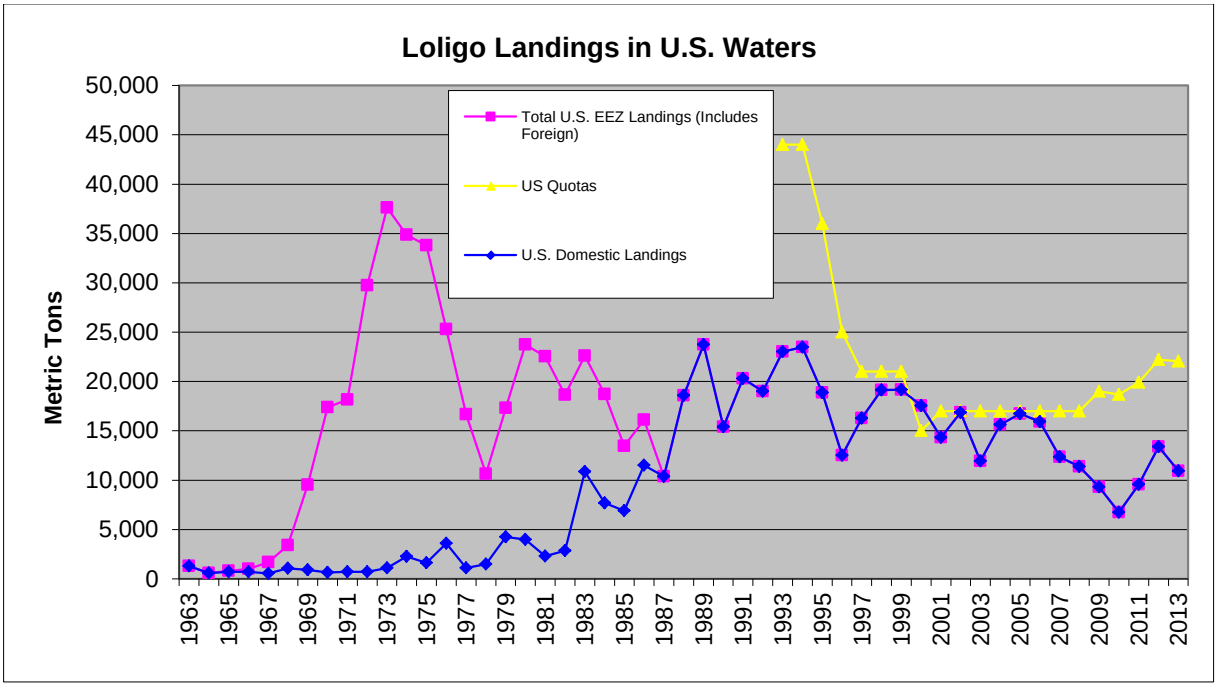

Figure 10. Historical Longfin Squid Landings in the U.S. EEZ.

Price has increased fairly steadily since 1982 to $2,365/mt in 2013, even taking inflation into account (see Fishery Information Document at http://www.mafmc.org/ssc-meetings/2013/april-may for details). 2013 landings totaled 10,940 mt and generated $25.9 million in ex-vessel revenues.

Fishery Performance

The principle measure used to manage longfin squid is Trimester quota monitoring via dealer data that is submitted weekly. The dealer data triggers in-season management actions that institute relatively low trip limits when 90% of the Trimester quotas are reached in Trimesters 1 and 2 and when 95% of the annual DAH is reached in Trimester 3. At the end of Trimester 1 and 2 the closure threshold increases to 95% as well to avoid short unnecessary closures. The percentages allocated to each Trimester are 43%, 17%, and 40%. Overages from Trimester 1 and 2 roll-over into Trimester 3, but it is more common to have underages. Underages from Trimester 1 roll into Trimester 3 if relatively small, but if underages are relatively large then ½ goes to Trimester 2 and ½ to Trimester 3. The most Trimester 2 can increase is 50% higher than the original Trimester 2 quota. Any underage in Trimester 2 rolls over into Trimester 3. The tables and figures on the subsequent pages describe quota performance, vessel participation, vessel dependency, distribution of landings by state/month/gear/port, dealer participation, and the general at-sea location of most recent catches.

The longfin squid DAH has been divided up into trimesters since 2007 while 2001-2006 had quarterly management. Each seasonal time period closes at a threshold of the seasonal allocation, which can result in seasonal closures. The seasonal closures that have occurred since 2002 are: **2002**: May 28-Jun30, Aug 16-Sep 30, Nov 2 -Dec 11, Dec 24-Dec31; **2003**: Mar 25-Mar 31; **2004**: Mar 5- Mar 31; **2005**: Feb 20-Mar 31, April 25-Jun 30, Dec 18-Dec 31; **2006**: Feb 13-Mar 31, April 21-April 26, May 23-June 30, Sept 2-Sept 30; **2007**: April 13-April 30; **2008**: July 17 - Aug 31; **2009**: Aug 6 - Aug 31; **2010**: No closures; **2011**: Aug 23 – Aug 31; **2012**: April 17 - April 30 (butterfish cap), July 10-August 31; **2013**: no closures. There are occasional overages of the trimester quotas, but these are typically minor and should have overall minimal effects since any Trimester 1 and 2 overages are applied to Trimester 3.

Table 46. Longfin Squid DAH Performance (mt)

Year	Commercial Landings	Quota	Percent of Quota Landed
2004	13,678	17,000	80%
2005	16,720	17,000	98%
2006	15,916	17,000	94%
2007	12,179	17,000	72%
2008	11,396	17,000	67%
2009	9,307	19,000	49%
2010	6,912	18,667	37%
2011	9,554	19,906	48%
2012	12,817	22,220	58%
2013	11,089	22,049	50%

Source: Unpublished NMFS dealer reports

Table 47. 2013 Data for Permitted and Active Vessels

Principal Port State (from permit data)	500,000 or more pounds	100,000-500,000 pounds	50,000-100,000 pounds	10,000-50,000 pounds
All States	10	56	20	37

Source: Unpublished NMFS dealer reports and permit data. Data confidentiality rules do not allow state by state breakdowns.

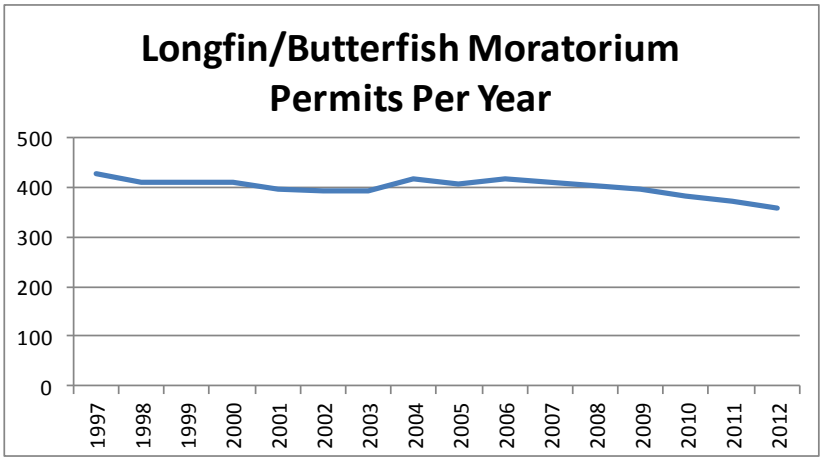

Figure 11. Longfin Squid/Butterfish Moratorium Permits Per Year (Combination permit)
Source: Unpublished NMFS permit data.

Table 48. 2013 Vessel Dependence on Longfin Squid (revenue-based)

Dependence on Longfin	Number of Vessels in Each Dependency Category
1%-5%	49
5%-25%	68
25%-50%	35
More than 50%	31

Source: Unpublished NMFS dealer reports Not at State Level to Avoid Confidentiality Issues

Table 49. Recent Landings by State (mt)

YEAR	CT	MA	MD	ME	NA	NC	NJ	NY	RI	NH
2011	226	639	1	0	34	11	1,591	2,553	4,498	.
2012	688	1,335	1	5	35	1	1,893	3,556	5,302	0
2013	487	393	0	0	154	0	2,169	2,172	5,712	0

Source: Unpublished NMFS dealer reports

Table 50. Recent Landings by Month (mt)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	1245	913	975	447	345	1011	2135	949	344	552	288	350
2012	342	348	672	1033	2058	2607	2395	876	766	1036	274	411
2013	438	75.6	176	61.4	109	313	827	1491	2735	2304	1635	924

Source: Unpublished NMFS dealer reports

Table 51. Recent Landings by Gear (mt)

YEAR	Bottom Trawl	Unknown	Midwater Trawl	Dredge	Trap/Pots/Pound/Weir	Other
2011	8,051	1,319	91	54	13	26
2012	10,879	1,621	99	131	48	40
2013	9,890	990	19	184	1	5

Source: Unpublished NMFS dealer reports

Table 52. Recent Longfin Squid Ex-Vessel Revenues by Port for All Ports with at Least $200,000 Longfin squid Ex-Vessel Sales Combined Over last three years

YEAR	POINT JUDITH, RI	MONTAUK, NY	CAPE MAY, NJ	HAMPTON BAYS, NY	NORTH KINGSTOWN, RI	NEW BEDFORD, MA	NEW LONDON, CT
2011	$8,206,277	$3,792,870	$2,932,800	$2,643,944	$2,321,291	$1,128,010	$141,030
2012	$10,661,735	$4,739,505	$3,666,660	$3,080,859	$1,837,346	$1,195,242	$998,311
2013	$9,842,003	$3,250,471	$4,390,149	$2,234,447	$3,251,086	$848,885	$725,914

YEAR	BARNSTABLE, MA	STONINGTON, CT	POINT LOOKOUT, NY	BELFORD, NJ	Woods Hole, MA	POINT PLEASANT, NJ	SHINNECOCK, NY
2011	CI	$360,612	$488,106	CI	CI	CI	CI
2012	CI	$689,303	$537,550	CI	CI	CI	CI
2013	CI	$403,915	$161,679	CI	CI	CI	CI

YEAR	NEWPORT, RI	HAMPTON, VA	FALMOUTH, MA	EAST LYME, CT
2011	CI	CI	CI	CI
2012	CI	CI	CI	CI
2013	CI	CI	CI	CI

Source: Unpublished NMFS dealer reports

Table 53. Recent Numbers of Active Dealers

	Number of dealers buying at least $10,000 longfin	Number of dealers buying at least $100,000 longfin	Number of dealers buying at least $1,000,000 longfin
2011	21	22	6
2012	20	25	8
2013	20	18	6

Source: Unpublished NMFS dealer reports

Table 54. Recent Catch in Statistical areas with at least 1000 mt of longfin squid caught total 2011-2013

YEAR	_616	_537	_622	_613	_612	_626	_526	_632	_539
2011	1,321	1,253	1,608	642	1,630	417	324	137	328
2012	1,419	2,522	1,244	1,704	1,765	385	12	130	421
2013	2,452	885	1,730	1,761	297	621	820	803	258

Source: Unpublished VTR reports

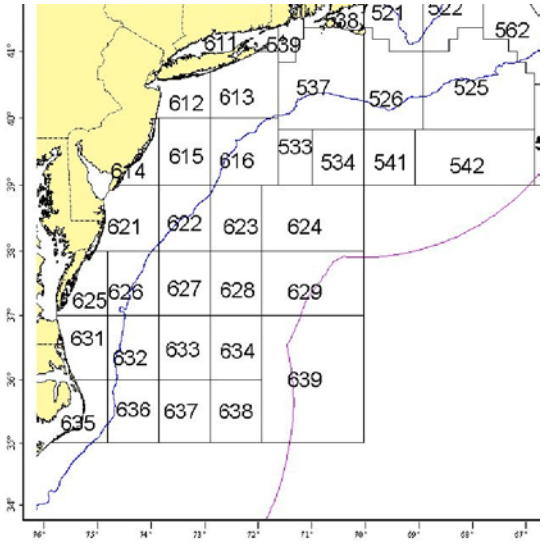

Figure 11. NMFS Statistical Areas

Butterfish Catch/Mortality Cap

The longfin squid fishery is subject to closure if it discards too much butterfish. Framework 7 modified the cap to be a discard cap versus catch cap but the effect remained unchanged - butterfish mortality in the longfin squid fishery should be controlled. Because of the butterfish cap, a constraint on total butterfish catch may limit production in the squid fishery, so butterfish takes on a "shadow value" in terms of the indirect impact on the longfin squid fishery. While the exact relationship between butterfish and longfin squid catches cannot be precisely determined ahead of time for any

given year, the "shadow value" of butterfish could be quite large; that is, the longfin squid fishery may recognize large increases in landings/revenues/profits from relatively small increases in the butterfish specifications (and vice-versa with decreases).

The cap also is important for butterfish management. Since ACL overages of butterfish have to be paid back in following years, the cap serves to help limit annual butterfish mortality to a given amount established by the SSC, which should both protect the butterfish stock and avoid negative impacts related to large paybacks if discarding was not monitored and controlled in each year in near real-time.

There were no cap closures in 2011. In 2012 there was a closure from April 17-30, although late-arriving data caused the closure rather than actual discards. There were no closures in 2013. Additional details on the cap estimation may be found here: http://www.nero.noaa.gov/nero/regs/frdoc/11/11SMB2011ButterfishSpecsRevisedCAP.pdf and a report on the 2011 operation of the cap may be found here: http://www.mafmc.org/meeting_materials/SSC/2012-05/SSC_2012_05.htm. Review of the cap's 2011 operation by the SSC in May 2012 found that the cap appears to be operating as designed, i.e. tracking and limiting butterfish mortality in the longfin squid fishery. It did also find that non-cap mortality also needs to be sufficiently accounted for to avoid ABC overages. As described in Section 5 of this document, the proposed butterfish specifications do account for non-cap mortality. Review of the cap's 2012-2013 operation found that there were no cap overages and an in-depth review is pending.

Longfin Squid Recreational Fishery

While there is definitely a recreational fishery for longfin squid, catch amounts have not been estimated – MRIP does not collect information on invertebrates. Based on qualitative research by Council staff, recreational fishing primarily occurs in the following modes: fishing from shore on manmade structures with artificial lighting at night; private boat fishing, charter boat fishing, and party/head boat fishing. Once the new MRIP methodology is fully in place (2015) the Council may request that additional information on squid catches be collected by MRIP interviewers or the Council may investigate a separate survey. If individuals are looking for qualitative information on recreational squid fishing, the following site contains a variety of anecdotal information on recreational longfin squid fishing: http://www.squidfish.net/forums/index.php?/forum/18-east-coast/.

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

The alternatives considered are fully described in section 5. Related to the specifications, the key determinant of biological impact on the managed resources is how much fish can be caught, i.e. the annual catch limits in the case of butterfish and mackerel and the ABCs for longfin and *Illex* squid (the squids are exempt from ACLs due to their short lifespan). In recent years the mackerel, longfin squid, and *Illex* fisheries have not caught their entire quotas. Thus even the no action/status quo potentially allows an expansion of catch. To the degree that extra effort is used to expand catch, impacts on non-target species, habitat, and protected resources could increase even under the no action. Conversely, for the same reasons that catch has been lower than the quotas, catch and effort, and related impacts, could decrease under the no action. Rather than repeat this concept for every resource, this document acknowledges that under any of the proposed alternatives effort and related impacts could increase or decrease for reasons other than the specifications. Accordingly, the focus of analysis is on the relative upper limits imposed by the various specifications.

For habitat, protected resource, and non-target species impacts, the key determinant is not so much the catch itself but the amount and character of the related effort. A decrease in effort may result in positive impacts (+) as a result of fewer encounters and/or fewer habitat impacts from fishing gear, while an increase in effort may result in a negative impact (-). Similar effort likely results in neutral impacts (0). Table 55 (below) illustrates that the availability of the target species can drive effort as much as any quota change, and as effort changes so would impacts on habitat, protected resource, and non-target species. This is noted for the habitat, protected resource, and non-target species sections since the MSB fisheries often experience large swings in availability and therefore effort independent of any regulatory changes.

Since limits on catch do cap effort, catch limits are a factor related to effort but many other factors at least somewhat beyond the control of the Council (such as fish abundance, availability of other opportunities, weather, climate, fish movements/availability, variable productivity, etc.) also affect how much and what sort of effort is utilized to land a given quantity of a given species of fish in any given year. Table 55 provides a general evaluation of how effort may change relative to changes in quota and fish abundance and/or availability, and highlights the complexity of predicting effort changes based on changes in management alone. This is especially true for the MSB species as they are subject to sometimes rapid fluctuations in abundance (how many fish are out there) and/or availability (how many fish are out there in places where the fishery can find and target them profitably).

Note on research set-asides (RSA): RSA is part of the overall specifications for each species. With the exception of possession limits and quota closures, the RSA quota would be harvested in approximately the same manner as the commercial fishery. Therefore, it is unlikely that the pursuit of fish under any RSA project or RSA compensation fishing would have negative impacts on any part of the ecosystem compared to if the quota had been utilized by the general directed fishery, since differences in how an RSA project uses the quota compared to the directed fishery are likely to be minor. Also, RSA projects usually test gears, survey approaches, and other projects that are hypothesized to improve the condition of the ecosystem, so any impacts are likely to be neutral to positive. If any portion of the 3-percent RSA quota of MSB species is not awarded to an RSA project, the remainder will be returned to

the general fishery. Further, because MSB catch has generally been below quotas recently, the only fishery likely to have RSA requested is longfin squid. Finally, the RSA program has been suspended by the Council pending further review of its overall utility, so it is unlikely that any RSA quota will be utilized. As such, RSA is not further discussed in the context of this environmental assessment except at the beginning of the human community sections.

Table 55. Changes in effort as a result of adjustments to quota and/or fish availability.

Change in quota	Fish abundance/availability		
	Decrease in availability	**No change in availability**	**Increase in availability**
Decrease in quota	Fishing effort may decrease, increase, or stay the same depending on a combination of factors.	Effort likely to decrease or stay the same. If per trip catch stays the same, the fishery will be closed earlier with fewer trips taken (reducing effort). However managers may reduce trip limits or adjust regulations that extend the fishing season (keeping effort the same).	Effort likely to decrease or stay the same. A lower quota plus higher catch per unit of effort (CPUE) from higher availability should decrease effort. However, managers may reduce trip limits or adjust regulations that extend the fishing season which may keep effort relatively even.
No change in quota	Effort may increase or decrease. While the quota has not changed, fishermen may try to take more trips to catch the same amount of fish (increasing effort) or may stop targeting a stock of fish if availability is low enough to decrease profitability (decreasing effort).	Fishing effort may remain the same given the quota has not changed and availability is expected to be similar.	Effort should decrease. While the quota has not changed, fishermen should be able to take fewer trips to catch the same amount of fish (decreasing effort).
Increase in quota	Fishing effort likely to increase or stay the same. A higher quota plus lower catch per unit of effort from lower availability should increase effort. However, managers may increase trip limits or adjust regulations to allow more efficient fishing (keeping effort the same).	Effort likely to increase or stay the same. If per trip catch stays the same, the fishery will be closed later with more trips taken (increasing effort). However managers may increase trip limits or adjust regulations to allow more efficient fishing (keeping effort the same).	Fishing effort may decrease, increase, or stay the same depending on a combination of factors.

7.1 Biological Impacts on Managed Species

The impacts from the alternatives are described separately for each of the managed species: mackerel (7.1.1), butterfish (7.1.2), longfin squid (7.1.3), and *Illex* squid (7.1.4). Any amount of fishing will lower the population of a fish stock, but in the context of fishery management, a negative impact would be something that causes a population to go below target levels, which are generally near the biomass that produces maximum sustainable yield.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - No Action/status-quo for 2015 mackerel specifications
1b (Preferred) - 2015 mackerel specifications based on long-term median
1c - 2015 mackerel specifications based on 1992-2001 average catch
2a - No Action/status-quo for 2015 RH/S cap (236 mt)
2b (Preferred) - Two-phase 89 mt/155 mt 2015 RH/S cap
2c - 155 MT metric tons (mt) 2015 RH/S cap
3a (Preferred) - New 3-year *Illex* specifications (2015-2017) at same level as current, which also would be no action/status-quo
3b - ABC 25% higher than preferred for 2015-2017 *Illex* specifications
3c - ABC 25% lower than preferred for 2015-2017 *Illex* specifications
4a - No Action/status quo for 2015 butterfish specifications
4b (Preferred) - New 3-year butterfish specifications (2015-2017) based on new assessment
4c - Stepped increases for new 3-year butterfish specifications (2015-2017)
5a (Preferred) - New 3-year longfin squid specifications (2015-2017) at same level as current, which also would be no action/status-quo
5b - ABC 25% higher than preferred for 2015-2017 longfin squid specifications
5c - ABC 25% lower than preferred for 2015-2017 longfin squid specifications

7.1.1 Impacts on Mackerel

Alternative Set 1 –Mackerel Specifications

There is no quantitative information available to evaluate the mackerel specification alternatives. There is concern about the mackerel fishery and indications of reduced productivity related to low catches in recent years (TRAC 2010). Possible explanations include: a) mackerel have moved away from traditional fishing grounds (as has occurred in Europe), b) environmental conditions have resulted in a less productive or less fishable stock, or c) the stock is overfished. A combination of these factors could also be possible. Given the concern about the status of the mackerel stock, maintaining the no action (status quo) quotas could continue negative impacts if the quotas are too high. Lower catches should be more protective of the mackerel stock, so compared to the no action, the preferred alternative 1b (40,165 mt ABC) should have positive impacts as should 1c (33,400 mt ABC). 1c would be most protective (lowest ABC) and thus have the largest positive impacts. However, since actual mackerel catches have been below all of these options in recent years, the benefit of 1b or 1c is likely to be low compared to the no action or each other.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

Under the no action with a 236 mt RH/S cap (1a), U.S. mackerel landings have ranged from 1,484 mt to 6,083 mt over 2011-2013. Regardless of the RH/S cap's size and operation under the no action or action alternatives, mackerel catch is controlled by other measures and factors and should be limited to the acceptable biological catch. Thus impacts on the mackerel stock because of the RH/S cap should be low regardless if the cap is set higher or lower since mackerel is still managed with its own specifications. The RH/S cap may limit mackerel catches if the mackerel fishery is closed because of the cap. Lower caps could potentially result in lower mackerel landings, in order from most landings allowed to least of 2a - no action – 236 mt, 2c – 155 mt, 2b – two-phase 89mt/155mt. Lower mackerel catches than the ABC should be more protective of the mackerel stock but the differences are not possible to quantify. Also, external environmental drivers appear to be very important for mackerel abundance and distribution (TRAC 2010). This is consistent with Amendment 14, which found that if the mackerel fishery is closed because of the cap, mackerel catches would be lower than would otherwise occur, but are already managed separately. In any case, the no action (status quo) should have low positive impacts on the mackerel stock because it still has the potential to halt mackerel landings before the mackerel quota is reach if river herring/shad catch is high enough to trigger the 236 mt limit. Since lower caps could potentially lead to lower mackerel catches, they could also be more protective of the mackerel stock. Compared to the no action, the preferred alternative 2b should have positive impacts as should 2c. 2b would be most protective (lowest cap) and thus have the largest positive impacts. However, since mackerel catches have been very low in recent years, the benefit of 2b or 2c is likely to be low compared to no action/status quo (at low mackerel catches the cap is not likely to be binding).

Alternative Set 3 –*Illex* Specifications

The *Illex* specifications should not have any impacts on the mackerel fishery or mackerel stock since these are generally unrelated fisheries. Thus all of these alternatives, no action or action, should have negligible impacts on mackerel.

Alternative Set 4 – Butterfish Specifications

The butterfish specifications should not have any impacts on the mackerel fishery or mackerel stock since these are mostly unrelated fisheries. There is likely to be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence. Thus all of these alternatives, no action or action, should have negligible impacts on mackerel.

Alternative Set 5 – Longfin Squid Specifications

The longfin squid specifications should not have any impacts on the mackerel fishery or mackerel stock since these are mostly unrelated fisheries. There is likely to be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence. Thus all of these alternatives, no action or action, should have negligible impacts on mackerel.

7.1.2 Impacts on Butterfish

Alternative Set 1 –Mackerel Specifications

The mackerel specifications should not have any impacts on the butterfish fishery or butterfish stock since these are mostly unrelated fisheries. There is likely to be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence. The butterfish specifications also leave some quota unallocated in order to anticipate discards in other fisheries and has an additional management uncertainty buffer. Thus all of these alternatives, no action or action, should have negligible impacts on butterfish.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

This alternative set is essentially an extension of the mackerel specifications. The mackerel specifications should not have any impacts on the butterfish fishery or butterfish stock since these are mostly unrelated fisheries. There is likely to be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence. The butterfish specifications also leave some quota unallocated in order to anticipate discards in other fisheries and has an additional management uncertainty buffer. Thus all of these alternatives, no action or action, should have negligible impacts on butterfish.

Alternative Set 3 –*Illex* Specifications

The *Illex* specifications should not have any impacts on the butterfish fishery or butterfish stock since these are mostly unrelated fisheries. There is likely to be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence. The butterfish specifications also leave some quota unallocated in order to anticipate discards in other fisheries and has an additional management uncertainty buffer. Thus all of these alternatives, no action or action, should have negligible impacts on butterfish.

Alternative Set 4 – Butterfish Specifications

All of the butterfish specifications (no action and action alternatives) should lead to catches that are well below the butterfish overfishing threshold (NEFSC 2014 – SARC 58) due to the scientific and management uncertainty buffers incorporated into the specifications. The specifications also account for butterfish discards in a redeveloped butterfish fishery, and other fisheries, and directly limit discards in the longfin squid fishery through a cap. Compared to the no action alternative, the action alternatives could allow catches that would make the butterfish stock slightly smaller, but still keep it above the biomass target. Thus all of these alternatives, no action or action, should have negligible impacts on butterfish.

Alternative Set 5 – Longfin Squid Specifications

The longfin squid fishery does catch substantial quantities of butterfish (see Section 6.5). The longfin squid specifications should not have any impacts on the butterfish fishery or butterfish stock however since all butterfish alternatives (Set 4) maintain the same butterfish discard cap (3,884 mt), and even if that cap is reached there should be no impacts on the butterfish stock given the overall ABC. Whether

longfin squid catches are kept constant (5a), raised (5b), or lowered (5c), no more than 3,884 mt of butterfish should be discarded in the longfin squid fishery (the longfin squid fishery is closed when it approaches 3,884 mt of butterfish discards). Since the butterfish specifications set aside 3,884 mt of butterfish for the cap, and since the butterfish specifications are overall designed to avoid adverse impacts to butterfish, there should be no impacts for butterfish from the longfin squid specifications. Thus all of these alternatives, no action or action, should have negligible impacts on butterfish.

7.1.3 Impacts on Longfin Squid

Alternative Set 1 –Mackerel Specifications

The mackerel specifications should not have any impacts on the longfin squid fishery or longfin squid stock since these are mostly unrelated fisheries. There can be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence, and longfin squid landings are reduced to account for expected discards. Thus all of these alternatives, no action or action, should have negligible impacts on longfin squid.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

This alternative set is essentially an extension of the mackerel specifications. The mackerel specifications should not have any impacts on the longfin squid fishery or longfin squid stock since these are mostly unrelated fisheries. There can be some minor bycatch between these two fisheries (see Section 6.5), but not enough to be of consequence, and longfin squid landings are reduced to account for expected discards. Thus all of these alternatives, no action or action, should have negligible impacts on longfin squid.

Alternative Set 3 –*Illex* Specifications

The *Illex* specifications should not have any impacts on the longfin squid fishery or longfin squid stock since these are mostly separate fisheries. The *Illex* fishery does encounter longfin squid at certain times of the year (generally late summer and early fall), but is likely to retain longfin squid given its relatively high value (see Section 6.5). Retained catch would be counted against the longfin squid quota and would just cause the longfin squid fishery to close earlier and should not cause any ABC overages for longfin squid. Longfin squid landings are also reduced to account for expected discards. Thus all of these alternatives, no action or action, should have negligible impacts on longfin squid.

Alternative Set 4 – Butterfish Specifications

The butterfish specifications should not have any impacts on the longfin squid fishery or longfin squid stock. While butterfish fishing may catch longfin squid due to their general co-occurrence (see Amendment 10 to the MSB FMP for co-occurrence details), longfin squid that is caught is likely to be retained given its relatively high value. Retained catch would be counted against the longfin squid quota and would just cause the longfin squid fishery to close earlier and should not cause any ABC overages for longfin squid. Thus all of these alternatives, no action or action, should have negligible impacts on longfin squid.

Alternative Set 5 – Longfin Squid Specifications

The preferred alternative, 5a, which is also the no action alternative and would retain the status-quo, should produce negligible effects for the longfin squid stock - the 2010 longfin squid assessment found that catches at or below 23,400 are likely to be sustainable (NEFSC 2010 - SARC 49). The same would be true for 5c (reduced ABC). 5b could lead to catches higher than the 23,400 mt recommended by the Council's SSC and supported by the 2010 longfin squid assessment. Thus impacts are likely best characterized as "negative" for 5b compared to the other alternatives (which includes the no action/status quo/preferred).

7.1.4 Impacts on *Illex* Squid

Alternative Sets 1, 2, 4, and 5

The *Illex* squid fishery is sufficiently separate from the mackerel, longfin squid, and butterfish fisheries (Alternative Sets 1, 2, 4, and 5) that one would not expect any impacts to the *Illex* stock from any of the no action or action alternatives considered for those alternative sets. Even if there is incidental catch of *Illex* in these other fisheries (and there is some, especially in the longfin squid fishery in the summer and fall), because direct controls on the *Illex* squid fishery and a set-aside for discards exist, *Illex* squid catches should stay below the *Illex* ABC regardless, so equally negligible impacts would be expected for *Illex* squid related to any alternatives (including the no action) in the Alternative Sets 1, 2, 4, and 5.

Alternative Set 3 –*Illex* Specifications

The preferred alternative, 3a, which is also the no action alternative and would retain the status-quo, should produce negligible effects for the *Illex* squid stock – the SSC has determined that catches at or below 24,000 mt are likely to be sustainable (see Section 5). The same would be true for 3c (reduced ABC). 3b could lead to catches higher than the 24,000 mt recommended by the Council's SSC. Thus impacts are likely best characterized as "negative" for 3b compared to the other alternatives, including when compared to the no action/status quo/preferred.

Managed Species Impacts Summary

The no action/status quo alternatives should continue to be protective of the MSB stocks. Most of the action alternatives considered in this document should have no or similar impacts on the managed species relative to how the fishery would be conducted with the no action alternatives. There are only two exceptions. First, 3b (using an *Illex* ABC higher than that recommended by the SSC) may have a negative impact for the *Illex* stock compared to the no action and other action alternatives (by allowing too much *Illex* catch). Second, 5b (using a longfin squid ABC higher than that recommended by the SSC) may have a negative impact for the longfin squid stock compared to the no action and other action alternatives (by allowing too much longfin squid catch).

7.2 Habitat Impacts

As discussed in Table 55 at the start of Section 7, the availability of the targeted species may drive effort (and habitat impacts) as much as quotas and other regulations. Impacts on the habitat for the managed species (7.2.1) and other species (7.2.2) are addressed separately. The word "habitat" encompasses essential fish habitat (EFH) for the purposes of this analysis. The Council has already minimized to the extent practicable impacts to habitat from the MSB fisheries through closure of several canyon areas in MSB Amendment 9 (http://www.mafmc.org/fmp/history/smb-hist.htm) and Tilefish Amendment 1 (http://www.mafmc.org/fmp/history/tilefish.htm) (see Section 6.3). The Council is also considering protections for Deep Sea Corals via Amendment 16.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - No Action/status-quo for 2015 mackerel specifications
1b (Preferred) - 2015 mackerel specifications based on long-term median
1c - 2015 mackerel specifications based on 1992-2001 average catch
2a - No Action/status-quo for 2015 RH/S cap (236 mt)
2b (Preferred) - Two-phase 89 mt/155 mt 2015 RH/S cap
2c - 155 MT metric tons (mt) 2015 RH/S cap
3a (Preferred) - New 3-year *Illex* specifications (2015-2017) at same level as current, which also would be no action/status-quo
3b - ABC 25% higher than preferred for 2015-2017 *Illex* specifications
3c - ABC 25% lower than preferred for 2015-2017 *Illex* specifications
4a - No Action/status quo for 2015 butterfish specifications
4b (Preferred) - New 3-year butterfish specifications (2015-2017) based on new assessment
4c - Stepped increases for new 3-year butterfish specifications (2015-2017)
5a (Preferred) - New 3-year longfin squid specifications (2015-2017) at same level as current, which also would be no action/status-quo
5b - ABC 25% higher than preferred for 2015-2017 longfin squid specifications
5c - ABC 25% lower than preferred for 2015-2017 longfin squid specifications

7.2.1 Impacts on Managed Species Habitat

Habitat for the managed species generally consists of the water column, which is not significantly impacted by fishing activity. The exception to the habitat location being the water column is longfin squid eggs, which are attached to sand, mud, or bottom structure (manmade or natural). However, as determined in Amendment 9, there is no indication that squid eggs are preferentially attached to substrates that are vulnerable to disturbance from fishing, so no impacts on habitat for longfin squid eggs are expected from any increase or decrease in fishing effort by bottom trawls. This means that the impacts for managed species' habitat related to any of the status quo alternatives are neutral, as are the impacts of any of the action alternatives. This is the same finding as was included in Amendment 14.

7.2.2 Impacts on Other Federally Managed Species Habitat (see table 17)

Alternative Set 1 –Mackerel Specifications

In recent years most substantial mackerel landings have been made with mid-water trawl gear, which should not impact habitat. Some mackerel may be targeted with bottom trawl gear however, which can impact habitat. The no action, being the status quo, thus should have minor negative impacts, similar to the previous year. Restricting catch could lower effort, so compared to no action (1a - 80,000 mt ABC), both the preferred 1b (40,165 mt ABC) and 1c (33,400 mt ABC) could be more protective of habitat and thus have positive impacts. However, since mackerel catches have been below all of these options in recent years, the benefit of 1b or 1c is likely to be low (i.e. the specifications will not be constraining) compared to no action or each other.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

In recent years most substantial mackerel landings have been made with mid-water trawl gear, which should not impact habitat. Some mackerel may be targeted with bottom trawl gear however, which can impact habitat. The no action alternative (2a – 236 mt cap) could limit mackerel effort depending on mackerel landings and RH/S encounter rates, so its impacts would be a continuing low positive. Compared to the no action, 2b and 2c would be predicted to have additional positive habitat impacts, with 2b having the most positive impact. Since most substantial mackerel landings in recent years have been with mid-water trawl, and since mackerel catches have been low in recent years, the positive impacts of 2b or 2c would likely be low (i.e. the specifications may not be constraining) compared to the no action or each other. Overall, both action alternatives 2b and 2c are thus likely to have a low positive habitat impact that is somewhat more positive than the no action.

Alternative Set 3 –*Illex* Specifications

Illex are taken almost exclusively by bottom otter trawls. Due to the year to year variation in catch and effort in the *Illex* fishery, it is difficult to quantify habitat impacts. Since under the no action/status quo/preferred alternative (3a) the effective catch limit would remain the same, impacts would be expected to be low negative (about the same as the previous fishing year and minimized to the extent practicable through previous actions – see Section 6.3). With 3b, since the effective catch limit would be higher than the status-quo, the impact of 3b as an implemented specification should be less protective, and thus have negative impacts compared to the no action or 3c. However, since catch has recently been below even the no action alternative's specifications, impacts may be similar to the prior fishing year. Given the above, for 3b overall habitat impacts are likely best characterized as "low negative" compared to the no action or 3c. With 3c, since the effective catch limit would be lower than the status-quo or 3b, the impact of 3c as an implemented specification should be more protective, and thus have positive impacts compared to the no action or 3b. However, since catch has also recently been below 3c's specifications, impacts may be similar to the prior fishing year. Given the above, for 3c overall habitat impacts are likely best characterized as "low positive" compared to the no action or 3b.

Alternative Set 4 – Butterfish Specifications

4a – No Action/status quo – ABC of 9,100 mt, landings of 3,200 mt, butterfish cap of 3,884 mt.

There is some directed fishing for butterfish currently, and bottom-tending mobile gear is utilized, which has the potential to impact seafloor habitat. Effort is likely to take place over sand/mud bottoms given sand/mud/rock bottoms are the preferred substrates for butterfish (see butterfish EFH Source Document, NMFS 1999, for details). Fishery participants using bottom-tending mobile gear will generally avoid rocky areas that cause gear damage unless catches would be higher over rocky areas, which is not known to be the case with butterfish. Since under the no action/status quo alternative (4a) the effective catch limit would remain the same, impacts would be expected to be low negative (about the same as the previous fishing year and minimized to the extent practicable through previous actions – see Section 6.3). The butterfish specifications also can limit longfin squid effort due to the butterfish cap. Longfin squid are caught in bottom trawls, which have the potential to adversely impact seafloor habitat (see Section 6.3 for how impacts have been mitigated). No changes to the butterfish cap are considered across the butterfish specifications so indirect butterfish-longfin impacts are not discussed further.

4b – preferred– ABCs over 3 years of about 32,000 mt; landings of about 22,000 mt, and a butterfish cap of 3,884 mt.
4c – stepped increases– ABCs over 3 years of about 16,000 mt, 24,000 mt, and 31,000 mt; landings of about 9,000 mt, 15,000 mt, and 21,000 mt, and a butterfish cap of 3,884 mt.
(Both 4b and 4c are higher than the no action and are treated together.)

The potential landings increases that are part of 4b and 4c could increase butterfish effort compared to the no action. 4b could increase landings by about 19,000 mt and 4c does basically the same thing just over 3 years, so the long term habitat impacts if these specifications were implemented are approximately the same and can be discussed together focused on an increase of about 19,000 mt of butterfish landings.

In terms of habitat impacts, the key is how the increased quota translates into total additional directed fishing effort from bottom trawling. Given the lack of a directed fishery in recent years, the best source of information on this topic comes from industry contacts. According to industry contacts, there are two kinds of vessels that may increase fishing for butterfish. One kind is the large freezer vessels. In 2001, the last year of substantial directed butterfish fishing, it only took the 10 largest trips by just two vessels to catch 2,214 mt (an average of 221 mt per trip). 19,000 mt could translate into around 80-90 directed trips at an average of around 221 mt. The other kind of vessel (which have not been active participants) would only be landing around 30-40 mt per trip, which could theoretically translate into approximately 500-600 trips. If each group utilized half of the potential additional landings, there could be about 300 trips utilizing the additional quota. However, the vessels that might participate (both the larger and smaller) are generally already fishing for other demersal species (primarily squid), and if a vessel switches from squid fishing to butterfish fishing there would be no substantial change in effort and therefore impacts – industry contacts report that transferred directed fishing for butterfish is likely to take place in approximately the same location as squid fishing (vessels make small depth changes to focus on one or the other). Also, industry contacts report that they use the same gear, and fish the gear in approximately the same fashion (some contacts reported that they fish their gear even lighter on the bottom for butterfish than for squid as squid are more likely to slip under a net from their perspective). Contacts from SeaFreeze, Ltd. also reported that they are able to

fill their vessel faster (more fish per haul) with butterfish, and over the course of a standard week's loading/transit/fishing/transit/unloading, would make fewer total hauls with less total bottom contact time if they do switch from squid fishing to butterfish fishing. Only in cases of extremely good butterfish fishing would a net increase in trips be expected, and in that case still only a relatively small number compared to the level of longfin squid trips (there were an average 1,284 longfin squid VTR records over 2,500 pounds per year from 2009-2013).

Also, industry contacts have reported that they have high hopes that markets will be able to be quickly developed, but it is also possible that it may take several years to develop the kinds of markets that would absorb higher landings in the ranges being considered.

Thus the increases in butterfish ABC/landings in 4b/4c should not lead to a more than minimal change in total effort utilizing bottom-tending mobile gear compared to the no action because the vessels that would be likely to fish for butterfish would likely be squid fishing and having the same approximate bottom impact in either case. In fact, if vessels fish lighter on the bottom or make fewer hauls as some fishery participants predict, habitat impacts could actually lessen if effort is shifted toward butterfish. Overall however, since some increased effort might occur, impacts on habitat are likely best described as minimal, but low negative in direction compared to the no action. 4c, with its stepped increase would have less negative impact than 4b, but the difference is likely negligible. Given the lack of a substantial directed fishery in recent years, fleet performance during the 2015-2017 seasons covered by this action should be analyzed in the future to confirm the minimal changes predicted in this document.

Alternative Set 5 –Longfin Squid Specifications

Longfin squid are taken mostly by bottom otter trawls in terms of directed fishing. Due to the year to year variation in catch and effort in the fishery, it is difficult to quantify habitat impacts but since under the no action/status quo/preferred alternative (5a) the effective catch limit would remain the same, habitat impacts would be expected to be low negative (about the same as the previous fishing year and minimized to the extent practicable through previous actions – see Section 6.3). With 5b, since the effective catch limit would be higher than the status-quo, the impact of 5b as an implemented specification should be less protective, i.e. negative, compared to the no action or 5c. However, since catch has recently been below even the no action alternative's specifications, impacts may be similar to the prior fishing year. Given the above, for 5b overall habitat impacts are likely best characterized as "low negative" compared to the no action or 5c. With 5c, since the effective catch limit would be lower than the status-quo or 5b, the impact of 5c as an implemented specification should be more protective, i.e. positive, compared to the no action, as well as 5b. However, since catch has also recently been below 5c's specifications, impacts may be similar to the no action. Given the above, for 5c overall habitat impacts are likely best characterized as "low positive" compared to the no action or 5b.

Habitat Impacts Summary

Status quo MSB fishing does impact habitat, but impacts have been minimized to the extent practicable by other actions. The mackerel and RH/S alternatives considered in this document are likely to have minimal impacts on effort by bottom-tending gear. The squid (*Illex* and longfin) specifications are proposed to remain the same, but alternatives that increased their quotas could increase habitat impacts (3b/5b could have negative impacts) and alternatives that decreased their quotas could decrease impacts (3c/5c could have positive impacts). The increases to the butterfish ABC and landings limits under 4b and 4c could have minimally negative impacts.

7.3 Impacts on Protected Resources

Note: As discussed in Table 55, the availability of the targeted species may drive effort (and impacts on protected resources) as much as quotas and other regulations.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - No Action/status-quo for 2015 mackerel specifications
1b (Preferred) - 2015 mackerel specifications based on long-term median
1c - 2015 mackerel specifications based on 1992-2001 average catch
2a - No Action/status-quo for 2015 RH/S cap (236 mt)
2b (Preferred) - Two-phase 89 mt/155 mt 2015 RH/S cap
2c - 155 MT metric tons (mt) 2015 RH/S cap
3a (Preferred) - New 3-year *Illex* specifications (2015-2017) at same level as current, which also would be no action/status-quo
3b - ABC 25% higher than preferred for 2015-2017 *Illex* specifications
3c - ABC 25% lower than preferred for 2015-2017 *Illex* specifications
4a - No Action/status quo for 2015 butterfish specifications
4b (Preferred) - New 3-year butterfish specifications (2015-2017) based on new assessment
4c - Stepped increases for new 3-year butterfish specifications (2015-2017)
5a (Preferred) - New 3-year longfin squid specifications (2015-2017) at same level as current, which also would be no action/status-quo
5b - ABC 25% higher than preferred for 2015-2017 longfin squid specifications
5c - ABC 25% lower than preferred for 2015-2017 longfin squid specifications

Alternative Set 1 –Mackerel Specifications

Due to the year-to-year variation in catch and effort in the mackerel fishery, it is difficult to quantify protected species impacts. Section 6.4 describes the available information on recent interactions between the mackerel fishery gear types and endangered and other protected species. Since the mackerel fishery overlaps with protected species distributions, some interactions are possible with the species highlighted in Section 6.4 (including turtles, marine mammals, and sturgeon). Because they only differ in degree, 1a (no action), 1b (preferred), and 1c are addressed together. Because some interactions with protected species are possible, impacts on protected resources would likely be low negative, but would remain the same as in previous years, if the status quo specifications are maintained under the no action alternative. Restricting catch could lower effort, so compared to no action (1a - 80,000 mt ABC), both the preferred 1b (40,165 mt ABC) and 1c (33,400 mt ABC) could be more protective of protected resources and have positive impacts. However, since mackerel catches have been below all of these options in recent years, the benefit of 1b or 1c is likely to be low (i.e. the specifications may not be constraining) compared to the no action or each other.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

Note: These impacts are consistent with the findings in Amendment 14, which noted that if the

directed mackerel fishery is closed earlier than would otherwise occur because of a mortality cap, protected species benefit due to the resulting reduction in effort.

Due to the year-to-year variation in catch and effort in the mackerel fishery, it is difficult to quantify protected species impacts. Section 6.4 describes the available information on recent interactions between the mackerel fishery gear types and endangered and other protected species. Since the mackerel fishery overlaps with protected species distributions, some interactions are possible with the species highlighted in Section 6.4 (including turtles, marine mammals, and sturgeon). Because they only differ in degree, 2a (no action), 2b (preferred), and 2c are addressed together. Because the existing cap may limit mackerel catches, impacts on protected resources would likely be low positive if the status quo cap specifications are maintained under the no action alternative. Restricting catch could lower effort if the RH/S cap closes the mackerel fishery, so compared to the no action (2a - 236 mt cap), both the preferred 1b (two-phase 89/155 mt cap) and 1c (155 mt) could be more protective of protected resources and have positive impacts. However, since mackerel catches have been low in recent years, the benefit of 2b or 2c is likely to be low (i.e. the specifications may not be constraining) compared to the no action or each other, especially if the mackerel fishery can avoid RH/S.

Alternative Set 3 –*Illex* Specifications

Section 6.4 describes the available information on recent interactions between the *Illex* fishery gear types (bottom trawl) and endangered and other protected species. Since the *Illex* fishery overlaps with some protected species distributions, some interactions are possible with the species highlighted in Section 6.4 (including turtles, marine mammals, and sturgeon).

Illex are taken almost exclusively by bottom otter trawls. Due to the year to year variation in catch and effort in the *Illex* fishery, it is difficult to quantify protected species impacts but since under the no action/status quo/preferred alternative (3a) the effective catch limit would remain the same, impacts would be expected to be low negative, but similar to the prior fishing year. With 3b, since the effective catch limit would be higher than the status-quo, the impact of 3b as an implemented specification should be less protective (i.e. result in negative impacts) compared to the no action or 3c. However, since catch has recently been below even the no action alternative's specifications, impacts may be similar to the prior fishing year (i.e. the specifications may not be constraining). Given the above, for 3b overall protected species impacts are likely best characterized as "low negative" compared to the no action or 3c. With 3c, since the effective catch limit would be lower than the status-quo or 3b, the impact of 3c as an implemented specification should be more protective, with positive impacts compared to the no action or 3b. However, since catch has also recently been below 3c's specifications, impacts may be similar to the prior fishing year (i.e. the specifications may not be constraining). Given the above, for 3c overall protected species impacts are likely best characterized as "low positive" compared to the no action or 3b.

Alternative Set 4 – Butterfish Specifications

4a – No Action/status quo – ABC of 9,100 mt, landings of 3,200 mt, butterfish cap of 3,884 mt.

Impacts on protected species would likely be low negative, but about the same as the previous fishing year if the status quo is maintained under the no action alternative. There is some directed fishing for butterfish at current levels, and bottom-tending mobile gear is utilized, which has the potential to interact with protected species as described in section 6.4. The butterfish specifications also can limit longfin squid effort due to the butterfish cap. Longfin squid are caught in bottom trawls, which also have the potential to have protected species interactions. No changes to the butterfish cap are considered across the butterfish specifications so indirect butterfish-longfin impacts are not discussed further.

4b – preferred– ABCs over 3 years of about 32,000 mt; landings of about 22,000 mt, and a butterfish cap of 3,884 mt.
4c – stepped increases– ABCs over 3 years of about 16,000 mt, 24,000 mt, and 31,000 mt; landings of about 9,000 mt, 15,000 mt, and 21,000 mt, and a butterfish cap of 3,884 mt.

(Both 4b and 4c are higher than the no action and are treated together.)

The potential landings increases that are part of 4b and 4c could increase butterfish effort compared to the no action. 4b could increase landings by about 19,000 mt and 4c does basically the same thing just over 3 years, so the long term protected species impacts if these specifications were implemented are approximately the same and can be discussed together, focused on an increase of about 19,000 mt of butterfish landings.

In terms of protected species impacts, the key is how the increased quota translates into total additional fishing effort. Given the lack of a directed fishery in recent years, the best source of information on this topic comes from industry contacts. According to industry contacts, there are two kinds of vessels that may increase fishing for butterfish. One kind is the large freezer vessels. In 2001, the last year of substantial directed butterfish fishing, it only took the 10 largest trips by just two vessels to catch 2,214 mt (an average of 221 mt per trip). 19,000 mt could translate into around 80-90 directed trips at an average of around 221 mt. The other kind of vessel (which have not been active participants) would only be landing around 30-40 mt per trip, which could theoretically translate into approximately 500-600 trips. If each group utilized half of the potential additional landings, there could be about 300 trips utilizing the additional quota. However, the vessels that might participate (both the larger and smaller) are generally already fishing for other demersal species (primarily squid), and if a vessel switches from squid fishing to butterfish fishing there would be no substantial change in effort and therefore impacts – industry contacts report that transferred directed fishing for butterfish is likely to take place in approximately the same location as squid fishing (vessels make small depth changes to focus on one or the other). Also, industry contacts report that they use the same gear, and fish the gear in approximately the same fashion. Contacts from SeaFreeze, Ltd. also reported that they are able to fill their vessel faster (more fish per haul) with butterfish, and over the course of a standard week's loading/transit/fishing/transit/unloading, would make fewer total hauls if they do switch from squid fishing to butterfish fishing. Only in cases of extremely good butterfish fishing would a net increase in trips be expected, and in that case still only a relatively small number compared to the level of longfin squid trips (there were an average 1,284 longfin squid VTR records over 2,500 pounds per year from

2009-2013).

Also, industry contacts have reported that they have high hopes that markets will be able to be quickly developed, but it is also possible that it may take several years to develop the kinds of markets that would absorb higher landings in the ranges being considered.

Thus the increases in butterfish ABC/landings in 4b/4c should not lead to a more than minimal change in total effort compared to the no action because the vessels that would be likely to fish for butterfish would likely be squid fishing and having the same approximate bottom trawling effort in either case. Overall however, since some increased effort might occur, impacts on protected resources are likely best described as minimal, but low negative in direction compared to the no action. 4c, with its stepped increase would have less negative impact than 4b, but the difference is likely negligible. Given the lack of a substantial directed fishery in recent years, fleet performance during the 2015-2017 seasons covered by this action should be analyzed in the future to confirm the minimal changes predicted in this document.

Alternative Set 5 –Longfin Squid Specifications

Section 6.4 describes the available information on recent interactions between the longfin squid fishery gear types (bottom trawl) and endangered and other protected species. Since the longfin squid fishery overlaps with some protected species distributions, some interactions are possible with the species highlighted in Section 6.4 (including turtles, marine mammals, and sturgeon).

Longfin squid are taken mostly by bottom otter trawls in terms of directed fishing. Due to the year to year variation in catch and effort in the fishery, it is difficult to quantify protected species impacts. However, since under the no action/status quo/preferred alternative (5a) the effective catch limit would remain the same, and because there is the potential for protected species interactions with the gear used to target longfin squid, impacts would be expected to be low negative, but similar to the prior fishing year. With 5b, since the effective catch limit would be higher than the status-quo, the impact of 5b as an implemented specification should be less protective (i.e. negative impacts) than the no action or 5c. However, since catch has recently been below even the no action alternative's specifications, impacts may be similar to the prior fishing year. Given the above, for 5b overall protected species impacts are likely best characterized as "low negative" compared to the no action or 5c. With 5c, since the effective catch limit would be lower than the status-quo or 5b, the impact of 5c as an implemented specification should be more protective (i.e. positive impacts) than the no action or 5b. However, since catch has also recently been below 5c's specifications, impacts may be similar to the no action. Given the above, for 5c overall protected species impacts are likely best characterized as "low positive" compared to the no action or 5b.

Protected Resources Impacts Summary

No action/status quo impacts are described in section 6.4. Most of the action alternatives considered in this document should have similar impacts relative to the no action. The reductions considered for the mackerel fishery and/or the RH/S cap on the mackerel fishery (1b-1c and/or 2b-2c) could decrease mackerel effort and therefore have positive impacts for protected species that interact with the mackerel fishery but the benefits are likely to be low because the reductions may still not constrain the

fishery. The squid (*Illex* and longfin) specifications are proposed to remain the same, but alternatives that increased their quotas could increase protected resource interactions (3b/5b could have negative impacts) and alternatives that decreased their quotas could decrease interactions (3c/5c could have positive impacts). The increases proposed for butterfish (4b, 4c) could have negative impacts in terms of direction, but are likely low in terms of their intensity.

7.4 Socioeconomic Impacts

Note: As discussed in Table 55 and accompanying text, the availability of the targeted species may drive effort (and catch and revenues) as much as quotas and other regulations.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - No Action/status-quo for 2015 mackerel specifications
1b (Preferred) - 2015 mackerel specifications based on long-term median
1c - 2015 mackerel specifications based on 1992-2001 average catch
2a - No Action/status-quo for 2015 RH/S cap (236 mt)
2b (Preferred) - Two-phase 89 mt/155 mt 2015 RH/S cap
2c - 155 MT metric tons (mt) 2015 RH/S cap
3a (Preferred) - New 3-year *Illex* specifications (2015-2017) at same level as current, which also would be no action/status-quo
3b - ABC 25% higher than preferred for 2015-2017 *Illex* specifications
3c - ABC 25% lower than preferred for 2015-2017 *Illex* specifications
4a - No Action/status quo for 2015 butterfish specifications
4b (Preferred) - New 3-year butterfish specifications (2015-2017) based on new assessment
4c - Stepped increases for new 3-year butterfish specifications (2015-2017)
5a (Preferred) - New 3-year longfin squid specifications (2015-2017) at same level as current, which also would be no action/status-quo
5b - ABC 25% higher than preferred for 2015-2017 longfin squid specifications
5c - ABC 25% lower than preferred for 2015-2017 longfin squid specifications

Note on RSA: While the specifications allow for research set-asides (RSA), the Council has suspended the RSA program pending further review of its overall utility, so it is very unlikely that any RSA will be used.

Alternative Set 1 –Mackerel Specifications

Due to the year to year variation in catch and effort in the mackerel fishery, it is difficult to quantify human community impacts. The current fishery supports a number of vessels, as described in Section 6.6. Mackerel catches, and therefore revenues, have been very low in recent years. All landings since 2010 have been lower than even the lowest mackerel specification alternative so it appears likely that none of the mackerel specifications will be constraining so none would lead to revenue losses compared to recent years. Since under the no action/status quo (1a) the effective catch limit would remain the same, impacts would be expected to be low positive, i.e. produce revenues similar to the

prior fishing year. However, compared to the no action (1a), 1b's specifications result in a landings quota that is 12,949 mt less and 1c's specifications result in a landings quota that is 18,588 mt less. Thus while none of the lower action alternatives would reduce revenues from recent years, at 2013 prices ($436/mt) compared to the no action/status quo there would be the potential for $5.6 million in foregone revenues from alternative 1b and $8.1 million in foregone revenues from alternative 1c. Thus human community impacts (short term) are low negative for 1b and 1c compared to the no action. However, if 1b or 1c led to stock improvements there could be positive long term impacts.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

Consistent with the findings in Amendment 14, lower RH/S caps may lead to potentially reduced revenues for fishery participants if the mackerel fishery is closed, but if the caps assist recovery of RH/S, then lower caps might result in additional long term benefits related to commercial revenues, recreational opportunities, ecosystem services, cultural values for RH/S, and/or other non-market existence values (i.e. value gained by the public related to the knowledge that these species are being conserved successfully). Based on the operation of the cap in 2014 (the first year of the cap), as long as the fishery can maintain relatively low RH/S catch rates, none of the options considered should constrain the fishery so none should negatively impact fishery participants – in other words all could have neutral impacts. However, a few large RH/S bycatch events could potentially shut down the fishery early. At 2013 prices ($436/mt), the proposed mackerel quota (20,872 mt – 1b) could potentially generate about $9.1 million. While the performance of the cap in 2014 suggests the fishery can operate with very low RH/S catch rates, consistent with Amendment 14's analysis, if RH/S catch rates happen to be relatively high then most of the mackerel catch, and associated revenues could be forgone. From 2005-2014 this happened one year, in 2007. Also, in 2012 RH/S catch rates were high enough that the fishery would have closed at around 4,400 mt of mackerel had alternative 2b been in effect (5,047 mt were landed on applicable trips landing over 20,000 pounds resulting in 96 mt of estimated RH/S catch).

Given the above, the no action/status quo (1a – 236 mt) would be expected to have low negative impacts (the fishery might be closed but wouldn't be likely to do so given recent performance). Compared to no action, the preferred two-phase 89mt/155mt cap (1b) could result in the most forgone revenue, with the simple 155mt cap (1c) being in between the no action/status quo and 1b. Given the recent operation of the fishery it appears possible that none of the alternatives will be constraining, but the results strongly depend on the performance of the fishery in terms of RH/S catch rates and general landings on mackerel trips in any given year. The industry has also been actively participating in a voluntary avoidance program that should help to keep RH/S catches low. Thus human community impacts (short term) are low negative for 2b and 2c compared to the no action. However, if 2b or 2c led to RH/S stock improvement there could be associated positive long term impacts.

Alternative Set 3 –*Illex* Specifications

Due to the year to year variation in catch and effort in the *Illex* fishery, it is difficult to quantify human community impacts. The current fishery supports a number of vessels, as described in Section 6.6. Given the effective catch limit would remain the same with the no action, impacts would be expected to be positive, i.e. similar to the prior fishing year (landings limit = 22,915 mt). This alternative would however allow increased catch and revenues compared to how the fishery actually operated in recent years – the current quota has not been limiting since 2005. 3b would increase the landings limit to

28,644 mt, but since recent years catches have not reached the no action/status quo quota, no impacts would be expected. However, the extra 5,729 mt quota would have an ex-vessel value of about $3.5 million at 2013 prices ($610/mt). 3c would decrease the landings limit to 17,186 mt. Recent catches since 2005 have only surpassed 17,186 mt twice (2009 and 2011) with 2011 the highest at 18,797 mt. However, compared to the no action/status quo quota, the difference in potential landings (5,729 mt) could translate into about $3.7 million in potentially forgone revenues compared to the no action, and about $7 million in potentially forgone revenues compared to 3b. Thus human community impacts (short term) are positive for no action (3a), positive for 3b, and low negative for 3c compared to the no action. However, if 3b led to stock decline there could be negative long term impacts.

Alternative Set 4 – Butterfish Specifications

The butterfish fishery has mostly been an incidental fishery since 2002. 2014 is the first year of a small directed fishery, with a landings limit of 3,200 mt. If that limit is caught at 2013 prices ($1,481 mt), the resulting revenues would be about $4.7 million. Under 4b, the landings limits (DAH) are similar each year and the average landings limit for 2015-2017 would be 21,408 mt. This would be 18,208 mt larger than the 2014 limit, which could potentially translate into $31.7 million additional ex-vessel revenues at 2013 prices. Under 4c, a stepped increase is used such that the landings limits 2015-2017 would be 9,017 mt, 14,835 mt, and 20,652 mt, or increases of 5,817 mt, 11,635 mt, and 17,452 mt from the no action. If caught, these increases could potentially translate into additional ex-vessel revenues of $8.6 million, $17.2 million, and $25.8 million, making it a middle ground between 4a and 4b. It is not clear that the fishery will actually land such higher amounts or if the price would remain near $1,481/mt at higher catch levels, so these values are likely "upper end" possibilities. Industry contacts have reported that they have high hopes that markets will be able to be quickly developed, but it is also possible that it may take several years to develop the kinds of markets that would absorb higher landings in the ranges being considered.

Thus human community impacts are continuing low positive for no action/status quo (4a), and positive for 4b and 4c compared to the no action, but highest for 4b.

Alternative Set 5 – Longfin Squid Specifications

Due to the year to year variation in catch and effort in the longfin squid fishery, it is difficult to quantify human community impacts. The current fishery supports a number of vessels, as described in Section 6.6. Given the effective catch limit would remain the same with the no action/status quo, impacts would be expected to be positive, i.e. similar to the prior fishing year (landings limit = 22,445 mt). This alternative would however allow increased catch and revenues compared to how the fishery actually operated in recent years – the current quota has not been limiting since 1994. 5b would increase the landings limit to 28,057 mt, but since recent years catches have not reached the no action/status quo quota, no impacts would be expected. However, the extra 5,612 mt quota would have an ex-vessel value of about $13.3 million at 2013 prices ($2,365/mt). 5c would decrease the landings limit to 16,834 mt. Recent catches have been below this since 2002 so there might be no effect. However, compared to the no action/status quo quota, the difference in potential landings (5,612 mt) could translate into about $13.3 million in potentially forgone revenues compared to the no action, and about $26.6 million in potentially forgone revenues compared to 5b. Thus human community impacts (short term) are positive for no action (5a), positive for 5b, and low negative for 5c compared to the no action. However, if 5b led to stock decline there could be negative long term impacts.

Socioeconomic Impacts Summary

The lower mackerel specifications and lower river herring/shad caps have the potential to cause reductions in mackerel revenues compared to the no action/status quo specifications if mackerel become available to the fishery. Gains made from improved stock abundances may theoretically offset these reductions to some degree. Changing the squid specifications from the no action/status quo would not appear to be beneficial, especially if long term impacts are considered. Increasing the butterfish specifications from the no action/status quo should lead to positive impacts.

7.5 Impacts on non-Target Fish Species

Various species are caught incidentally by the MSB fisheries and will be impacted to some degree by the ongoing prosecution of the MSB fisheries even under the no action alternative. Recent non-target species interactions in the MSB fisheries are summarized in Section 6.5 and represent the no action/status quo impacts. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. Also, as discussed in Table 55, the availability of the targeted species may drive effort (and non-target fish species impacts) as much as quotas and other regulations.

To facilitate tracking of alternatives in this impact section, a list of alternatives is provided first (all alternatives are detailed in Section 5):

1a - No Action/status-quo for 2015 mackerel specifications
1b (Preferred) - 2015 mackerel specifications based on long-term median
1c - 2015 mackerel specifications based on 1992-2001 average catch
2a - No Action/status-quo for 2015 RH/S cap (236 mt)
2b (Preferred) - Two-phase 89 mt/155 mt 2015 RH/S cap
2c - 155 MT metric tons (mt) 2015 RH/S cap
3a (Preferred) - New 3-year *Illex* specifications (2015-2017) at same level as current, which also would be no action/status-quo
3b - ABC 25% higher than preferred for 2015-2017 *Illex* specifications
3c - ABC 25% lower than preferred for 2015-2017 *Illex* specifications
4a - No Action/status quo for 2015 butterfish specifications
4b (Preferred) - New 3-year butterfish specifications (2015-2017) based on new assessment
4c - Stepped increases for new 3-year butterfish specifications (2015-2017)
5a (Preferred) - New 3-year longfin squid specifications (2015-2017) at same level as current, which also would be no action/status-quo
5b - ABC 25% higher than preferred for 2015-2017 longfin squid specifications
5c - ABC 25% lower than preferred for 2015-2017 longfin squid specifications

Alternative Set 1 –Mackerel Specifications

The no action/status quo (1a) should have impacts that are low negative, i.e. similar to the previous year (the mackerel fishery has relatively low non-target interaction rates and the RH/S cap controls catch of RH/S species). Restricting catch could lower effort, so compared to the no action (1a - 80,000 mt ABC), both the preferred 1b (40,165 mt ABC) and 1c (33,400 mt ABC) could be more protective of

non-target species and have positive impacts. However, since mackerel catches have been below all of these options in recent years, the benefit of 1b or 1c is likely to be low (i.e. the specifications may not be constraining) compared to the no action or each other.

Alternative Set 2 – River Herring/Shad (RH/S) Cap for the Mackerel Fishery

The no action/status quo (2a) should have impacts that are low positive and similar to the previous year. The no action maintains incentive to avoid RH/S and could close the mackerel fishery early, but the mackerel fishery appears able to operate within the cap. Restricting catch could lower effort if the RH/S cap closes the mackerel fishery, so compared to the no action (2a - 236 mt cap), both the preferred 1b (two-phase 89/155 mt cap) and 1c (155 mt) could be more protective of non-target species (especially RH/S) and have positive impacts. However, since mackerel catches have been low in recent years, the benefit of 2b or 2c is likely to be low (i.e. the specifications may not be constraining) compared to the no action or each other.

Alternative Set 3 –*Illex* Specifications

Since under the no action/status quo/preferred alternative (3a) the effective catch limit would remain the same, non-target species impacts would be expected to be low negative and similar to the prior fishing year (the *Illex* fishery has relatively low non-target interaction rates). With 3b, since the effective catch limit would be higher than the status-quo, the impact of 3b as an implemented specification should be less protective (negative impacts) compared to the no action or 3c. However, since catch has recently been below even the no action alternative's specifications, impacts may be similar to the prior fishing year. Given the above, for 3b overall non-target species impacts are likely best characterized as "low negative" compared to the no action or 3c (especially since the *Illex* fishery has low discards in general). With 3c, since the effective catch limit would be lower than the status-quo or 3b, the impact of 3c as an implemented specification should be more protective (positive impacts) than the no action or 3b. However, since catch has also recently been below 3c's specifications, impacts may be similar to the prior fishing year. Given the above, for 3c overall non-target species impacts are likely best characterized as "low positive" compared to the no action or 3b (especially since the *Illex* fishery has low discards in general).

Alternative Set 4 – Butterfish Specifications

Note: The butterfish specifications also can indirectly limit longfin squid effort due to the butterfish cap. Longfin squid are mostly caught in bottom trawls, and the longfin squid fishery has relatively high bycatch rates. No changes to the butterfish cap are considered across the butterfish specifications however so indirect butterfish-longfin impacts related to the cap are not discussed further.

4a – No Action/status quo – ABC of 9,100 mt, landings of 3,200 mt, butterfish cap of 3,884 mt.

Since under the no action/status quo/preferred alternative (4a) the effective catch limit would remain the same, non-target species impacts would be expected to be low negative and similar to the prior fishing year. Given the limited fishery for butterfish in recent years, minimal data is available on non-target interactions. Prior specifications identified red hake, silver hake, spiny dogfish, scup, unclassified skates, fourspot flounder, longfin squid, mackerel, and little skate as primary

bycatch/discard species in the butterfish fishery. Beginning in 2013-2014 a limited directed fishery for butterfish was re-established and these species could be impacted. However, in previous years when the butterfish fishery operated there was no minimum mesh and attitudes about discarding were different. It is expected that the 3" minimum mesh incorporated as part of the reestablishment of the butterfish fishery will minimize bycatch (further reducing the applicability of previous analyses), and any observer data from trips targeting butterfish will be examined in the future to describe non-target interactions and to determine if additional bycatch minimization measures are needed. There are also ongoing discussions for some of the major butterfish participants to voluntarily notify observer providers so that new discard information can be collected.

4b – preferred– ABCs over 3 years of about 32,000 mt; landings of about 22,000 mt, and a butterfish cap of 3,884 mt; AND
4c – stepped increases– ABCs over 3 years of about 16,000 mt, 24,000 mt, and 31,000 mt; landings of about 9,000 mt, 15,000 mt, and 21,000 mt, and a butterfish cap of 3,884 mt.

(Both 4b and 4c are higher than the no action and are treated together.)

The potential landings increases that are part of 4b and 4c could increase butterfish effort compared to the no action. 4b could increase landings by about 19,000 mt and 4c does basically the same thing just over 3 years, so the long term non-target species impacts if these specifications were implemented are approximately the same and can be discussed together focused on an increase of about 19,000 mt of butterfish landings and concordant effort.

For non-target species impacts, the key is how changes impact total fishing effort. Given the lack of a directed fishery in recent years, the best source of information on this topic comes from industry contacts. According to industry contacts, there are two kinds of vessels that may increase fishing for butterfish. One kind is the large freezer vessels. In 2001, the last year of substantial directed butterfish fishing, it only took the 10 largest trips by just two vessels to catch 2,214 mt (an average of 221 mt per trip). 19,000 mt could translate into around 80-90 directed trips at an average of around 221 mt. The other kind of vessel (which have not been active participants) would only be landing around 30-40 mt per trip, which could theoretically translate into approximately 500-600 trips. If each group utilized half of the potential additional landings, there could be about 300 trips utilizing the additional quota. However, the vessels that might participate (both the larger and smaller) are generally already fishing for other demersal species (primarily squid), and if a vessel switches from squid fishing to butterfish fishing there would be no substantial change in effort and therefore impacts – industry contacts report that transferred directed fishing for butterfish is likely to take place in approximately the same location as squid fishing (vessels make small depth changes to focus on one or the other). Also, industry contacts report that they use the same gear, and fish the gear in approximately the same fashion. Contacts from SeaFreeze, Ltd. also reported that they are able to fill their vessel faster (more fish per haul) with butterfish, and over the course of a standard week's loading/transit/fishing/transit/unloading, would make fewer total hauls if they do switch from squid fishing to butterfish fishing. Only in cases of extremely good butterfish fishing would a net increase in trips be expected, and in that case still only a relatively small number compared to the level of longfin squid trips (there were an average 1,284 longfin squid VTR records over 2,500 pounds per year from 2009-2013).

Also, industry contacts have reported that they have high hopes that markets will be able to be quickly developed, but it is also possible that it may take several years to develop the kinds of markets that would absorb higher landings in the ranges being considered.

Thus the increases in butterfish ABC/landings in 4b/4c should not lead to a more than minimal change in total effort compared to the no action - the vessels that would be likely to fish for butterfish would likely be squid fishing and have the same approximate bottom trawling effort in either case. Overall however, since some increased effort might occur, impacts on non-target species are likely best described as minimal, but low negative in direction compared to the no action. 4c, with its stepped increase would have less negative impact than 4b, but the difference is likely negligible. Given the lack of a substantial directed fishery in recent years, fleet performance during the 2015-2017 seasons covered by this action should be analyzed in the future to confirm the minimal changes predicted in this document.

Alternative Set 5 – Longfin Squid Specifications

Since under the no action/status quo/preferred alternative (5a) the effective catch limit would remain the same, non-target species impacts would be expected to be low negative and similar to the prior fishing year. While the longfin squid fishery has relatively high non-target interaction rates, previous actions (e.g. MSB Amendment 10 and gear restricted areas for scup) have reduced impacts to the extent practicable. With 5b, since the effective catch limit would be higher than the status-quo, the impact of 5b as an implemented specification should be less protective (negative impacts) compared to the no action or 5c. However, since catch has recently been below even the no action alternative's specifications, impacts may be similar to the prior fishing year. Given the above, for 5b overall non-target species impacts are likely best characterized as "low negative" compared to the no action or 5c. With 5c, since the effective catch limit would be lower than the status-quo or 5b, the impact of 5c as an implemented specification should be more protective (positive impacts) compared to the no action or 5b. However, since catch has also recently been below 5c's specifications, impacts may be similar to the prior fishing year. Given the above, for 5c overall non-target species impacts are likely best characterized as "low positive" compared to the no action or 5b.

Non-Target Species Impacts Summary

Most of the action alternatives considered in this document should have approximately similar impacts relative to the no action (detailed in Section 6.5). Reductions in the mackerel and/or the RH/S cap may result in less mackerel effort but there hasn't been much mackerel effort in general in recent years so impacts should be low. The squid (*Illex*/longfin) specifications are proposed to remain the same, but alternatives that increased their quotas could increase non-target species interactions (3b/5b could have negative impacts) and alternatives that decreased their quotas could decrease interactions (3c/5c could have positive impacts). Increases proposed for butterfish (4b, 4c) could have negative impacts in terms of direction, but are likely low in terms of their intensity.

7.6 Cumulative Impacts of Preferred Alternatives on Identified Valued Ecosystem Components

The impacts of the proposed specifications (preferred alternatives) considered herein are expected to be positive since they are likely to provide positive socioeconomic benefits without inducing substantial negative impacts to the managed species, habitat, protected resources, or other non-target species. The proposed specifications are considered the most reasonable actions to achieve the FMP's conservation objectives while optimizing the outcomes for fishing communities given the conservation objectives, as per the objectives of the FMP, which are summarized in Section 4. The expected impacts of each alternative have been analyzed earlier in this section and are summarized in Table 1 in the Executive Summary for the no action/status quo and preferred alternatives.

Definition of Cumulative Effects

A cumulative impact analysis is required by the Council on Environmental Quality's regulation for implementation of NEPA. Cumulative effects are defined under NEPA as "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action (40 CFR section 1508.7)."

The cumulative impacts of past, present, and future Federal fishery management actions (including the specification recommendations in this document) should generally be positive. The mandates of the MSA as currently amended and of the NEPA require that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Therefore, it is expected that under the current and proposed management regime, the long term cumulative impacts will contribute toward improving the human environment.

Temporal Scope

The temporal scope of this analysis is primarily focused on actions that have taken place since 1976, when these fisheries began to be managed under the MSA. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, the analysis considers the period between the expected effective date of these specifications (January 1, 2015) and Dec 31, 2019, a period of five years. The temporal scope of this analysis does not extend beyond 2019 because the FMP and the issues facing these fisheries may change in ways that can't be effectively predicted.

Geographic Scope

The geographic scope of the analysis of impacts to fish species and habitat for this action is the range of the fisheries in the Western Atlantic Ocean, as described in the Affected Environment and Environmental Consequences sections of the document. For endangered and protected species the geographic range is the total range of each species. The geographic range for socioeconomic impacts is defined as those fishing communities bordering the range of the fisheries for mackerel, longfin squid

and *Illex* squid and butterfish which occur primarily from the U.S.- Canada border to Cape Hatteras, although the management unit includes all the coastal states from Maine to Florida.

Summary of the Past, Present and Reasonably Foreseeable Future Actions

The earliest management actions implemented under this FMP involved the sequential phasing out of foreign fishing for these species in US waters and the development of a domestic fishing fleet. All MSB species are considered to be fully utilized by the US domestic fishery to the extent that sufficient availability would allow full harvest of the DAH/landings quota. More recent actions have focused on reducing bycatch and habitat impacts.

Past actions which had a major impact on the fishery included: the implementation of a limited access program in Amendment 5 to control capacity in the squid and butterfish fisheries; revision of overfishing definitions in Amendment 6; modification of vessel upgrade rules in Amendment 7; and implementation of overfishing and rebuilding control rules and other measures in Amendment 8. Amendment 9 allowed multi-year specifications, extended the moratorium on entry into the *Illex* fishery without a sunset provision; adopted biological reference points recommended by the SARC 34 (2002) for longfin squid; designated EFH for longfin squid eggs, and prohibited bottom trawling by MSB-permitted vessels in Lydonia and Oceanographer Canyons. Amendment 10's measures included increasing the longfin squid minimum mesh to 2 1/8 inches in Trimesters 1 and 3 and implementing a butterfish mortality cap in the longfin squid fishery. Amendment 11 implemented mackerel limited access, a recreational-commercial mackerel allocation, and EFH updates. Amendment 12 implemented a Standardized Bycatch Reporting Methodology that has since been vacated by court order and is being revisited in a new upcoming amendment. Amendment 13 to the MSB FMP implemented Annual Catch Limit and Accountability Measures.

Amendment 14 is likely to result in ongoing mitigation of non-target catch of river herring and shads. Amendment 14 increased and improved reporting and monitoring (vessel, dealer, and observer) of the mackerel and longfin squid fisheries and implemented a cap catch of river herrings and shads in the mackerel fishery in 2014. Monitoring improvements include minimization of unobserved catch, observer facilitation and assistance, weekly vessel trip reporting, additional trip notification, and electronic vessel monitoring systems and reporting.

Past annual specifications have limited catches to avoid overfishing. Annual specifications actions in future years should maintain the benefits as described above. Other actions expected to be implemented before 2019 include Amendment 16, which will protect deep water corals, a new Standardized Bycatch Reporting Methodology, Framework 9, which will improve observer operations by minimizing slippage (unobserved discards), and an omnibus Amendment to increase observer coverage through industry funding.

Amendment 5 and Framework 3 to the Atlantic Herring FMP will institute similar river herring/shad measures for the Atlantic Herring fishery (many MSB-permitted vessels have Atlantic herring permits as well) and implementation should be in parallel to Amendment 14.

Regarding protected resources, a take reduction strategy for long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), white-sided dolphins (*Lagenorhynchus acutus*), and common dolphins (*Delphinus delphis*) has been developed and is described in Section 6.

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

In addition to the direct effects on the environment from fishing, the cumulative effects to the physical and biological dimensions of the environment may also come from non-fishing activities (e.g. climate change, point source and non-point source pollution, shipping, dredging, storm events, etc.). Non-fishing activities, in this sense, relate to habitat loss from human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts to habitat such as accretion of sediments from at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of at-sea wind farms, bulk transportation of petrochemicals and significant storm events. In addition to guidelines mandated by the MSA, NMFS reviews some of these types of effects during the review process 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 authority. The jurisdiction of these activities is in "waters of the United States" and includes both riverine and marine habitats.

Cumulative Effects Analysis

The cumulative impacts of this FMP were last fully addressed in final form by the EIS for Amendment 14 (http://www.nero.noaa.gov/regs/2013/August/12smba14pr.html). All four species in the management unit are managed primarily via annual specifications to control fishing mortality so the operation of the fishery is generally reviewed annually. As noted above, the cumulative impact of this FMP and annual specification process has been positive since its implementation after passage of the Magnuson Act for both the resources and communities that depend on them. The elimination of foreign fishing, implementation of limited access, and control of fishing effort through implementation of the annual specifications have had a positive impact on target and non-target species since the current domestic fishery is being prosecuted at lower levels of fishing effort compared to the historical foreign fishery. The foreign fishery was also known to take substantial numbers of marine mammals including common dolphin, white sided dolphin, and pilot whales.

The Council continues to manage these resources in accordance with the National Standards required under the Magnuson-Stevens Act. First and foremost the Council has strived to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that prevent overfishing, while achieving, on a continuing basis, the optimum yield for the four species and the United States fishing industry. The Council uses the best scientific information available (National Standard 2) and manages these resources throughout their range (National Standard 3). The management measures do not discriminate between residents of different states (National Standard 4), and they do not have economic allocation as its sole purpose (National Standard 5). The measures account for variations in fisheries (National Standard 6), avoid unnecessary duplication (National Standard 7), they take into account fishing communities (National Standard 8), address bycatch in these fisheries (National Standard 9) and promote safety at sea (National Standard 10). By continuing to meet the National Standards requirements of the Magnuson-Stevens Act through future FMP

amendments and actions, the Council should insure that cumulative impacts of these actions will remain positive. The cumulative effects of the proposed specifications will be examined for the following five valued economic components: target/managed species, habitat, protected species, communities, and non-target species.

7.6.1. Target Fisheries and Managed Resources

First and foremost, the Council has met the obligations of National Standard 1 by adopting and implementing conservation and management measures that have prevented overfishing, while achieving, on a continuing basis, the optimum yield for the four species. Mackerel were overfished prior to US management under the Magnuson Act and then were subsequently rebuilt under the FMP and subsequent Amendments. While the current status based on a 2010 TRAC assessment is unknown, the stock is likely in better shape compared to if no management had taken place. Longfin squid were considered overfished in 2000 but remedial action by the Council in subsequent years (i.e., reduced specifications) resulted in stock rebuilding to the point that the species in no longer considered overfished. *Illex* has never been designated as overfished since passage of the Sustainable Fisheries Act. In the case of butterfish, the fishery has been designated as fully rebuilt with a stock status above its target.

The most obvious and immediate impact on the stocks managed under this FMP occurs as a result of fishing mortality. The Council manages federally permitted vessels which fish for these four species throughout their range in both Federal and state waters. Fishing mortality from all fishing activities that catch these species is controlled and accounted for by the specifications and incorporated into stock assessments.

In addition to mortality on these stocks due to fishing, there are other indirect effects from non-fishing anthropogenic activities in the Atlantic Ocean (e.g. climate change, point source and non-point source pollution, shipping, dredging, etc.), but these are generally not quantifiable at present for pelagic and semi-pelagic species like MSB other than noting that climate change is likely to affect at least the distribution of these species (e.g. Overholtz et al 2011). Nonetheless, since these species occur over wide areas of the mid and north Atlantic Ocean and inhabit both inshore and offshore pelagic waters, it is unlikely that any indirect anthropogenic activity currently substantially impacts these populations, especially in comparison to the direct effects on these populations as a result of fishing.

The specifications proposed under the preferred alternative for each species were developed to achieve the primary goal of the FMP and Sustainable Fisheries Act which is to prevent overfishing. They are also intended to provide for the greatest overall benefit to the nation (i.e., achieve optimum yield). These measures in conjunction with previous actions and any future actions should continue to allow the Council to continue to manage these resources such that the objectives of the MSA continue to be met and therefore no significant cumulative effects to the target fisheries are expected.

7.6.2 Essential Fish Habitat (EFH)

The 2002 final rule for EFH requires that FMPs minimize to the extent practicable adverse effects on EFH caused by fishing (section 600.815 (a) (2)). Pursuant to the final EFH regulations (50 CFR 600.815(a)(2)), FMPs must contain an evaluation of the potential adverse effects of fishing on EFH designated under the FMP, including effects of each fishing activity regulated under the FMP or other Federal FMPs. The evaluation should consider the effects of each fishing activity on each type of habitat found within EFH. FMPs must describe each fishing activity, review and discuss all available relevant information (such as information regarding the intensity, extent, and frequency of any adverse effect on EFH: the type of habitat within EFH that may be affected adversely; and the habitat functions that may be disturbed), and provide conclusions regarding whether and how each fishing activity adversely affects EFH. The evaluation should also consider the cumulative effects of multiple fishing activities on EFH.

The mackerel fishery primarily uses mid-water trawls. Bottom otter trawls are the principal gear used in the squid and butterfish fisheries. In general, bottom tending mobile gears have the potential to reduce habitat complexity and change benthic communities. Available research indicates that the effects of mobile gear are cumulative and are a function of the frequency and intensity with which an area is fished, the complexity of the benthic habitat (structure), energy of the environment (high energy and variable or low energy and stable), and ecology of the community (long-lived versus short lived). The extent of an adverse impact on habitat requires high resolution data on the location of fishing effort by gear and the location of specific seafloor habitats.

Stevenson *et al.* (2004) performed an evaluation of the potential impacts of otter trawls, and susceptible species and life stages are described in Section 6.3. The Council analyzed MSB gear impacts on EFH in Amendment 9, which also included measures which address gear impacts on EFH. To reduce MSB gear impacts on EFH, Amendment 9 prohibited bottom trawling by MSB-permitted vessels in Lydonia and Oceanographer Canyons. Amendment 1 to the Tilefish FMP created closures in these canyons as well as Veatches and Norfolk canyons for bottom trawling. All EFH designations were updated in Amendment 11 and the new designations will be used in future evaluations. Since the EFH for most MSB species is the water column, MSB species are generally not susceptible to habitat impacts from the MSB fisheries but other fisheries may be. Overall, impacts on EFH have been reduced and will continue to be analyzed to see if additional minimization is practicable in the future. As noted above, none of the management measures under the preferred alternatives are expected to result in substantial changes to levels of overall effort relative to the no action and when combined with past, present and reasonable foreseeable future actions, are not expect to result in significant cumulative impacts to habitat or EFH.

7.6.3 Protected Species

As described in Section 6.4, there are numerous species which inhabit the environment within the management unit of this FMP that are afforded protection under the ESA of 1973 and/or the Marine Mammal Protection MMPA. As noted above, none of the management measures under the preferred alternatives are expected to result in substantial changes to levels of effort relative to the status quo. Prior to the passage of the Magnuson Act and development of this FMP, the foreign prosecution of these fisheries occurred at much higher levels of fishing effort and were likely a major source of mortality for a number of marine mammal stocks, turtles, and sturgeon. The elimination of these fisheries and subsequent controlled development of the domestic fisheries have resulted in lower fishing effort levels. The cumulative effect of the proposed measures in conjunction with past and future management actions under the FMP and take reduction measures developed under the MMPA should continue to reduce the impact of these fisheries on the protected species listed in section 6.4. Therefore, no significant cumulative impacts to protected species are expected.

7.6.4 Human Communities

National Standard 8 requires that management measures take into account fishing communities. Communities from Maine to North Carolina are involved in the harvesting of mackerel, squid and butterfish. Through implementation of the FMP for these species the Council seeks to achieve the primary objective of the Magnuson-Stevens Act which is to achieve optimum yield from these fisheries.

The first cumulative human community effect of the FMP has been to guide the development of the domestic harvest and processing fishery infrastructure. Part of this fishery rationalization process included the development of limited access programs to control capitalization while maintaining harvests at levels that are sustainable. In addition, by meeting the National Standards prescribed in the MSA, the Council has strived to meet one of the primary objectives of the act - to achieve optimum yield in each fishery. The proposed specifications, in conjunction with the past and future actions described above, should have positive, non-significant cumulative impacts for the communities which depend on these resources by maintaining stock sizes that provide for optimal sustainable harvests.

7.6.5 Non-target Species

National Standard 9 requires Councils to consider the bycatch effects of existing and planned conservation and management measures. The term "bycatch" 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 discards and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade.

None of the management measures recommended by the Council under the preferred alternatives are expected to substantially promote or result in increased overall levels of bycatch relative to the status quo because none are expected to substantially increase overall effort. Past measures implemented under this FMP which help to control or reduce discards of non-target species in these fisheries include 1) limited entry and specifications which are intended to control or reduce fishing effort, 2) incidental

and bycatch caps or allowances, and 3) minimum mesh requirements. Other FMPs have also regulated MSB fishing to minimize bycatch as well, such as the Scup Gear Restricted Areas implemented through its FMP. The measures proposed under the preferred alternative for each species, in conjunction with these past actions, should maintain reductions or further reduce historical levels of bycatch and discards in these fisheries. Related to the increase in the butterfish quota for 2015, maintenance of a 3" mesh for directed butterfish fishing, coupled with the fact that increased fishing for butterfish may mean less fishing for longfin squid, means that overall bycatch should continue to be minimized bycatch to the extent practicable (bycatch is relatively high in the longfin squid fishery).

In addition to mortality on these stocks due to fishing, there are other indirect effects from non-fishing anthropogenic activities in the Atlantic Ocean (e.g. climate change, point source and non-point source pollution, shipping, dredging, etc.), but these are generally not quantifiable at present for pelagic and semi-pelagic species like those most likely to be encountered during MSB-fishing other than noting that climate change is likely to affect at least the distribution of some species (e.g. Overholtz et al 2011). Nonetheless, since most relevant species occur over wide areas of the mid and north Atlantic Ocean and inhabit both inshore and offshore pelagic waters, it is unlikely that any indirect anthropogenic activity currently substantially impacts these populations, especially in relative comparison to the direct effects on these populations as a result of fishing.

In the near future an Omnibus Observer Amendment will specify ways that Councils can develop industry-funded observer programs, which should further assist efforts to evaluate and reduce bycatch and undesired incidental catch. These improvements, along with past management practices are expected to result in non-significant, neutral to slightly positive cumulative impacts for non-target species.

7.7 Summary of cumulative impacts

The impacts of the preferred alternatives on the biological, physical, and human environment are described in section 7. The overall implementation of the measures considered via this document are expected to generate positive impacts. These impacts will be felt most strongly in the social and economic dimension of the environment. These benefits are also summarized in the Initial Regulatory Flexibility Analysis at the end of this document. Indirect benefits of the preferred alternatives are likely to affect consumers and in areas of the economic and social environment that interact in various ways with these fisheries. The proposed actions, together with past and future actions are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment. As long as management continues to prevent overfishing and rebuild overfished stocks, the fisheries and their associated communities should continue to benefit. As noted above, the historical development of the FMP resulted in a number of actions which have impacted these fisheries and other valued ecosystem components. The cumulative effects of past actions in conjunction with the proposed measures and possible future actions are discussed above. Within the construct of that analysis, the Council has concluded that no significant cumulative impacts will result from the proposed specifications.

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

8.1 Magnuson-Stevens Fishery Conservation and Management Act

8.1.1 NATIONAL STANDARDS

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

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

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The measures proposed via this document are designed to avoid acceptable biological catch overages (i.e. avoid overfishing) while also allowing the fishery to achieve the specified quotas, i.e. optimum yield.

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

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

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

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

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

The proposed management measures are not expected to discriminate between residents of different States. This action does not allocate or assign fishing privileges among various fishermen.

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

The proposed measures should not impact the efficiency of utilization of fishery resources. They are designed to continue the effective management and utilization of mackerel, squid, and butterfish resources.

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

Changes in fisheries occur continuously, both as the result of human activity (for example, new technologies or shifting market demand) and natural variation (for example, oceanographic perturbations). Recent stock assessments have suggested that the mackerel, squid, and butterfish stocks are all likely particularly sensitive to environmental variables. In order to provide the greatest flexibility possible for future management decisions, the fishery management plan includes a Framework adjustment mechanism with an extensive list of possible Framework adjustment measures that can be used to quickly adjust the plan as conditions in the fishery change.

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

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

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

The human community impacts of the action are described above in Section 7 and predicted to be positive. The reduction of the mackerel quota means a potential reduction in possible revenues, but the Council's SSC determined that a catch reduction was appropriate for conservation of the mackerel stock. While the proposed river herring and shad cap reduction may limit mackerel fishing in the short term, the Council determined that the potential benefits for river herring and shad conservation warranted such limits. Also, if the mackerel fishery can achieve a relatively low river herring/shad interaction rate they will still be able to catch their full quota. Other proposed measures either maintain the status quo (squids) or raise catch limits (butterfish).

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

The Magnuson-Stevens Act defines "bycatch" as fish that are harvested in a fishery, but are not retained (sold, transferred, or kept for personal use), including economic discards and regulatory discards. Incidentally landed catch are fish, other than the target species, that are harvested while fishing for a target species and retained and/or sold. The river herring and shad cap may reduce interactions with these species in the mackerel fishery, and therefore discards of these species (though most are usually retained when caught). Previous actions have reduced bycatch in the squid fisheries to the extent practicable. It is not expected that the proposed increase to the butterfish catch will increase bycatch overall, but as the fishery redevelops observer data will be analyzed to determine if any future bycatch minimization measures are appropriate.

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

Fishing is a dangerous occupation; participants must constantly balance the risks imposed by weather against the economic benefits. According to the National Standard guidelines, the safety of the fishing vessel and the protection from injury of persons aboard the vessel are considered the same as "safety of human life at sea. The safety of a vessel and the people aboard is ultimately the responsibility of the master of that vessel. Each master makes many decisions about vessel maintenance and loading and about the capabilities of the vessel and crew to operate safely in a variety of weather and sea conditions. This national standard does not replace the judgment or relieve the responsibility of the vessel master related to vessel safety. No measures in this action are expected to impact safety at sea.

8.1.2 OTHER REQUIRED PROVISIONS OF THE MAGNUSON-STEVENS ACT

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

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

The Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan has evolved over time through 14 Amendments and currently uses Acceptable Biological Catch recommendations from the Council's Scientific and Statistical Committee to sustainably manage the Mackerel, Squid, and Butterfish fisheries. Under the umbrella of limiting catch to the Acceptable Biological Catch, a variety of other management and conservation measures have been developed to meet the goals of the fishery management plan and remain consistent with the National Standards. The current measures are codified in the Code of Federal Regulations (50 C.F.R. § 648 Subpart B - http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=1e9802ffddb05d0243d9c657fade956c&rgn=div5&view=text&node=50:12.0.1.1.5&idno=50) and summarized at http://www.nero.noaa.gov/regs/infodocs/msbinfosheet.pdf. This action proposes MSB Acceptable Biological Catches that should be sustainable and a river herring and shad cap to reduce non-target interactions in the mackerel fishery. As such, the existing and proposed management measures should continue to promote the long-term health and stability of the fisheries consistent with the MSA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Section 7.4 of this document provides an assessment of the likely effects on fishery participants and communities from the considered actions.

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

Amendments 8 and 9 to the fishery management plan established biological reference points for the species in the plan, and Amendment 10 contained measures for butterfish rebuilding. If a fishery is declared overfished or if overfishing is occurring, another Amendment would be undertaken to implement effective corrective measures. A pending framework will also facilitate rapid incorporation of new overfished/overfishing reference points.

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

NMFS is currently developing an omnibus amendment to implement a new standardized reporting methodology since the previous methodology was invalidated by court order. See http://nero.noaa.gov/mediacenter/2013/09/draftsbrmamendment.html for details.

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

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

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

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

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

No rebuilding plans are active (or necessary). The proposed reduction in the mackerel catch is prorated against the recreational and commercial allocations.

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

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

8.1.3 Discretionary Provisions of the Magnuson-Stevens Act

Section 303b of the Magnuson-Stevens Act contains 14 additional discretionary provisions for Fishery Management Plans. They may be read on pages of 59 and 60 of National Marine Fisheries Service's redline version of the Magnuson-Stevens Act at: http://www.nmfs.noaa.gov/msa2007/MSA_Amended%20by%20Magnuson-Stevens%20Reauthorization%20Act%20%281-31-07%20draft%29.pdf. Given the limited scope of this action, there are no significant impacts related to such provisions except provision 12: "include management measures in the plan to conserve target and non-target species and habitats, considering the variety of ecological factors affecting fishery populations." The river herring and shad cap is rooted in the mandate to reduce bycatch as well as this discretionary provision since river herring and shad are not targeted by the mackerel fishery.

8.1.4 Essential Fish Habitat Assessment

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

8.2 NEPA

8.2.1 Finding of No Significant Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. '1508.27 state that the significance of an action should be analyzed both in terms of context and intensity. Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the Administrative Order 216-6 criteria and Council on Environmental Quality's context and intensity criteria. These include:

1) *Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action*?

None of the proposed specifications are expected to jeopardize the sustainability of any target species affected by the action (see section 7 of this document). The proposed quota specifications under the preferred alternatives for each species are consistent with the FMP and best available scientific information. As such, the proposed action is expected to ensure the long-term sustainability of harvests from the MSB stocks.

2) *Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species*?

The proposed action is not expected to jeopardize the sustainability of any non-target species (see section 7 of this document) because the proposed specifications are not expected to result in substantial increases in overall fishing effort. In addition, none of the measures are expected to substantially alter fishing methods or the temporal and/or spatial distribution of fishing activities. Therefore, none of the proposed actions are expected to jeopardize the sustainability of non-target species. The butterfish cap, which began in 2011, should continue to reduce bycatch of butterfish and may reduce bycatch of other species if the cap closes the longfin squid fishery earlier than would have otherwise occurred or the fishery proactively avoids bycatch. The same is likely to be true related to the river herring/shad (RH/S) cap specifications that are being set in this document for the mackerel fishery. There should be specific benefits to RH/S and general bycatch benefits if mackerel closes because of the cap. The rejuvenation of the butterfish fishery will continue to be examined to see if it causes any issues with non-target species that require mitigation.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Act and identified in FMPs?

The proposed action is not expected to cause damage to the ocean, coastal habitats, and/or EFH as defined under the Magnuson-Stevens Act and identified in the FMP (see Section 7). In general, bottom-tending mobile gear, primarily otter trawls, which are used to harvest mackerel, squid, and butterfish, have the potential to adversely affect EFH for the benthic lifestages of a number of species in the Northeast region that are managed by other FMPs. However, because none of the management

measures proposed in this action should cause any substantial increase in overall fishing effort relative to the status quo, they are not expected to have any substantial negative impact on EFH or on coastal and ocean habitats.

4) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

None of the measures substantially alter the manner in which the industry conducts fishing activities for the target species. Therefore, the proposed actions in these fisheries are not expected to adversely impact public health or safety.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

The MSB fisheries are known to interact with common and white sided dolphins and pilot whales. Fishing effort is not expected to substantially increase in magnitude under the proposed specifications. In addition, none of the proposed measures are expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Therefore, this action is not expected to have increased negative effects on common and white sided dolphin and pilot whales. The mackerel, *Illex* and butterfish fisheries are not known to substantively interact with any endangered or threatened turtle species or their critical habitat. The longfin squid fishery has been known to have interactions with loggerhead, green, and leatherback sea turtles as discussed in section 6.4. The proposed action is not expected to substantially increase fishing effort or substantially alter fishing patterns in a manner that would adversely affect these endangered species of sea turtles.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

These fisheries are prosecuted using bottom otter trawls, which have the potential to impact bottom habitats. In addition, a number of non-target species are taken incidentally to the prosecution of these fisheries. However, fishing effort is not expected to substantially increase in magnitude under the proposed specifications (see section 7.0 of this document). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort. Therefore, the proposed action is not expected to have a substantial impact on biodiversity or ecosystem function (e.g. food webs) within the affected area. The proposed increased butterfish catch limits account for their role as forage in the butterfish overfishing definition.

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

The action proposed addresses the mackerel, squid, and butterfish fishery specifications process, which was established in the FMP and modified in various amendments, frameworks, and specifications. There are no significant social or economic impacts interrelated with natural or physical environmental effects expected from implementation of this action. A complete discussion of the potential impacts of the proposed specifications and management measures is provided in Section 7 of this document.

8) Are the effects on the quality of the human environment likely to be highly controversial?

The proposed action is based on measures contained in the FMP which have generally been in place for many years. In addition, the scientific information upon which the annual quotas for managed species are based has been reviewed by the Council's SSC and is the most recent information available. As a result of these facts, the specifications proposed herein are not expected to be controversial. The cap for RH/S was analyzed in Amendment 14 and additional details on the development of the RH/S cap may be found there.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

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

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

While there is always a degree of variability in the year to year performance of the relevant fisheries, the proposed actions are not expected to substantially increase overall effort or to substantially alter fishing methods and activities. As a result, the effects on the human environment of the proposed specifications are not highly uncertain nor do they involve unique or uncertain risks (see section 7.0 of this document).

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

The impacts of the preferred alternatives on the biological, physical, and human environment are described in section 7.0. The overall interaction of the proposed action with other actions are expected to generate positive impacts, but are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

The action proposed addresses the mackerel, squid, and butterfish fishery specifications process, which was established in the FMP and modified in various amendments, frameworks, and specifications. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels typically avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternative would adversely affect the historic resources listed above.

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

There is no evidence or indication that these fisheries have ever resulted or would ever result in the introduction or spread of nonindigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

The proposed action has been proposed and evaluated consistent with prior year's specification setting processes and/or amendments and therefore is neither likely to establish a precedent for future actions with significant effects nor to represent a decision in principle about a future consideration.

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Overall fishing effort is not expected to substantially increase in magnitude under the proposed action (see section 7.0 of this document). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities, or the spatial and/or temporal distribution of fishing effort. Thus, it is not expected that they would threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The proposed measures have been found to be consistent with other applicable laws as described in this Section.

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Overall fishing effort is not expected to substantially increase in magnitude under the proposed action (see section 7.0 of this document). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort. Therefore the proposed action is unlikely to result in cumulative adverse effects (including any that could have a substantial effect on the target species or non-target species).

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for the mackerel, squid, and butterfish fisheries, it is hereby determined that the proposed specifications will not significantly impact the quality of the human environment as described 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 EIS for this action is not necessary.

Greater Atlantic Regional Administrator, NOAA

2/23/15
Date

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8.3 Marine Mammal Protection Act

The various species which inhabit the management unit of this FMP that are afforded protection under the Marine Mammal Protection Act of 1972 (MMPA) are described in Section 6.4. Four species of marine mammals are known to interact with the mackerel, squid and butterfish fisheries - long and short finned pilot whales, common dolphin and white sided dolphin. None of the specifications are expected to significantly alter fishing methods or activities or result in substantially increased effort. The Council has reviewed the impacts of the proposed specifications on marine mammals and concluded that the management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management units of the subject fisheries. For further information on the potential impacts of the fishery and the proposed management action, see Sections 6 and 7 of this Environmental Assessment.

8.4 Endangered Species Act

Section 7 of the ESA requires Federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The Council has concluded that the proposed specifications and the prosecution of the associated fisheries are not likely to result in jeopardy to any ESA-listed species under NOAA Fisheries Service jurisdiction, or alter or modify any critical habitat, based on the analysis in this document. For further information on the potential impacts of the fisheries and the proposed management action, see Sections 6.4 and 7 of this document.

Formal consultation on the MSB fishery was last completed on October 29, 2010. The October 29, 2010, Biological Opinion concluded that the operation of the MSB fishery is not likely to jeopardize the continued existence of listed species. An ESA Section 7 consultation for 2012 MSB Specifications was completed on September 9, 2011. The consultation concluded that the proposed specification measures do not constitute a modification to the operations of the MSB fisheries under the FMP that would cause an effect to ESA-listed species or critical habitat not considered in the October 29, 2010 Biological Opinion.

NMFS reinitiated consultation on seven fisheries, including the MSB FMP and finalized a biological opinion in December 2013 (http://www.greateratlantic.fisheries.noaa.gov/protected/section7/bo/actbo.html). NMFS determined that:

> "After reviewing the current status of the species, the environmental baseline, climate change, cumulative effects in the action area, and the effects of the continued operation of the seven fisheries under their respective FMPs over the next ten years, it is our biological opinion that the proposed action may adversely affect, but is not likely to jeopardize, the continued existence of North Atlantic right whales, humpback whales, fin whales, and sei whales, or loggerhead (specifically, the NWA DPS), leatherback, Kemp's ridley, and green sea turtles, any of the five DPSs of Atlantic sturgeon, or GOM DPS Atlantic salmon. It is also our biological opinion that the proposed action is not likely to adversely affect hawksbill sea turtles, shortnose sturgeon, smalltooth sawfish DPS, *Acroporid* corals, Johnson's seagrass, sperm whales, blue whales, designated critical habitat for right whales in the Northwest Atlantic, or designated critical habitat for GOM DPS Atlantic salmon."

8.5 Administrative Procedures Act

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

8.6 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. This action does not propose to modify any existing collections, or to add any new collections; therefore, no review under the Paperwork Reduction Act is necessary.

8.7 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to the Coastal Zone Management Act regulations at 15 CFR 930.35, a negative determination may be made if there are no coastal effects and the subject action: (1) Is identified by a state agency on its list, as described in ' 930.34(b), or through case-by-case monitoring of unlisted activities; or (2) which is the same as or is similar to activities for which consistency determinations have been prepared in the past; or (3) for which the Federal agency undertook a thorough consistency assessment and developed initial findings on the coastal effects of the activity. Accordingly, NMFS has determined that this action would have no effect on any coastal use or resources of any state. Letters documenting the NMFS negative determination, along with this document, were sent to the coastal zone management program offices of the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. A list of the specific state contacts and a copy of the letters are available upon request.

8.8 Section 515 (Data Quality Act)

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

Utility

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

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

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

Integrity

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

Objectivity

For purposes of the Pre-Dissemination Review, this document is considered to be a Natural Resource Plan. Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, FMP Process; the EFH Guidelines; the National Standard Guidelines; and

NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

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

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the proposed action were conducted using information from the most recent complete calendar years, generally through 2013 except as noted. The data used in the analyses provide the best available information on the number of seafood dealers operating in the northeast, the number, amount, and value of fish purchases made by these dealers. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to these fisheries.

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

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

8.9 Regulatory Flexibility Analysis

The purpose of the Regulatory Flexibility Act is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the Regulatory Flexibility Act requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. To this end, this document contains an Initial Regulatory Flexibility Analysis, found at section 12.0 at the end of this document, which includes an assessment of the effects that the proposed action and other alternatives are expected to have on small entities.

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

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

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

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

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10.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this annual specifications analysis the Council consulted with the NMFS, New England and South Atlantic Fishery Management Councils, Fish and Wildlife Service, Department of State, and the states of Maine through Florida through their membership on the Mid-Atlantic, New England and /or South Atlantic Fishery Management Councils. In addition, states that are members within the management unit were be consulted through the Coastal Zone Management Program consistency process. Letters were sent to each of the following states within the management unit reviewing the consistency of the proposed action relative to states' Coastal Zone Management Programs: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia and Florida.

11.0 LIST OF PREPARERS AND POINT OF CONTACT

This environmental assessment was prepared by the following member of the Council staff: Jason Didden. Questions about this environmental assessment or additional copies may be obtained by contacting Jason Didden, Mid-Atlantic Fishery Management Council, 800 N. State Street, Dover, DE 19901 (302-674-2331). This Environmental Assessment may also be accessed by visiting the NMFS Northeast Region website at http://www.nero.noaa.gov/regs/.

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12.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS AND REGULATORY IMPACT REVIEW

12.1 Initial Regulatory Flexibility Analysis

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

The RFA emphasizes predicting significant adverse impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts, while still achieving the stated objective of the action. 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 declaration 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 (IRFA) that describes the impact of the proposed rule on small entities.

This document provides the factual basis supporting a certification that the proposed regulations will not have a "significant impact on a substantial number of small entities" and that an IRFA is not needed in this case. Certifying an action must include the following elements, and each element is subsequently elaborated upon below:

A. A statement of basis and purpose of the rule
B. A description and estimate of the number of small entities to which the rule applies
C. Description and estimate of economic impacts on small entities, by entity size and Industry
D. An explanation of the criteria used to evaluate whether the rule would impose significant economic impacts
E. An explanation of the criteria used to evaluate whether the rule would impose impacts on a substantial number of small entities
F. A description of, and an explanation of the basis for, assumptions used

<u>A – Basis and purpose of the rule</u>

The bases of the rules proposed in this action are the provisions of the MSA for federal fishery management to prevent overfishing, achieve optimum yield, reduce bycatch to the extent practicable, and conserve non-target species. Optimum yield is defined as the amount of fish which will achieve the maximum sustainable yield, as reduced by any relevant economic, social, or ecological factor. The purpose of the rules associated with Alternative Sets 1,3,4, and 5 is to implement specifications for the MSB fisheries that institute quotas and related measures that will restrict catch so as to avoid overfishing while facilitating catch within the constraint of avoiding overfishing such that optimum

yield is achieved. The purpose of the rules associated with Alternative Set 2 is to implement specifications for the RH/S cap for the mackerel fishery so as to conserve RH/S populations. Failure to implement the preferred measures described in this document could result in overfishing, stock depletion, failure to reach optimum yield and/or undermining of conservation of RH/S, a non-target catch in the mackerel fishery. To assist with further evaluation of the measures proposed in this document, a brief summary of the preferred alternatives is provided next. A full description of all alternatives is provided in Section 5.

Alternative Set 1 – Alternative 1b is preferred. It proposes to change the current mackerel specifications such that the commercial quota would be reduced from 33,821 mt to 20,872 mt for 2015. The commercial quota is technically known as the domestic annual harvest (DAH) and directed fishing is curtailed as the quota is approached. The recreational catch target would be lowered from 2,443 mt to 1,397 mt but no additional restrictions are proposed for the recreational fishery since recreational catches have been low in recent years (see section 6).

Alternative Set 2 – Alternative 2b is preferred. It proposes to change the current RH/S cap specifications such that the cap would be lowered from 236 mt to a two phase 89/155 mt cap for 2015.

Alternative Set 3 - Alternative 3a is preferred. It proposes to maintain the current *Illex* squid specifications for 2015-2017 (commercial quota = 22,915 mt). There is no recreational fishery.

Alternative Set 4 - Alternative 4b is preferred. It proposes to change the current butterfish specifications such that the commercial quota would be increased from 3,200 mt to 20,652 mt - 22,530 mt 2015-2017, and the cap on butterfish discards in the longfin squid fishery would remain the same (3,884 mt). There is no recreational fishery.

Alternative Set 5 - Alternative 5a is preferred. It proposes to maintain the current longfin squid specifications for 2015-2017 (commercial quota = 22,445 mt). There is a minimal recreational longfin squid fishery that is not regulated.

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

The measures proposed in this action apply to the vessels that hold limited access permits for the MSB fisheries. There are also incidental permits that allow small-scale landings, and more vessels hold incidental permits, but landings of MSB species by incidental permit holders are relatively minor and no changes are proposed for the incidental trip limits.

Many MSB-permitted vessels hold multiple permits and some small entities own multiple vessels with limited access MSB permits. Staff queried NMFS databases for 2013 MSB limited access permits, and then cross-referenced those results with ownership data provided by the Social Science Branch of NMFS' Northeast Fisheries Science Center. This analysis found that 384 separate vessels hold MSB limited access permits, 287 entities own those vessels, and based on current SBA definitions, 274 are small entities. All of the entities that had revenue fell into the finfish or shellfish categories, and the SBA definitions for those categories for 2014 are $20.5 million for finfish fishing and $5.5 million for shellfish fishing. Of the 274 small entities, 29 had no revenue in 2013 and those entities with no revenue are listed as small entities for the purposes of this analysis.

The only proposed alternatives that involve increased restrictions (1b, 2b) apply to mackerel limited

access permits so those numbers are listed separately (they are a subset of the above entities). This analysis found that 150 separate vessels hold mackerel limited access permits, 114 entities own those vessels, and based on current SBA definitions, 107 are small entities. Of the 107 small entities, 4 had no revenue in 2013 and those entities with no revenue are listed as small entities for the purposes of this analysis. Of the entities with revenues, their average revenues in 2013 were $1,201,419. 70 had primary revenues from finfish fishing and 33 had their primary revenues from shellfish fishing.

C – Description and estimate of economic impacts on small entities

Alternative 1b should have no negative impacts on any of the relevant entities compared to recent operation of the fishery (2011-2013, and 2014's landings to date appear similar to 2013's). Even though the proposed 2015 quota is lower than 2014, it would still allow more than a tripling of catch compared to any year 2011-2013.

Alternative 2b should not have more than minimal impact on any of the relevant entities compared to recent operation of the fishery (2011-2013, and 2014's landings to date appear similar to 2013's). Based on the operation of the cap in 2014 (the first year of the cap), as long as the fishery can maintain relatively low RH/S catch rates, 2b should not constrain the fishery so it should not negatively impact fishery participants. The industry has also been actively participating in a voluntary avoidance program that should help to keep RH/S catches low. Examination of RH/S catch rates in 2011-2013 suggest that the only year that the proposed cap under 2b would have been binding would have been 2012. In 2012, relevant trips landed 5074 mt of mackerel, but the fishery would have closed at approximately 4,439 mt (had the proposed cap been in place then). Given the RH/S encounter rate in 2012, i.e. about 608 mt of mackerel landings would have been forgone. 608 mt of mackerel at 2013 prices amounts to $265,105 of potentially forgone mackerel in terms of ex-vessel revenues. However, based on the actual operation of the cap in 2014, actual RH/S catch rates may be lower under the cap and therefore the cap may not be binding (which is the goal).

Alternative 3a proposes to extend the current 2014 *Illex* squid specifications for 2015-2017, so there should be no negative impacts on any of the relevant entities.

Alternative 4b proposes to increase the butterfish quotas from 3,200 mt in 2014 to 20,652 mt - 22,530 mt 2015-2017, and the cap on butterfish discards in the longfin squid fishery would remain the same (3,884 mt). Accordingly, there should be no negative impacts on any of the relevant entities. Under 4b, the landings limits (DAH) are similar each year and the average landings limit for 2015-2017 would be 21,408 mt. This would be 18,208 mt larger than the 2014 limit, which could potentially translate into approximately $31.7 million additional ex-vessel revenues at 2013 prices.

Alternative 5a proposes to extend the current 2014 longfin squid specifications for 2015-2017, so there should be no negative impacts on any of the relevant entities.

D/E – An explanation of the criteria used to evaluate whether the rule would impose significant economic impacts/ An explanation of the criteria used to evaluate whether the rule would impose impacts on a substantial number of small entities

The only alternative that would appear to have the potential to cause any adverse impacts is 2b. Over 2011-2013 the proposed specification of the cap would have only caused a closure in one year, and

caused $265,105 of potentially forgone mackerel in terms of ex-vessel revenues. Averaged over the 103 entities that had revenues in 2013, this amounts to $2,574 per entity. This compares with an average revenue of $1,201,419 for those entities in 2013. As such, the impacts do not appear likely to be significant relative to recent fishery operation even if RH/S catch rates are relatively high relative to 2011-2013. The 608 mt of mackerel that would have been forgone in 2012 can also be analyzed from a trip perspective. From 2011-2013 there were 37 trips that landed greater than 100 mt on a trip and the average for those trips was 209 mt with a maximum of 400 mt. Thus 608 mt might amount to just 2-3 directed trips, which means that relative to recent operation of the fishery, only a few entities would likely be impacted even if RH/S catch rates are relatively high.

F – A description of, and an explanation of the basis for, assumptions

Other than those described directly in the above analyses, the primary assumption utilized in the above analyses is that comparing likely 2015 fishery operation to how the fishery operated over 2011-2013 is appropriate. Using the most recent three years of fishery operation is standard practice for Regulatory Flexibility Analysis and there is no indication that such an approach is contraindicated in this case since doing so captures what the industry has recently experienced versus potential impacts going forward from implementation of the proposed specifications.

12.2 Regulatory Impact Review

INTRODUCTION

Executive Order 12866 requires a Regulatory Impact Review (RIR) in order to enhance planning and coordination with respect to new and existing regulations. This Executive Order requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section 7 assesses of the costs and benefits of the Proposed Action and found the impacts to be mostly neutral or positive. The analysis included in this RIR further demonstrates that this action is not a "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy.

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

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

2* Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

3* Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the

rights and obligations of recipients thereof; or

4* Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

OBJECTIVES

The objectives of the MSB FMP are as follows:

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

Consistent with these objectives, these specifications seek to facilitate landings consistent with avoiding overfishing and also minimizing bycatch, which has been an important consideration in Council actions for this fishery in recent years.

AFFECTED ENTITIES

A description of the entities affected by this action is provided in section 12.1 above, and Section 6.6 provides additional detail on participation in the MSB fisheries.

PROBLEM STATEMENT

The purpose of the measures proposed in this action are described in Section 4 of this document. The purpose of this action is to set specifications for the MSB fisheries, including the butterfish cap for the longfin squid fishery and the RH/S cap for the mackerel fishery. This action is needed to prevent overfishing and achieve optimum yield in the MSB fisheries, while controlling discards (bycatch) of butterfish and the incidental (non-target) catch of RH/S.

ANALYSIS OF ALTERNATIVES

Executive Order 12866 mandates that proposed measures be analyzed below in terms of: (1) changes in net benefits and costs to stakeholders, (2) changes to the distribution of benefits and costs within the industry, (3) changes in income and employment, (4) cumulative impacts of the regulation, and (5) changes in other social concerns. As described in Section 7, the proposed specifications should have neutral revenue impacts for the squids (maintain current measures) and positive revenue impacts for butterfish (catches are proposed to be increased related to new assessment). The mackerel landings limit is proposed to decrease, but mackerel landings have been well below even the new limit in recent

years so minimal impacts would be expected. The RH/S cap is also proposed to be lowered, but again mackerel landings have been low in recent years, and in the first year of the RH/S cap the fleet avoided RH/S so they were not impacted. If similar RH/S encounter rates occur, the mackerel fishery will continue to not be impacted by even the lower RH/S cap. 2013 landings revenues totaled less than $2 million and landings have been less than 4 million over 2010-2013. The low levels of activity in the mackerel fishery in recent years, the possibility that the mackerel fishery may not be impacted at all by the lower allowed mackerel and RH/S catch levels, and the neutral/positive impacts for squids/butterfish support a determination that this action is not significant for purposes of Executive Order 12866.

There should not be substantial distributional issues (all permit holders are impacted similarly), and impacts on income and employment should mirror the impacts on fishing revenues described above (i.e. should be relatively minor). As described in Section 7, the Council has concluded that no significant cumulative impacts will result from the proposed specifications. There are no other expected social concerns.

DETERMINATION OF EXECUTIVE ORDER 12866 SIGNIFICANCE

Given the analysis in Section 7 and summary information above, the action overall should have neutral to low-positive impacts on participants in the MSB fisheries. In addition, there should be no interactions with activities of other agencies and no impacts on entitlements, grants, user fees, or loan programs. The proposed action is also similar to actions taken each year that set MSB specifications, and as such does not raise novel legal or policy issues. As such, the Proposed Action is not considered significant as defined by Executive Order 12866.

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