Small-Mesh Multispecies
Fishing Year 2015-2017 Specifications
Environmental Assessment
Regulatory Impact Review
and
Initial Regulatory Flexibility Analysis

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Prepared by the
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1.0 EXECUTIVE SUMMARY

The proposed action would make two changes to existing catch limits and management measures. One change (described in Section 5.1) proposes to adjust catch specifications, applying the latest assessment of stock size using updated information on catch and survey biomass through calendar year 2013 (and spring 2014 survey data for northern red hake). The other change (described in Section 5.2) is proposed to modify northern red hake possession limits and/or AM triggers to reduce the risk of continuing northern red hake overfishing and make a correction for a prior error in 2012-2014 specifications.

Section 3.0 summarizes the purpose and need for taking action, while Section 5.0 includes a description of and rational for the alternatives. Section 4.0 summarizes the management background, including a description of the ACL framework that was adopted in Amendment 19 to the Northeast Multispecies FMP to set specifications for red, silver, and offshore hake. Section 6.0 summarizes the Affected Environment and outlines the Valued Environmental Components (VECs) that are used to describe the impacts of the proposed alternatives in Section 5.0. These VECs include 1) red hake stocks, 2) stocks of northern silver hake and southern whiting, 3) non-target species and bycatch, 4) physical environment and essential fish habitat, 5) protected resources, and 6) fishery related businesses and communities. The cumulative effects of the preferred alternative and other regulations are discussed in Section 7.7. Section 8.0 discusses compliance of this action with applicable laws.

1.1 Decision Matrix

1.1.1 Specifications

There are two alternatives for setting specifications for small-mesh multispecies: an update based on the best available science that accounts for recent changes in stock biomass and catch, and No Action which would retain the existing specifications.

The proposed change in specifications is listed in the table below.

Table 1. Proposed Specifications for 2015-2017 fishing years.

Stock	OFL (mt)	ABC (mt)	ACL (mt)	Change	Discard rate	TAL	Change
Northern silver hake	43,608	24,383	23,161	85.0%	11.2%	19,948.7	122.3%
Northern red hake	331	287	273	2.6%	60.6%	104.2	15.4%
Southern silver hake	60,148	31,180	29,621	-8.2%	17.1%	23,833.4	-12.6%
Southern red hake	3,400	3,179	3,021	-2.4%	55.3%	1,309.4	-2.0%

OFL = Overfishing Limit
ABC = Acceptable Biological Catch
TAL = Total Allowable Landings

Impacts on the VECs are summarized in the table below and discussed in more detail in Section 7.0. In general, the ACL specifications are intended to prevent overfishing and hence have positive, insignificant effects compared to baseline environmental conditions. Except for northern red hake, catch is generally constrained by restrictive regulations to avoid unacceptable bycatch and market forces, so changes in the ACL specifications generally have positive effects. When the No Action alternative has higher catch

limits than the preferred alternative for some stocks, it is expected to have a negative biological impact because the risk of overfishing would be higher with No Action. When this action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in these past FMP documents and this document, there are no significant cumulative effects associated with the preferred alternatives in this document (Table 22).

VEC impacts	Updated specifications Section 5.1.1	No Action Section 5.1.2
Red hake stocks **Section 7.1.1**	North: Low negative South: Low positive	North: Low positive South: Neutral
Silver and offshore hake stocks **Section 7.2.1**	North: Neutral South: Low positive	North: Neutral South: Low negative
Non-target species and bycatch **Section 7.3.1**	Neutral	Positive
Physical environment and essential fish habitat **Section 7.4.1**	Neutral	Neutral
Protected resources **Section 7.5.1**	Neutral	Neutral
Fishery-related businesses and communities **Section 7.6.1**	Low positive	Positive

1.1.2 Northern Red Hake Possession Limits and AM Trigger Correction

There are three alternatives for reducing the risk of continued overfishing of northern red hake and for adjusting the northern red hake accountability measure (AM) trigger. They include an alternative to reduce the northern red hake possession limit to 3,000 lbs. at the beginning of the fishing year, followed by a reduction to 1,500 lbs. when northern red hake landings reach 45% of the TAL. The AM trigger monitoring would not change, but the level would be raised from 45% of the TAL to 62% of the TAL, correcting for a previous underestimate in the specifications of northern red hake. The AM trigger determines when a 400 lbs. incidental red hake limit becomes effective to reduce that catch will exceed the ACL. A second alternative would make no change in the northern red hake possession limits, but would only correct the AM trigger to 62.5% of the TAL. The No Action alternative would make no changes in the red hake possession limits and would not correct the TAL trigger, currently set at 45% of the TAL for northern red hake and 90% of the TAL for other stocks.

Impacts on the VECs are summarized in the table below and discussed in more detail in Section 7.0. Lower possession limits and a lower AM trigger is expected to reduce targeting of red hake and fishing in areas and seasons when red hake are relatively more abundant, and vice versa. In general, shifts in fishing effort induced by these measures would be positive for northern red hake and species that are associated with areas and seasons where red hake are more abundant, and negative or neutral for silver hak e stocks and species associated with them. Alternatives where red hake catch is expected to increase would have negative impacts, and vice versa. Alternatives that extend the season with a higher red hake possession limit or have less discarding should have positive economic benefits. All the impacts are relatively small and insignificant, ranked either low negative, neutral, or low positive.

VEC impacts	Northern red hake possession limit and AM trigger Section 5.2.1	AM trigger adjustment Section 5.2.2	No Action Section 5.1.2
Red hake stocks **Section 7.1.2**	North: Low negative South: Neutral	North: Low negative South: Neutral	North: Neutral South: Neutral
Silver and offshore hake stocks **Section 7.2.2**	North: Low negative South: Neutral	North: Low positive South: Neutral	North: Neutral South: Neutral
Non-target species and bycatch **Section 7.3.2**	Mixed effect	Mixed effect	Positive
Physical environment and essential fish habitat **Section 7.4.2**	Neutral	Neutral	Neutral
Protected resources **Section 7.5.2**	Neutral	Neutral	Neutral
Fishery-related businesses and communities **Section 7.6.2**	Low negative	Low positive	Low positive

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2.4 LIST OF ACRONYMS

ABC	Annual Biological Catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission or Commission

BiOp, BO	Biological Opinion, a result of a review of potential effects of a fishery on Protected Resource species
B_{MSY}	Biomass at Maximum Sustainable Yield
CAI	Closed Area I
CAII	Closed Area II
CEA	Cumulative Effects Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPUE	Catch per unit of effort
CV	Coefficient of Variation
CZMA	Coastal Zone Management Act
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
F	Fishing Mortality Rate
FEIS	Final Environmental Impact Statement
F_{MSY}	Fishing Mortality Rate at Maximum Sustainable Yield
FR	Federal Register
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
GARFO	Greater Atlantic Regional Fisheries Office (formerly Northeast Regional Office/NERO)
GB	Georges Bank
GIS	Geographical Information System
GOM	Gulf of Maine
HAPC	Habitat Area of Particular Concern
HPTRP	Harbor Porpoise Take Reduction Plan
IRFA	Initial Regulatory Flexibility Analysis
LNG	Liquefied Natural Gas
LOA	Letter of Authorization
LOF	List of Fisheries
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistical Survey
MRIP	Marine Recreational Information Program
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
MT	Metric tons
NAO	National Oceanic and Atmospheric Administration Administrative Order
NEFSC	Northeast Fisheries Science Center
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration

OFL	Overfishing Limit
OY	Optimum Yield
PDT	Whiting Plan Development Team
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RIR	Regulatory Impact Review
SA	Three-digit Statistical Area (used to report catch)
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBA	Small Business Administration
SSC	Scientific and Statistical Committee
TAL	Total Allowable Landings
TED	Turtle Excluder Device
TMS	Ten-minute square
US	United States
USCG	US Coast Guard
VECs	Valued Ecosystem Components
VMS	Vessel Monitoring Sytem
VTR	Vessel Trip Report

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3.1 PURPOSE AND NEED

The Northeast Multispecies Fishery Management Plan (FMP) requires that the NMFS Regional Administrator, after consultation with the Council, determine the specifications for northern and southern stocks of red and silver hake at least every three years. The purpose of this action is to set red and silver hake specifications for the 2015-2017 fishing years, correct for accountability measure (AM) adjustments that were made based on a previous underestimate of the acceptable biological catch (ABC) and resultant landings limits, and consider measures that will reduce the risk of continuing overfishing of northern red hake. Amendment 19 established a process and framework for setting catch specifications, as well as set the specifications for the 2012-2014 fishing years. The small-mesh multispecies specifications are intended to meet many of the goals and objectives for this fishery by establishing catch limits that promote sustainable yield and prevent overfishing.

Changes to specifications are needed to respond to changes in stock biomass, provide for sustainable yield, and prevent overfishing. Changes to the total allowable landings (TAL) are also needed to respond to changes in the discard rate of red and silver hake. This action proposes new specifications for the 2015-2017 fishing years, derived from a stock assessment update for northern and southern red and silver hake (4 stocks). This stock assessment (NEMFC 2014) was updated with survey data through spring 2014 for red hake and through fall 2013 for silver hake. Reported landings and estimated discards were updated through calendar year 2013. (Note, offshore hake is included in the fishery, but is not currently able to be assessed. The southern silver hake stock ABCis increased by the estimated proportion (4 percent) of offshore hake in the combined "whiting" landings.)

Another need for this action is to make a correction to the northern red hake AM, which resulted from a mis-specification of the 2012-2014 ABC. The purpose of this change is to ensure that the fishery is managed as intended, without unnecessarily penalizing the fleet for a calculation error made when specifications were set under Amendment 19. Further details about why this correction is needed and why it applies only to the northern red hake specifications are provided in Section 5.2.

To address this concern about the potential for continued overfishing of northern red hake, an alternative described in Section 5.2 proposes an adjustment to the northern red hake possession limits to discourage fishermen from targeting northern red hake and to encourage fishermen to target silver hake in areas where and times when red hake are less available.

Table 2. Summary of Purpose and Need.

NEED	CORRESPONDING PURPOSE(S)
For all small mesh multispecies, modify specifications in response to changes in stock biomass to provide for sustainable yield and prevent overfishing. For red and silver hake, modify the total allowable landings in response to changes in discard rate.	Set red and silver hake specifications for 2015 – 2017 fishing years.
	Consider measures that would reduce the risk of continuing overfishing of northern red hake.
Correct the northern red hake accountability measure.	Avoid unnecessarily penalizing small-mesh multispecies fishermen for a calculation error inadvertently made when setting the 2012-2014 specifications in Amendment 19.

4.0 MANAGEMENT BACKGROUND

4.1 Management history before Amendment 19

The small-mesh multispecies fishery consists of three species: Silver hake (*Merluccius bilinearis*), red hake (*Urophycis chuss*), and offshore hake (*Merluccius albidus*). There are two stocks of silver hake (northern and southern), two stocks of red hake (northern and southern), and one stock of offshore hake, which primarily co-occurs with the southern stock of silver hake. There is little to no separation of silver and offshore species in the market, and both are generally sold under the name "whiting." Throughout the document, "whiting" is used to refer to silver hake, and offshore and silver hake combined catches.

Collectively, the small-mesh multispecies fishery is managed under a series of exemptions from the Northeast Multispecies Fishery Management Plan. The Northeast Multispecies FMP allows for a fishery that can routinely catch less than 5% of regulated[1] multispecies to be exempted from the minimum mesh size for large-mesh groundfish. In the Gulf of Maine and Georges Bank Regulated Mesh Areas (Map 1), there are six exemption areas, which are open seasonally (Table 2).

Table 3. Northern area exemption program seasons

	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Cultivator			June 15 – October 31									
GOM* Grate			July 1 – November 30									
Small I				July 15 – November 15								
Small II	– June 30								January 1 –			
Cape Cod RFT†					Sept 1 – Nov 20							
					September 1 – December 31							

* GOM = Gulf of Maine
† RFT = Raised Footrope Trawl

The Gulf of Maine Grate Raised Footrope Area (Map 1) is open from July 1 through November 30 of each year and requires the use of an excluder grate on a raised footrope trawl with a minimum mesh size of 2.5 inches. Small Mesh Areas I and II are open from July 15 through November 15, and January 1 through June 30, respectively. A raised footrope trawl is required in Small Mesh Areas I and II, and the trip limits are mesh size dependent. Cultivator Shoal Exemption Area is open from June 15 – October 31, and requires a minimum mesh size of 3 inches. The Raised Footrope Trawl Exemption Areas are open from September 1 through November 20, with the eastern portion remaining open until December 31. A raised footrope trawl, with a minimum mesh size of 2.5-inch square or diamond mesh, is required. The Southern New England and Mid-Atlantic Regulated Mesh Areas are open year-round and have mesh size dependent possession limits for the small-mesh multispecies.

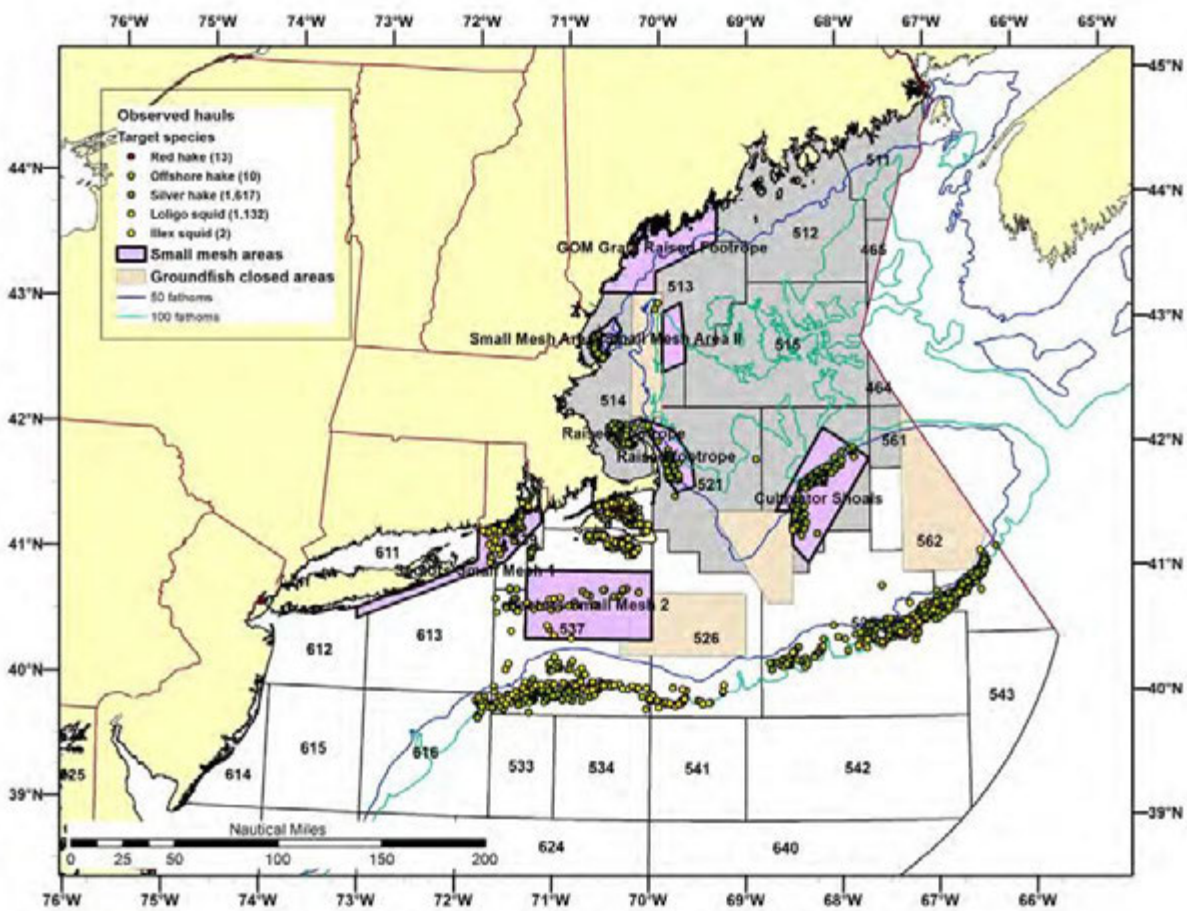
The mesh size dependent possession limits (Table 3) for all the areas with that requirement are:

Table 4. Mesh size dependent possession limits

[1] "Regulated" species are "the subset of [Northeast] multispecies that includes Atlantic cod, witch flounder, American plaice, yellowtail flounder, haddock, pollock, winter flounder, windowpane flounder, redfish, white hake, Atlantic halibut, and Atlantic wolffish. Regulated species is also referred to as regulated Northeast multispecies."

Codend Mesh Size	Silver and offshore hake, combined, possession limit	Red Hake
Smaller than 2.5”	3,500 lbs.	5,000 lbs.
Larger than 2.5”, but smaller than 3.0”	7,500 lbs.	5,000 lbs.
Equal to or greater than 3.0”	30,000 lbs. (40,000 lbs. in Southern Area)	5,000 lbs.

Map 1. Location of small-mesh fishing during 2002-2013 and exemption areas. Vessels that belong to a groundfish sector may fish for small-mesh multispecies in the two shaded exemption areas off NY, CT, and southern MA. The northern stock area is shaded grey, while the southern stock area is not shaded. The locations of groundfish closed areas shaded beige are shown for comparison.



A series of amendments and framework adjustments were adopted in the Northeast Multispecies FMP, which are or were associated with various regulations pertaining to fishing with small-mesh trawls for red, silver, and offshore hake. Amendments with measures that pertained to the small-mesh multispecies fishery were Amendments 1 (1987), 2 (1989), 4 (1991), 5 (1994), 12 (1999/200), and 19 (2012; preceded by a Secretarial Amendment). The following framework adjustments also had measures that pertained to the small-mesh multispecies fishery: 3 (1994), 6 (1994), 9 (1995), 35 (2000), 37 (2003), 38 (2003), 50 (2013), and 51 (2014). These actions and associated regulations are summarized in Amendment 19

(NEFMC 2013) and in the Stock Assessment and Fishery Evaluation (SAFE) Report for Fishing Year 2013 (NEFMC 2014). Details about each of the above actions can be found at http://www.nefmc.org/management-plans/small-mesh-multispecies.

4.2 Amendment 19 to the Northeast Multispecies FMP

Amendment 19 (NEFMC 2013) was approved by the Council in 2012 and implemented in May 2013 as a follow up to a Secretarial Amendment that included an ACL framework to comply with new requirements of the Magnuson-Stevens Act. Amendment 19 also included 2012-2014 specifications for northern stocks of red and silver hake as wells as for southern stocks of red hake and whiting (silver and offshore hake). The amendment also included in-season and post-season accountability measures to prevent overfishing and account for overages, plus an annual review and three-year setting specifications process.

The Magnuson-Stevens Act was reauthorized in January 2007 and includes several new provisions:

- *Section 302 (g) of the Magnuson-Stevens Act states: (Each Council shall) establish, maintain, and appoint the members of a scientific and statistical committee to assist it in the development, collection, evaluation, and peer review of such statistical, biological, economic, social, and other scientific information as is relevant to such Council's development and amendment of any fishery management plan…*

- *Each scientific and statistical committee shall provide its Council ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, maximum sustainable yield, and achieving rebuilding targets…*

- *Section 302 (h)(6) of the Magnuson-Stevens Act states: (Each Council shall) develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its Scientific and Statistical Committee or the peer review process established.*

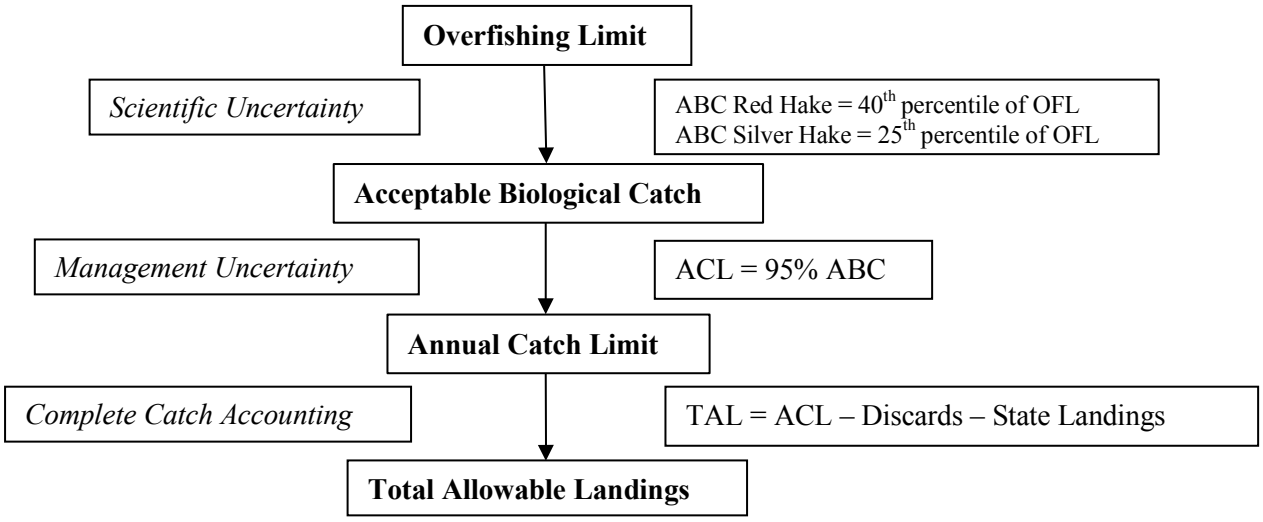
- *Section 303 (a)(15) of the Magnuson-Stevens Act states: (Any FMP shall) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.*

NMFS has provided input on what these new requirements may entail through Agency guidance on how Councils can comply with National Standard 1 and the new Magnuson-Stevens Act requirements. NMFS published a Final Rule with guidelines on complying with the Magnuson-Stevens Act and National Standard 1, including the implementation of annual catch limits and accountability measures, on January 16, 2009.

4.3 Formulas for Specifications

The process and formulae for developing specifications for red, silver, and offshore hake (target species for the small-mesh multispecies fishery) are described in §648.90(b). The regulations provide for an annual review and three-year specification process where the Council sets specifications for at least a three-year period, using best available science. The specifications for each stock include an overfishing limit (OFL), which is associated with maximum sustainable yield (MSY); an Acceptable Biological Catch (ABC), which accounts for scientific uncertainty; an Annual Catch Limit (ACL), which accounts for management uncertainty; and a Total Allowable Landings (TAL) limit that accounts for discards and catch by state-only permitted vessels.

This ACL framework, including the OFLs and ABCs, is illustrated below:



The OFL is derived from the average exploitation rate during a period that is considered to represent conditions that generated MSY. Adopted in the last benchmark assessment (SAW 51, NEFSC 2011), these baseline reference periods were 1980-2009 for red hake and 1973-1982 for silver hake. These average exploitation rates derived from the assessments were applied to the most recent three-year moving average biomass estimates gives the OFL (in mt) that is consistent with current stock conditions.

Precision (or conversely, scientific uncertainty) is estimated and a level of precaution was selected in Amendment 19 to account for scientific uncertainty. For red hake, the 40th percentile of the distribution of scientific uncertainty estimates was chosen as an appropriate level of precaution. For silver hake, a more conservative 25th percentile was chosen. This buffer between the OFL and ABC will vary with the degree of scientific uncertainty (getting smaller with greater amounts of precision in the estimates). In Amendment 19, the Council also chose a 5% buffer to account for management uncertainty to set the ACL. A three-year average discard rate (discards/catch) is applied for each stock to set the TAL, after deducting an assumed 3% catch for state-only permitted vessels.

Details about the estimation procedures and values derived from the latest stock assessment are given in the SAFE Report for the 2013 fishing year (NEFMC 2014).

4.4 Objectives

The Council's objective is to manage fisheries catching red, silver, and offshore hake that maintain stock size at levels capable of sustaining MSY on a continuing basis. In addition to existing restrictions on fishing through exemption areas and seasons to minimize groundfish bycatch, other measures are intended to optimize size selectivity and keep landings from temporarily flooding limited market demand. These measures include red and silver hake possession limits. The silver hake possession limits are higher when a vessel uses large mesh, providing an incentive to avoid catching juvenile or small silver hake. Amendment 19 established and specified catch and landings limits which are deemed to be sustainable, including accountability measures which either reduce the risk that catches will exceed the ACL or to account for those overages in later seasons if they do occur.

5.0 ALTERNATIVES UNDER CONSIDERATION

5.1 ACL Specifications

5.1.1 Updated Specifications (preferred)

Limits on fishing year catches for northern and southern stocks of red and silver hakes would be revised to be consistent with changes in stock biomass (indexed by a 3-year moving average of the stratified mean survey biomass), changes in the assessment of scientific uncertainty (i.e., precision of the survey biomass), and changes in the estimated discard rate.

The OFL is a catch level (commercial landings and discards) that has a 50% probability of causing overfishing (i.e., mortality above the approved MSY proxy). Accounting for scientific uncertainty, the ABC is a catch level that has a low probability of causing overfishing. The silver hake ABC is set at the 25th percentile of scientific uncertainty and the red hake ABC is set at the 40th percentile of the estimate of scientific uncertainty[2]. The specifications for southern silver hake were increased by 4% to account for traditional mixed catches of silver and offshore hake. Offshore hake is a managed small-mesh multispecies, but, lacking a viable analytical assessment and MSY estimate, is managed as a component of the targeted southern whiting fishery. The ACL is 95% of the ABC to account for management uncertainty (e.g. inaccuracies in monitoring catch). The parameters for these specifications remain unchanged from what was analyzed and approved in Amendment 19. Only the values changed in response to updating the stock assessment through 2013.

The TAL is reduced from the ACL to account for discards by federally-permitted vessels and catches by state-permitted vessels fishing in state waters. Following the framework established in Amendment 19 (Section 4.3), the discard rate (shown in the table below) was re-estimated for the most recent three-year period (calendar year 2011[3], fishing year 2012, and fishing year 2013). Using the estimates for Amendment 19, catches by state waters fishing was assumed not to exceed three percent. The TAL is used to determine when possession limits are reduced to discourage targeting a species whose catches are approaching the ABC. For northern red hake, possession limits are reduced from 5,000 to 400 lbs. when landings reach 45% of the TAL[4]. For the other three stocks (southern red hake, southern whiting, and northern silver hake), possession limits are reduced to an incidental catch level (400 lbs. for red hake; 2,000 lbs. for silver hake/whiting) when landings reach 90% of the TAL.

Table 5. Proposed ABC and ACL specifications for 2015-2017 fishing years.

Stock	OFL (mt)	ABC (mt)	ACL (mt)	Change	Discard rate	TAL	Change
Northern silver hake	43,608	24,383	23,161	85.0%	11.2%	19,948.7	122.3%
Northern red hake	331	287	273	2.6%	60.6%	104.2	15.4%
Southern silver hake	60,148	31,180	29,621	-8.2%	17.1%	23,833.4	-12.6%
Southern red hake	3,400	3,179	3,021	-2.4%	55.3%	1,309.4	-2.0%

[2] The 50th percentile on scientific uncertainty is approximately the level that is associated with a 50%
[3] Since there was no ACL, fishing year 2011 catches were not estimated and monitored.
[4] The in-season AM for northern red hake was reduced in 2013 to 45% to account for an ABC overage in 2012.

Rationale: The proposed limits use best available science to prevent overfishing and are consistent with Magnuson-Stevens Act guidelines and requirements. The catch and survey data used to establish these limits were revised from 2008-2010 to 2011-2013 in an assessment update (NEFMC 2014). These estimates and their basis were reviewed by the Council's SSC and approved for the 2015-2017 fishing years.

Although scientific uncertainty was recalculated in the update assessment, the Council did not change the basis (otherwise known as 'P*') for selecting the level of precaution approved in Amendment 19. Due to the economic and ecological importance of silver hake stocks, plus uncertainty regarding the assessment model, the Council chose a P* equivalent to the 25th percentile on the distribution of scientific uncertainty estimates. This is estimated to have a very low probability that the fishing at the ABC would cause overfishing to occur. Red hake ABCs are set at a less-conservative 40th percentile on the distribution of scientific uncertainty due to lower economic value and the potential for this to become a choke stock for fisheries targeting other species (particularly silver hake). Estimates for the potential for overfishing at various P* levels are given in NEFMC 2014. These risk estimates are always less than 50% and are generally less than 10%

5.1.2 No Action

No action would retain the current specifications as shown below and the current accountability measures (including reducing the northern red hake possession limit to 400 lbs. when landings reach 45% of the TAL).

2013 Annual Whiting Specifications (May 1 - April 31)

Stock	Overfishing Limit (OFL)	Acceptable Biological Catch (ABC)	Annual Catch Limit (ACL) (95% of ABC)	Annual Catch Target (ACT)	Total Allowable Landings (TAL)	Optimal Yield (OY)
Northern Silver Hake (Whiting)	24,840 mt	13,777 mt	12,518 mt	NA	8,973 mt	Undefined
Southern Silver Hake	62,301 mt	33,940 mt	32,243 mt	NA	27,255 mt	Undefined
Northern Red Hake	314 mt	280 mt	266 mt	NA	90.3 mt	Undefined
Southern Red Hake	3,448 mt	3,259 mt	3,096 mt	NA	1,336 mt	Undefined

Rationale: This alternative would be chosen (or would continue in force according to existing regulations) if the agency decides that updates to the biological information on stock status and catches are not warranted.

5.2 Northern Red Hake Possession Limit and Accountability Measure Trigger

The following changes to existing management measures are being proposed to reduce the potential for northern red hake catches to exceed the ABC (as they did in fishing years 2012 and 2013) and potentially cause overfishing. None of the following alternatives change the post-season accountability measure described in §648.90. If an overage occurs, the AM trigger in the following fishing year would be reduced by the same percent that the catch had previously exceeded the ACL.

The action alternatives presented below include a correction to the northern red hake accountability measure (AM) trigger, currently set at 45% of the TAL. While preparing the assessment update to estimate the 2015-2017 specifications, and performing an evaluation of northern red hake overfishing risk, the Whiting PDT discovered an error in how the 2012-2014 specifications were set in Amendment 19. This error resulted in a 39 mt underestimate of the ABC for northern red hake and a 552 mt underestimate for southern red hake ABC. The ABCs for northern silver hake and southern whiting (combined southern silver hake and offshore hake) were unaffected. No correction is required for the southern red hake error, because the fishery caught a small fraction of the ABC and increases in the ABC would have had no effect. The AM for northern red hake was however triggered earlier than it should have been and also resulted in a larger overage in 2012 and 2013 than there would have been. As a result, the 400-lbs. in-season AM was set at 45% of the TAL in 2014, when in retrospect, the in-season AM should be invoked when the landings reach 62.5% of the TAL. Alternatives described in Sections 5.2.1or 5.2.2 are intended to correct for this northern red hake mis-specification.

During the 2012 and 2013 fishing years, catches of northern red hake exceeded the ABC and in 2012 also exceeded the overfishing limit (OFL). As a result, the post-season AM was implemented to reduce the 400-lbs. possession limit trigger from 90% of the TAL to 45% of the TAL, accounting for a 45% overage in 2012. This measure became effective in the 2014 fishing year, so its effectiveness to prevent the fishery from exceeding the annual catch limit (ACL) has not yet been fully evaluated.

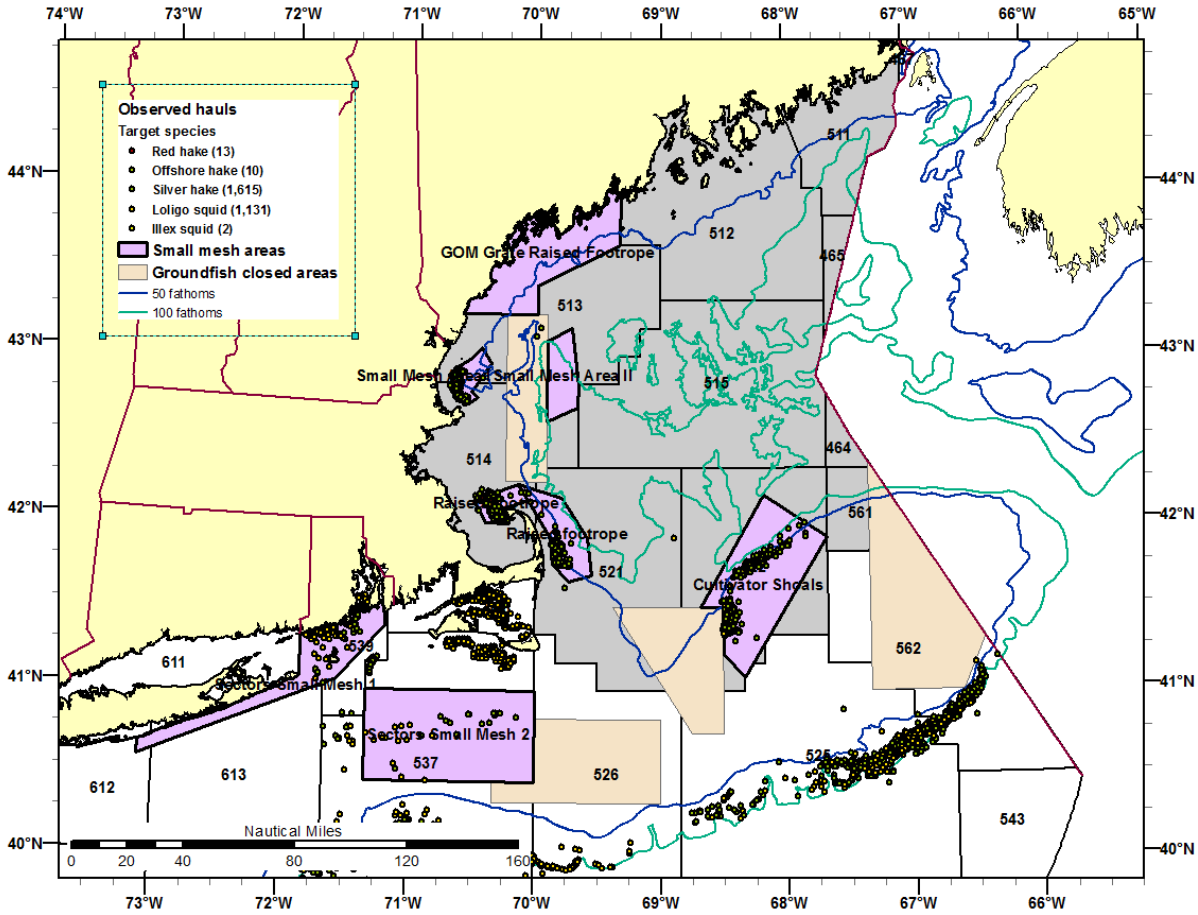
Nonetheless, the Council is concerned that further adjustments to the northern red hake possession limit may be necessary to prevent future overfishing, despite the proposed increase in the northern red hake specifications. The Whiting PDT performed a sensitivity analysis to assess the risk of overfishing, which showed that the risk of overfishing is either very low (<1%) or very high (>99%) depending on how much the catch increases in response to increasing northern red hake biomass.

5.2.1 3000 lbs. Possession Limit / 1500 lbs. Possession Limit; Correction to Accountability Measure Trigger (preferred)

The red hake possession limit for vessels fishing (with any gear) in the northern management area (statistical areas 464-465, 511-522, and 561; Map 2) would begin the fishing year on May 1 at 3,000 lbs. As they are now, landings would be monitored and the northern red hake possession limit would decline to 1,500 lbs. when landings reach 45% of the TAL. The trigger to the in-season AM for northern red hake would be corrected to account for a 39 mt underestimate of the 2012-2014 ABC, so that the northern red hake possession limit would decline to the-400 lbs. incidental possession limit when landings reach 62.5% of the TAL and remain at that level until the end of the fishing year, April 30.

Future accountability measures, to be applied in the following fishing year when catch exceeds the ACL, would be deducted from the corrected 62.5% trigger, following the procedure described in §648.90. If a future overage is more than 17.5% (62.5 – 45%), the possession limit would begin the fishing year at 3,000 lbs. and would decline to the 400 lbs. incidental limit when the AM trigger is met.

Map 2. Map of statistical catch areas associated with the northern small-mesh management area for red hake, with locations of observed hauls since 2002 by target species and small-mesh exemption area boundaries.



Rationale:

This alternative is intended to reduce the potential for continued overfishing by lowering the possession limit from 5,000 lbs. at the start of the fishing season to only 3,000 lbs., and then to 1,500 lbs. when landings reach 45% of the TAL. Lowering the possession limit to these values is expected to discourage fishermen from targeting red hake and to encourage them to fish in areas, seasons or ways that avoid catching excess red hake.

Industry advisors think that this measure will discourage trips that target or partially target northern red hake. They also say that vessels catching a mix of red and silver hake will be more likely to fish in areas and at times when red hake are less abundant while they target silver hake. Red hake tend to inhabit muddier bottom and somewhat different temperatures than silver hake, making this effect possible. Section 7.1.2.1 analyzes the potential to reduce landings and catch by changing the northern red hake possession limit. Compared to starting the fishing year with a 5,000 lbs. possession limit, it is more likely that the in-season AM would be delayed, possibly increasing revenue for trips taken later in the year to target silver hake, and reducing discarding.

This alternative would also correct the northern red hake accountability measure to account for an underestimate of the 2012-2014 ABC. Due to this 39 mt underestimate (see September 25, 2014 memo from the Whiting PDT to the Whiting Oversight Committee), fishing year 2012 catches were only 27.5% over the ACL instead of 45%. Thus, the in-season AM would take effect (lowering the northern red hake possession limit to 400 lbs., an incidental limit that discourages targeting the stock) when landings reach 62.5% of the TAL, instead of 45% of the TAL.

5.2.2 Correction to Accountability Measure Trigger

This alternative would increase the AM trigger for the northern red hake stock from 45% of the TAL to 62.5% of the TAL. The AM trigger causes NMFS to reduce the 5,000 lbs. possession limit to 400 lbs. when landings reach the trigger point. Future accountability measures, to be applied in the following fishing year when catch exceeds the ACL, would be deducted from the corrected 62.5% trigger, following the procedure described in §648.90. No change to the initial northern red hake possession limit is being proposed by this alternative.

Rationale:

This measure would make a correction for the underestimated 2012-2014 northern red hake ABC, applying best available science. According to the NEFSC, new information indicates that the original 280 mt ABC estimate should have been 319 mt after the final audited data had been released, but this error was not recognized until the Whiting PDT had begun preparing this specifications document. The additional 39 mt would reduce the 2012 overage to 27.5% and the in-season AM should therefore be triggered when landings reach 62.5% of the TAL (the original 90% less the 27.5% overage), instead of 45% of the TAL that was applied beginning in fishing year 2014.

Keeping the northern red hake possession limit at 5,000 lbs. at the beginning of the fishing year would allow vessels to target and retain northern red hake. Although fishermen may gain revenue from landing more northern red hake on trips early in the fishing year, later trips would be limited to 400 lbs. once the in-season AM is triggered. Compared to no action, this alternative would delay when the in-season AM would become effective and therefore reduce northern red hake discards. Potentially, it would also increase revenue for vessels that target northern red hake early in the fishing year or for those trips that retain more than 400 lbs. of red hake while targeting other species.

5.2.3 No Action

This alternative would make no changes to the in-season AM trigger or the northern red hake possession limit. Starting the fishing year with a 5,000 lbs. northern red hake possession limit, the in-season AM would be triggered when landings reach 45% of the TAL and a 400 lbs. possession limit would remain in place until the end of the fishing year, April 30.

Rationale:

Although new data indicate that the 2012-2014 ABC should have been 39 mt higher than set by Amendment 19, this measure would keep the current in-season AM trigger of 45%. Overages in 2013 were less than they were in 2012, so no further adjustments of the in-season AM trigger were required. No action would be taken if NMFS finds that there is no basis for correcting the northern red hake AM to account for a revised estimate of the 2012-2014 ABC.

Although potentially causing more discards than the other alternatives, this alternative has the lowest probability that northern red hake overfishing would continue, because any fishing effort targeting northern red hake would be curtailed earlier in the fishing year. Conversely, revenue from trips targeting northern red hake and landing the stock as incidental catch in other fisheries would be reduced.

6.0 AFFECTED ENVIRONMENT

6.1 Red Hake Stocks

The results of the most recent red hake stock assessment can be found in the SAFE Report for Fishing Year 2013 (NEFMC 2014; http://s3.amazonaws.com/nefmc.org/SAFE-Report-for-Fishing-Year-2013.pdf). The most recent red hake assessment update indicates that both stocks are not overfished, although overfishing is occurring in the northern stock and overfishing is not occurring in the southern stock. The recent three year arithmetic mean biomass index based on the NEFSC spring bottom trawl survey for the northern and southern stocks were both above the proposed management threshold. The recent three year average exploitation index was just above the management threshold in the north and below the management threshold in the south.

Red hake landings in the north have generally increased in recent years, although discards have also greatly increased at a higher rate. Since the implementation of the current annual catch limits in 2012, the northern red hake stock is the only one to have exceeded its ACL. Northern red hake landings increased slightly from 104 mt in 2012 to 115 mt in 2013, while discards increased and catch decreased from 386 mt to 361 mt. The 2012- 2013 discard estimates for northern red hake have increased compared to the 2008-2010 estimates, increasing from 65 to 70 percent. Spring survey biomass of northern red hake has been decreasing in recent years (since reaching a peak in 2008) but the most recent spring survey indicates a significant increase in northern red hake biomass. The relatively strong incoming year class observed in 2014 and the assumption that current environmental and fishing conditions will prevail, there is potential for population growth in the subsequent years. The fall survey biomass and exploitation ratios for northern red hake are displayed in Figure 1.

In the south, red hake catches remained relatively stable (aside from a slight decrease from 2012-2013) and although discards in the fishery are still high, the 2012-2013 estimates have decreased from the 2008-2010 estimates (from 56 percent down to 49 percent). Southern red hake landings have also decreased from 581 mt in 2012 to 490 mt in 2013. The decline in the population biomass is accompanied by a slight increase in the relative exploitation index but without a change in fishery and population status relative to the reference thresholds. Although the biomass threshold is above the target and threshold, the population biomass will likely continue to decline if recruitment remains poor at current catch levels. The fall survey biomass and exploitation ratios for southern red hake are displayed in Figure 2.

Figure 1. *Northern Red hake* spring survey biomass in kg/tow (LEFT) and relative exploitation ratios (RIGHT) of the total catch to the spring survey indices in kt/kg and associated 3-yr moving averages (red lines). The horizontal dash lines represent the biomass and overfishing thresholds and the solid line is the biomass target. The BOTTOM panels reflect the most recent 20 years of the entire time series.

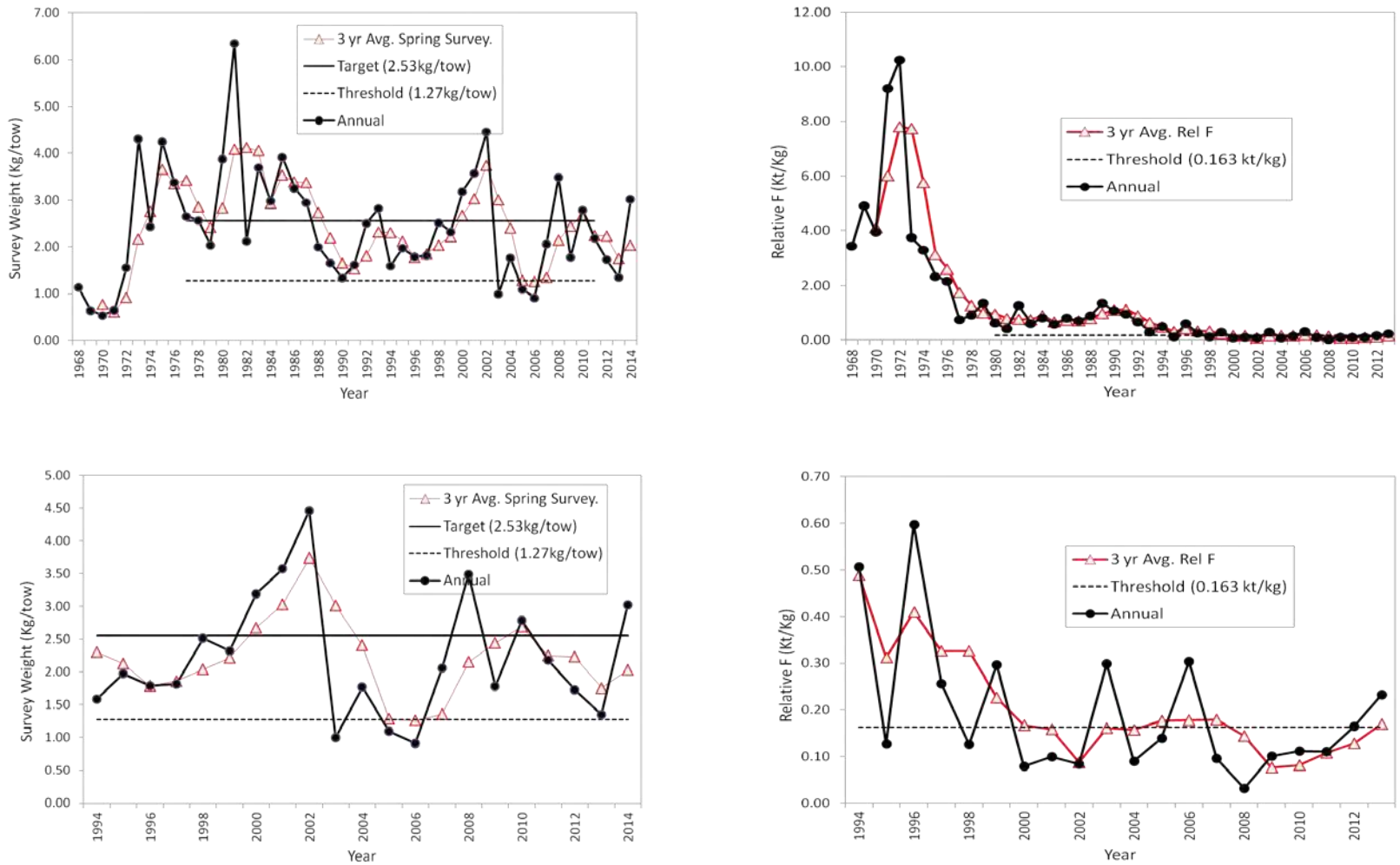
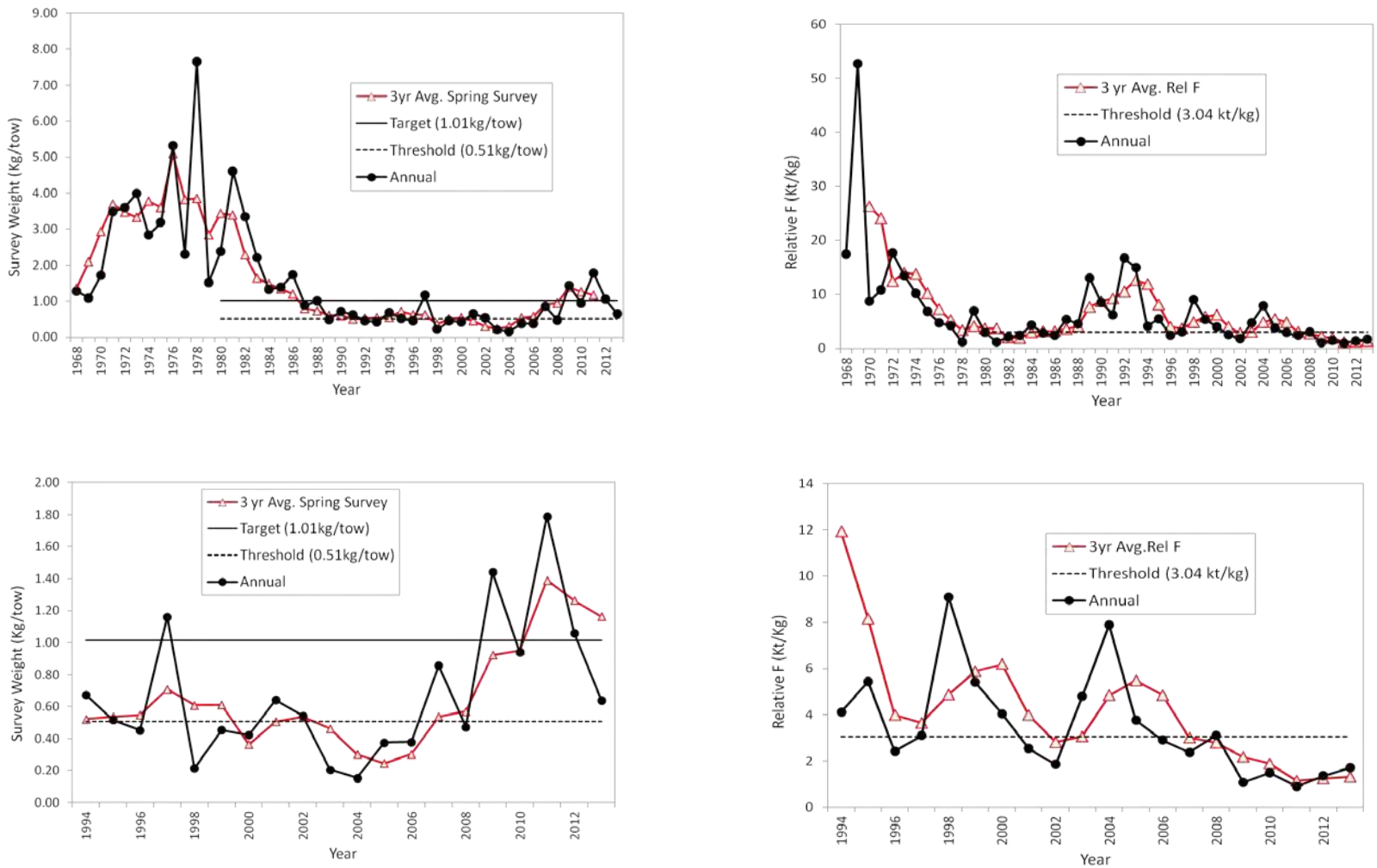


Figure 2. *Southern red hake* spring survey biomass in kg/tow (LEFT) and relative exploitation ratios (RIGHT) of the total catch to the spring survey indices in kt/kg and associated 3-yr moving averages (red lines). The horizontal dash lines represent the biomass and overfishing thresholds and the solid line is the biomass target. The BOTTOM panels reflect the most recent 20 years of the entire time series



6.2 Silver and Offshore Hake Stocks

The results of the most recent silver and offshore hake stock assessment can be found in the SAFE Report for Fishing Year 2013 (http://s3.amazonaws.com/nefmc.org/SAFE-Report-for-Fishing-Year-2013.pdf). Results of the assessment update show that both stocks of silver hake are not overfished and overfishing is not occurring. The three year average fall biomass index in the north and south are both above the overfished management threshold. The exploitation index measured as the ratio of catch to survey has remained consistently low since the previous benchmark assessment and well below the management overfishing definition thresholds. The survey biomass and exploitation ratios for northern and southern silver hake are displayed in Figure 3 and Figure 4, respectively.

Northern silver hake catch decreased from 2,199 mt in 2012 to 1,734 mt in 2013 and landings also decreased from 1,906 mt to 1,434 mt. Despite this, catches of northern silver hake have generally increased in recent years (since 2009) and discards have generally decreased. The fall survey biomass of northern silver hake has significantly increased since 2008 and is accompanied by a decrease in the relative exploitation index. Southern silver hake landings have decreased since 2009, with a recent decrease from 5,430 mt in 2012 to 4,790 mt in 2013. Total catch of southern silver hake has also decreased since 2009, specifically from 6,450 mt in 2012 to 5,420 mt in 2013. Stock status for both the northern and southern stocks of silver hake continues to improve with increasing trends in population biomass and relatively stable catches in recent years. The proposed OFL estimates suggest that both stocks can withstand higher level of catch with little to no risk of exceeding the overfishing limit.

Southern whiting[5] landings increased from 5,041 mt in 2012 to 5,110 mt in 2013 while catch decreased from 6,496 mt to 5,746 mt. Compared to the 2008-2010 discard estimates, the 2012-2013 average southern whiting discards did not change, remaining at 13%.

[5] "Whiting landings" refers to the total landings of both silver and offshore hake.

Figure 3. *Northern Silver hake* fall survey biomass in kg/tow (LEFT) and relative exploitation ratios (RIGHT) of the total catch to the fall survey indices in kt/kg and associated 3-yr moving averages (red lines). The horizontal dash lines represent the biomass and overfishing thresholds and the solid line is the biomass target. The BOTTOM panels reflect the most recent 20 years of the entire time series.

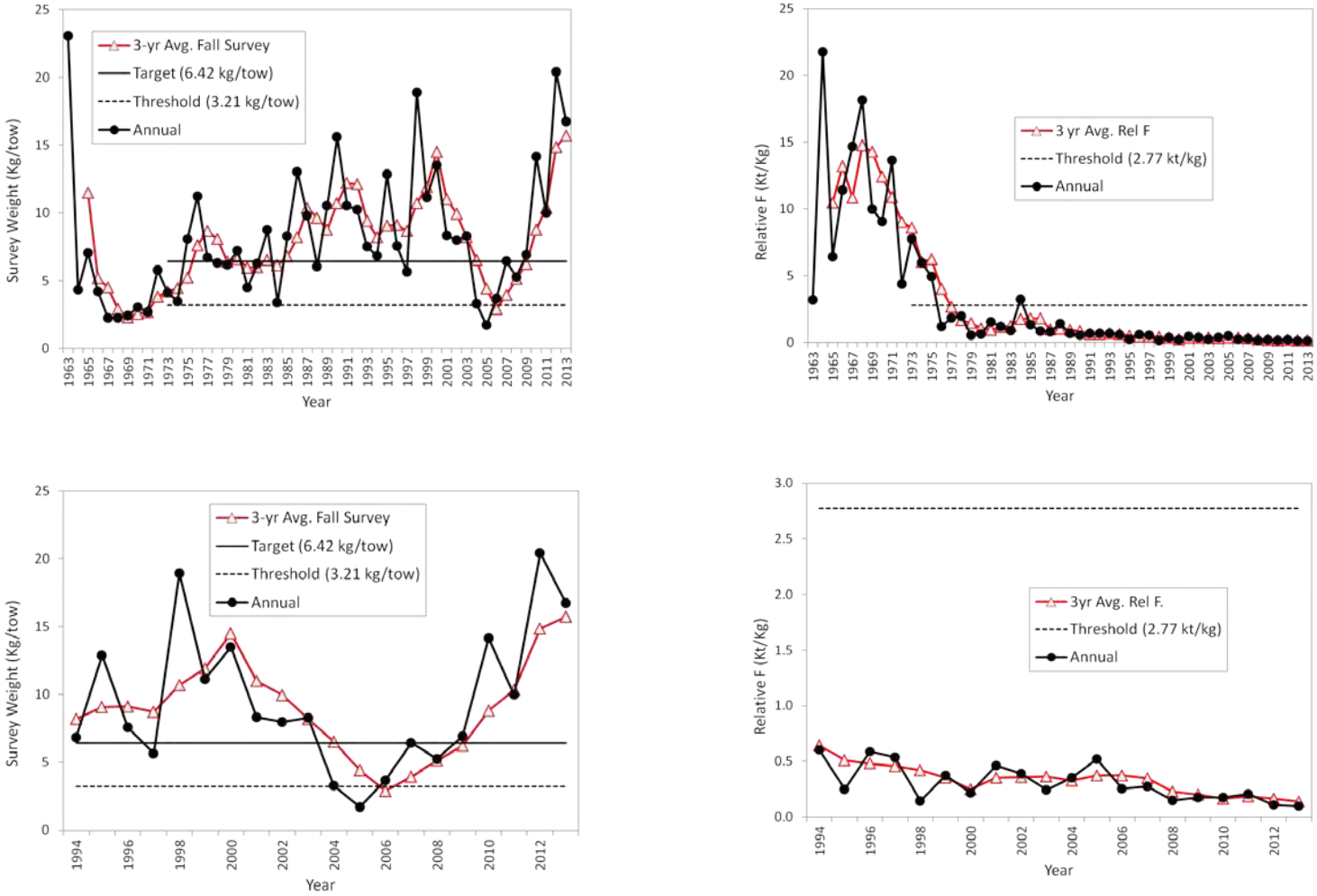
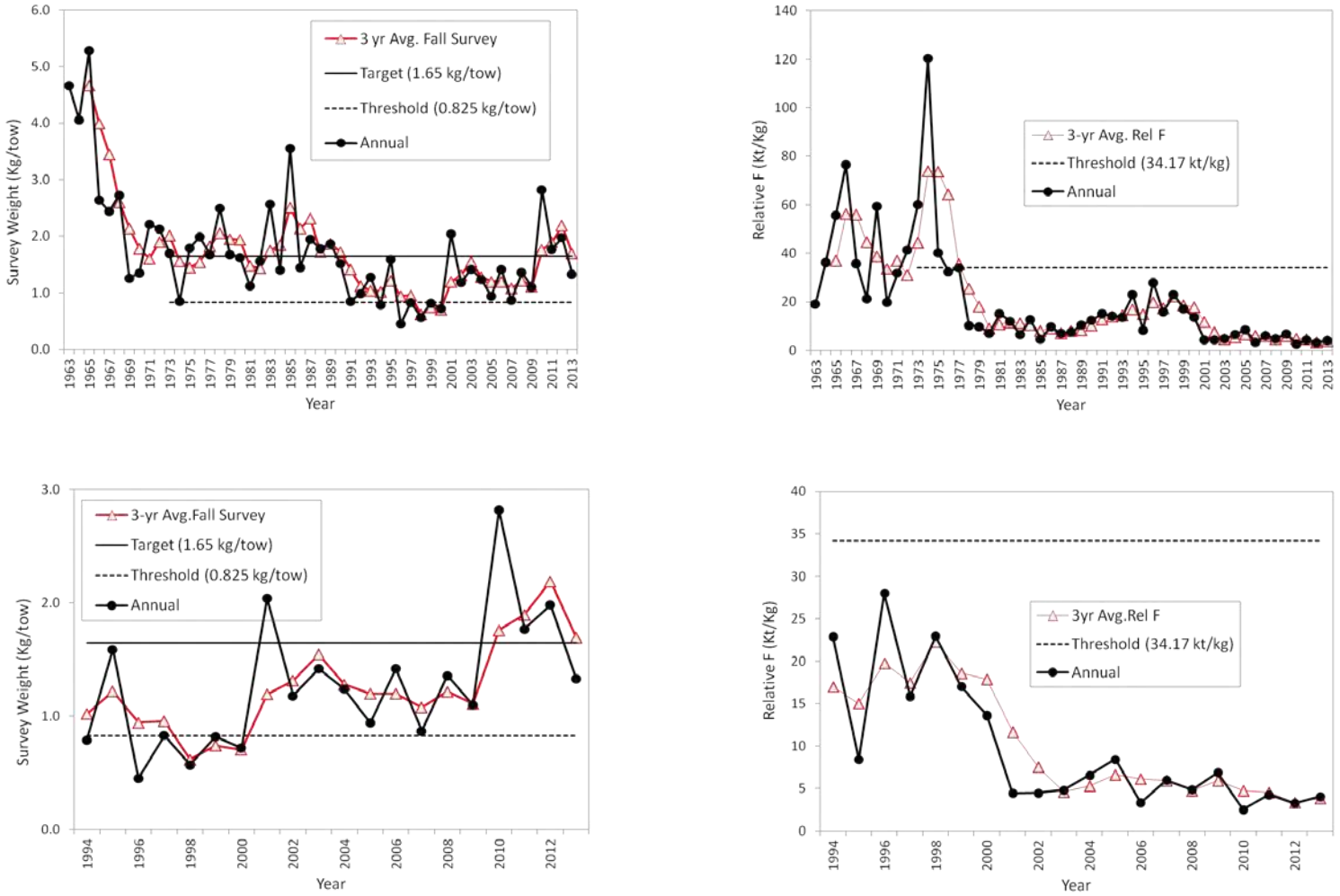


Figure 4. *Southern silver hake* fall survey biomass in kg/tow (LEFT) and relative exploitation ratios (RIGHT) of the total catch to the fall survey indices in kt/kg and associated 3-yr moving averages (red lines). The horizontal dash lines represent the biomass and overfishing thresholds and the solid line is the biomass target. The BOTTOM panels reflect the most recent 20 years of the entire time series



6.3 Non-Target Species and Bycatch

Additional information on the effect of the small-mesh fishery on non-target species and bycatch can be found in Amendment 19 to the Small-mesh Multispecies FMP (http://s3.amazonaws.com/nefmc.org/Final_Amendment_19.pdf). The non-target species that are likely affected by the small-mesh multispecies are (as listed in Amendment 19): The northeast skate complex, spiny dogfish, summer flounder, windowpane flounder, yellowtail flounder, American plaice, witch flounder, scup, black sea bass, monkfish, Atlantic cod, haddock, red crab, Atlantic sea scallop, longfin squid, *Illex* squid, butterfish, mackerel and redfish. Species are managed with ACLs implemented in New England and Mid-Atlantic fishery management plans. In addition, overfishing for these species is prevented by existing catch limits and accountability measures. Selective gear is also required in the small-mesh exemption areas in order to minimize impacts on these other species.

The proportion of discards to total catch on trips that were likely to target red or silver hake was fairly similar between the two stock areas. In the northern stock area, from 2004-2010, 38% of observed catches were discarded on trips that were likely to target silver hake, while 40% of total catch were discarded on trips that were likely directed towards red hake. During that same time period, discards of all species caught in the trips that likely targeted silver or red hake in the southern area represented 32% and 36% of the observed catch for these fisheries, respectively. The majority of discards consisted of the small-mesh groundfish species complex (silver, offshore and red hake).

The other frequently discarded species on trips that caught small-mesh multispecies (i.e., trips with trawl mesh size greater than 2.5 inches or less than 4.5 inches, in addition to other gear types) included dogfish in the northern stock area, squids, mackerel, and butterfish in the southern stock area, and skates in both the northern and southern stock area.

6.4 Physical Environment and Essential Fish Habitat

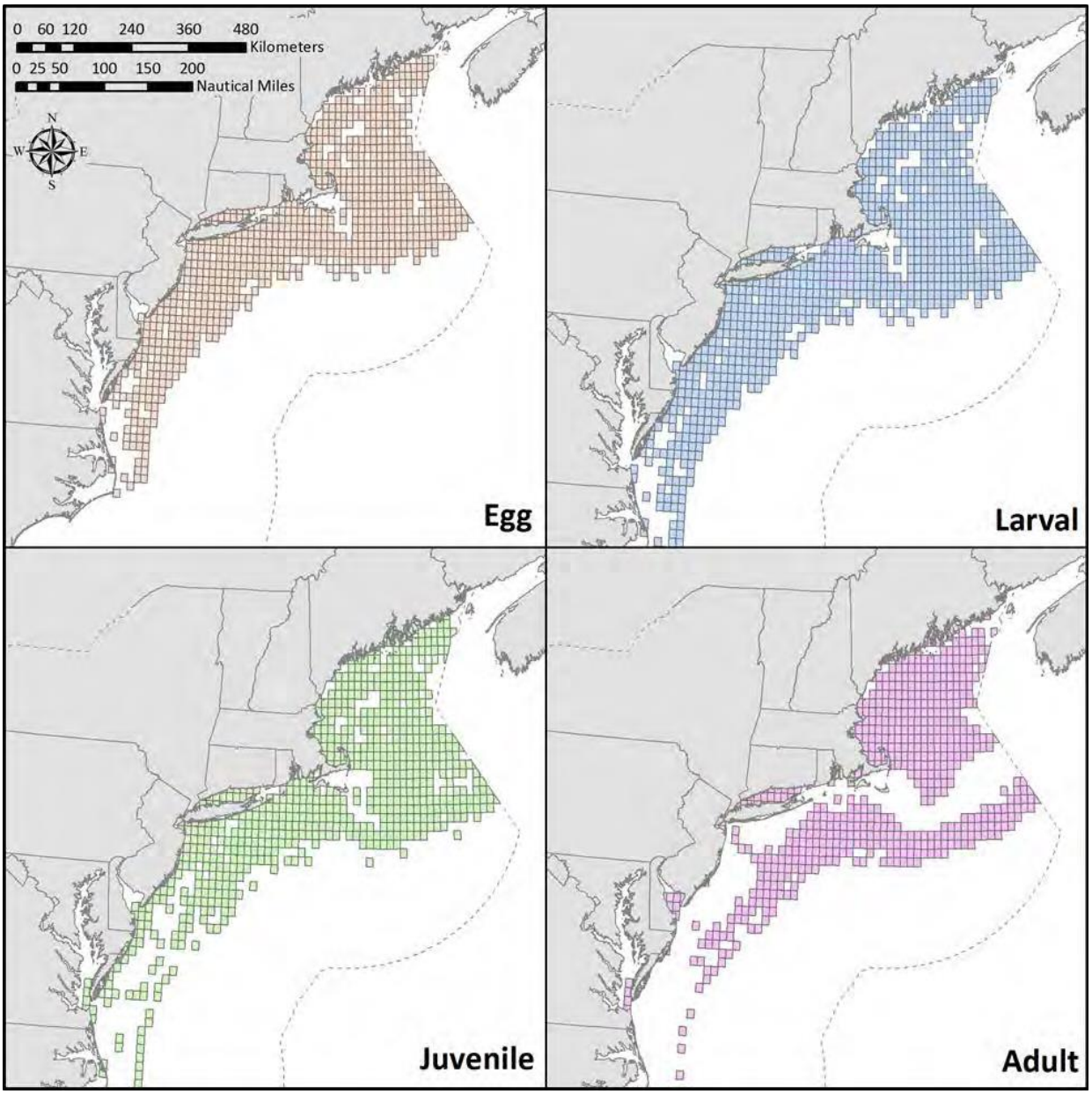
Section 4.13 of the Amendment 12 (NEFMC 2000) describes and identifies EFH for red, silver, and offshore hakes, based on the observed distribution of eggs, juvenile, and adult fish. The section includes maps based on the distribution of juveniles and adults. In general, no information was available on the distribution of eggs. These data are being updated by the Omnibus Habitat amendment, found at: http://www.nefmc.org/library/omnibus-habitat-amendment-2. This specifications document proposes no changes to small-mesh multispecies EFH descriptions or designations.

Red hake EFH designations are shown in Map 3. Red hake eggs and larvae are found in surface waters in the same areas as silver hake eggs and larvae. Generally, red hake eggs are found where sea surface temperatures are less than 10°C with salinity less than 25%. Red hake eggs are observed most frequently from May to November, with peaks in June and July. Larvae are generally found where sea surface temperatures are below 19°C at water depths less than 200 meters. They are observed most frequently from May through December, peaking in September and October. Red hake juveniles are found in bottom habitats with shell fragment substrates (often in the same areas as abundances of scallops) in the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the Mid-Atlantic south to Cape Hatteras. Juveniles are generally found where temperatures are below 16°C, at depths less than 100 meters. Red hake adults are found in the same regions as juveniles, but in bottom habitats in depressions of sand and mud substrates. They are generally found where temperatures are below 12°C at depths from 10-130 meters. Spawning red hake adults are found in bottom habitats in depressions with a sand and mud substrate in the Gulf of Maine, the southern edge of Georges Bank, the continental shelf off New England and from the Mid-Atlantic south to Cape Hatteras. They are generally found where water temperatures are blow 10°C at depths less than 100 meters. Red hake spawning is observed most often from May- November, peaking in June and July.

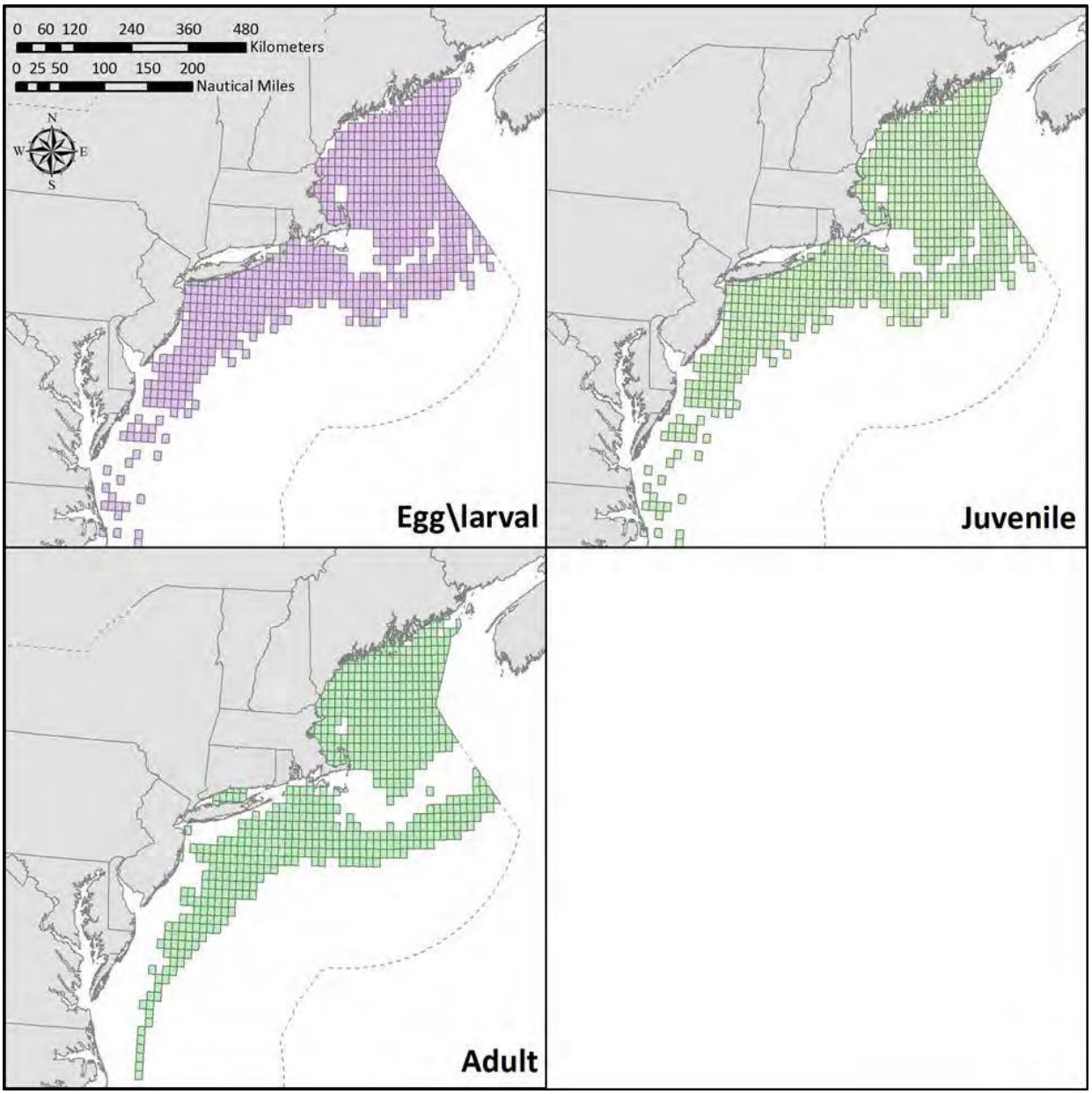
Silver hake EFH designations are shown in Map 4. Silver hake eggs and larvae are found in surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the Mid-Atlantic south to Cape Hatteras. They are found at water depths between 50 and 150 meters, where the temperature is below 21°C. Silver hake eggs and larvae are observed all year, with egg observations peaking from July through October and larvae observations peaking from July through September. Silver hake egg observations peak from June through October, and larvae observations peak from July through September. Juvenile, adult and spawning adult silver hake typically inhabit bottom habitats of all substrate types in the same regions where the eggs and larvae are located. Juveniles are found at depths between 20 and 270 meters where water temperatures are below 21°C. Adults are found at depths between 30 and 325 meters where water temperatures are below 22°C. Spawning adults are found at depths between 30 and 325 meters where water temperatures are below 13°C.

Offshore hake EFH designations are shown in Map 5. Offshore hake eggs and larvae are found in pelagic waters along the outer continental shelf of Georges Bank and southern New England south to the Chesapeake Bay, with eggs being found as far south as Cape Hatteras. They are generally found where the water temperature is below 20°C at depths less than 1250 meters. Eggs are primarily collected at depths between 110 and 270 meters, and larvae at depths between 70-130 meters. Eggs and larvae are observed all year. Offshore hake juveniles and adults are found in bottom habitats along the outer continental shelf of Georges Bank and southern New England south to Cape Hatteras. Both juveniles and adults are generally found where water temperatures are below 12°C, while juveniles are mostly found at depths from 170-350 meters and adults are mostly found at depths from 150-380 meters. Spawning offshore hake adults are found in bottom habitats along the outer continental shelf of Georges Bank and southern New England south to the Mid-Atlantic Bight. They are generally observed where water temperatures are below 12°C at depths from 330-550 meters and spawn throughout the year.

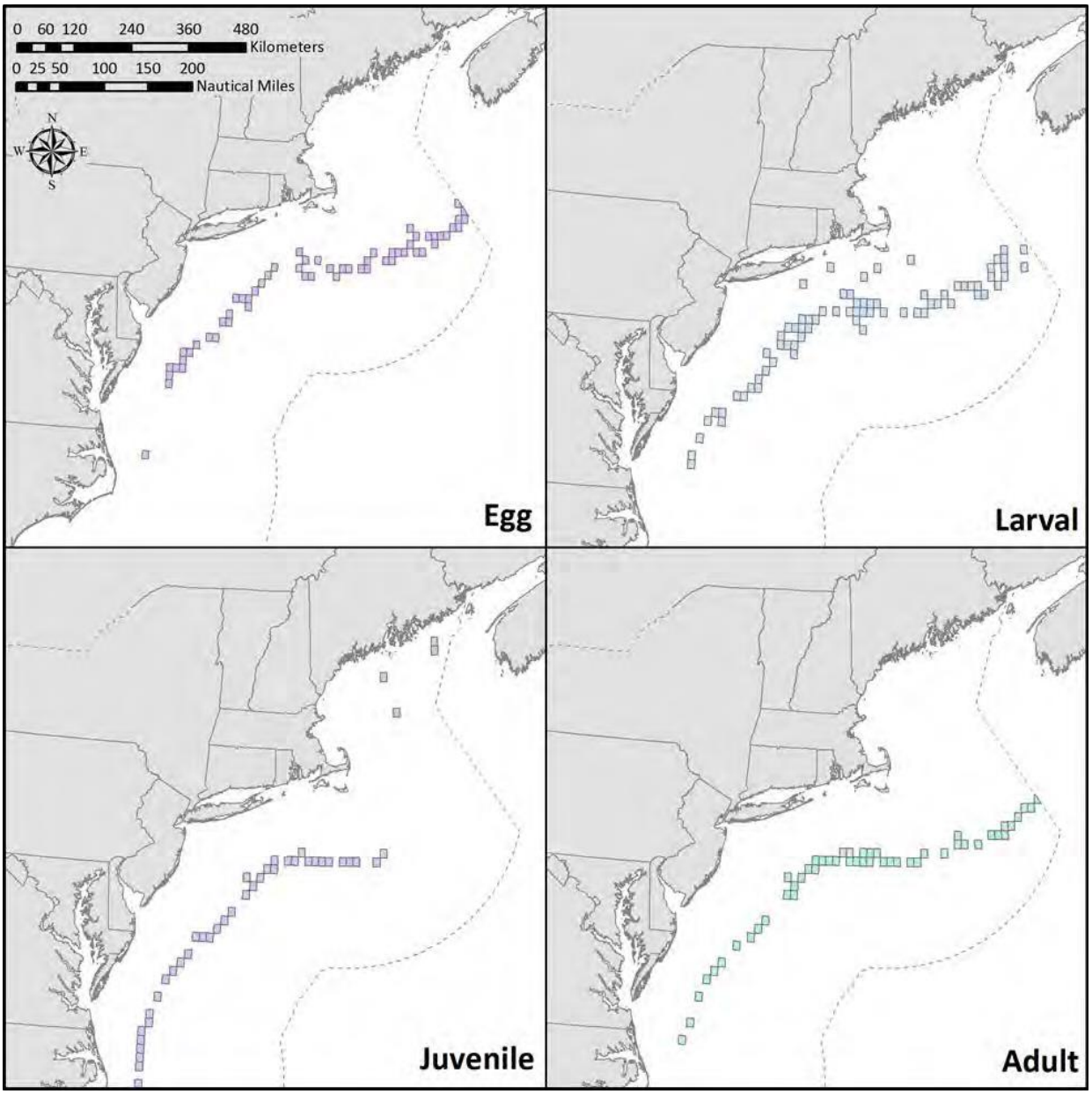
Map 3. EFH designations for red hake



Map 4. EFH designations for silver hake.



Map 5. EFH designations for offshore hake.



6.5 Protected Resources

As described in the executive summary, the small-mesh multispecies is a component of the Northeast Multispecies FMP. As protected resources in the affected environment of the Northeast Multispecies FMP have recently been described in Framework 53, the following sections will only focus on those species likely to be present in the affected environment of the small-mesh component of this fishery. In addition, information on protected species interaction with fishery gear will be focused upon the potential to interact with gear specifically used in the small-mesh component of the Northeast Multispecies FMP (i.e., bottom trawls). For additional information on protected species interactions with gear types used in the larger Northeast Multispecies FMP overall (e.g., gillnet and bottom trawls), please see the affected environment section in Framework 53.

6.5.1 Species Present in the Area

Numerous protected species inhabit the environment within the small-mesh component of Northeast Multispecies FMP (Table 1). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA).

Table 6. Species Protected Under the Endangered Species Act and/or Marine Mammal Protection Act that May Occur in the Operation Area for the Small-Mesh Component of the Northeast Multispecies Fishery

Species	Status	Potentially affected by this action?
Cetaceans		
North Atlantic right whale (*Eubalaena glacialis*)	Endangered	No
Humpback whale (*Megaptera novaeangliae*)	Endangered	No
Fin whale (*Balaenoptera physalus*)	Endangered	No
Sei whale (*Balaenoptera borealis*)	Endangered	No
Blue whale (*Balaenoptera musculus*)	Endangered	No
Sperm whale (*Physeter macrocephalus*	Endangered	No
Minke whale (*Balaenoptera acutorostrata*)	Protected	No
Pilot whale (*Globicephala spp.*)[1]	Protected	Yes
Risso's dolphin (*Grampus griseus*)	Protected	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected	Yes
Short Beaked Common dolphin (*Delphinus delphis*)[2]	Protected	Yes
Spotted dolphin (*Stenella frontalis*)	Protected	No
Bottlenose dolphin (*Tursiops truncatus*)[3]	Protected	Yes
Harbor porpoise (*Phocoena phocoena*)	Protected	Yes
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle (*Chelonia mydas*)	Endangered[4]	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes

Cusk *(Brosme brosme)*	Candidate	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected	Yes
Gray seal (*Halichoerus grypus*)	Protected	Yes
Harp seal (*Phoca groenlandicus*)	Protected	Yes
Hooded seal (*Cystophora cristata*)	Protected	Yes

Notes:

[1] There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.

[2] Prior to 2008, this species was called "common dolphin."

[3] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.

[4] Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

Cusk, a NMFS "species of concern," as well as a "candidate species" under the ESA (Table 1), occurs in the affected environment of the small-mesh component of the multispecies fishery. Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA and also include those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. Candidate species also receive no substantive or procedural protection under the ESA; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. NMFS has initiated review of recent stock assessments, bycatch information, and other information for these candidate/proposed species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information reviews. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10).

In regards to cusk, NMFS initiated a status review due to concerns over the status of and threats to cusk, particularly bycatch. NMFS is involved in various proactive conservation initiatives to obtain more information on this data poor species to assess its status and further conservation efforts. These initiatives involve cooperative efforts with industry, scientists, and other partners to learn more about cusk. NMFS is especially interested in the investigation and identification of methods to reduce bycatch or discard mortality of cusk, and, in particular, studies of how to alleviate barotrauma effects in released cusk are of high interest. In the Northeastern U.S., cusk are predominantly caught in the Gulf of Maine in commercial bottom trawl, bottom longline, gillnet, lobster trap, and handline/rod and reel gears, as well recreational handline gear (O'Brien, 2010; GMRI, 2012). Additional information on cusk and some conservation efforts can be found atwww.nero.noaa.gov/prot_res/CandidateSpeciesProgram/CuskSOC.html; please note, however, as

cusk receive no substantive or procedural protection under the ESA (due to its candidate species status), this species will not be discussed further in this document.

6.5.2 Species Potentially Affected by the Proposed Action

The small-mesh component of the multispecies fishery may affect multiple protected species of cetacean, sea turtles, pinnipeds, and fish (Table 1). Of primary concern is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species. To understand the potential risk of an interaction, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) records of protected species interaction with particular fishing gear types.
Information on species occurrence in the affected environment of the small-mesh component of the multispecies fishery is presented in Section 6.5.2, while information on protected species interactions with fishery gear is presented in Section 6.5.3.

6.5.2.1 Sea turtles

Status and Trends

Four ESA listed species of sea turtles occur in the affected environment of the small-mesh component of the multispecies fisheries (Table 2). Three of the four species are considered hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status of the other four species, as well as a description and life history of the species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant *et al.* 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS *et al.* 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

Table 7. Sea turtle species found in the affected environment of the small-mesh component of the multispecies fishery

Species	Listed At	Status	Trends
Green	Species Level	Endangered: Breeding populations in Florida and on the Pacific coast of Mexico Threatened: Other populations	Based on nesting data for four nesting sites, green sea turtle abundance is increasing.[1]
Kemp's ridley	Species Level	Endangered	Total annual number of nest at Rancho Nuevo, Tamaulipas, Mexico, the primary stretch of nesting beach, showed gradual increases in 1990s. Since 2009, nesting has not shown a notable increase.[2]
Loggerhead	Distinct Population Segment (DPS)	Northwest Atlantic DPS: Threatened	• Nesting data from 2008-2012 shows a positive nesting trend since 2007.[3] • In-water studies show an increasing trend in abundance from 3 of the 4 in-water sites in the southeast U.S.(the other site showed no discernable trend, and a decreasing trend at 2 sites in the Mid-Atlantic.[4]
Leatherback	Species Level	Endangered	Nesting counts in many areas show an increasing trend, while the largest nesting area (Suriname and French Guiana) show a stable trend.[5]

Sources:
[1] Seminoff 2004; NMFS and USFWS 2007d.
[2] NMFS and USFWSc; NMFS *et al*. 2011;Pena *et al*. 2012.
[3] http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trends/; NMFS and USFWS 2008; Witherington *et al*. 2009; and TEWG 2009.
[4] TEWG 2009; NMFS and USFWS 2008.
[5] NMFS and USFWS 2013

Occurrence and Distribution

The small-mesh component of the multispecies fishery occurs in waters north of 35°N, where sea turtles occur seasonally. A general overview of sea turtle occurrence and distribution in the continental shelf waters of the Northwest Atlantic Ocean is provided below to assist in understanding how the small-mesh component of the multispecies fisheries overlaps in time and space with the occurrence of sea turtles.

Hard-shelled sea turtles

Distribution

In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf

from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Shoop and Kenney 1992; Epperly *et al.* 1995a, 1995b; Braun and Epperly 1996; Mitchell *et*

al. 2003; Braun-McNeill *et al.* 2008; TEWG 2009). While hard-shelled turtles are most common south of Cape Cod, MA, loggerhead sea turtles are known to occur in the Gulf of Maine (GOM), feeding as far north as southern Canada. Loggerheads have been observed in waters with surface temperatures of 7°C to 30°C, but water temperatures ≥11°C are most favorable (Shoop and Kenney 1992; Epperly *et al.* 1995b). Sea turtle presence in U.S. Atlantic waters is also influenced by water depth. While hard-shelled turtles occur in waters from the beach to beyond the continental shelf, they are most commonly found in neritic waters of the inner continental shelf (Mitchell *et al.* 2003; Braun-McNeill and Epperly 2004; Morreale and Standora 2005; Blumenthal *et al.* 2006; Hawkes *et al.* 2006; McClellan and Read 2007; Mansfield *et al.* 2009; Hawkes *et al.* 2011; Griffin *et al.* 2013).

Seasonality

Hard-shelled sea turtles occur year-round in waters south of Cape Hatteras, North Carolina. As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Epperly *et al.* 1995a, 1995b, 1995c; Braun-McNeill and Epperly 2004; Morreale and Standora 2005; Griffin *et al.* 2013), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop and Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall. By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further (Shoop and Kenney 1992; Epperly *et al.* 1995b; Hawkes *et al.* 2011; Griffin *et al.* 2013).

Leatherback sea turtles

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

6.5.2.2 Small cetacean

Status and Trends

Small cetaceans that occur in the affected environment of the small-mesh component of the multispecies fisheries are listed in the table below. For additional information on the biology, status, and range wide distribution of each small cetacean species please refer to Waring *et al*. 2014.

Table 8. Small cetacean species that occur in the affected environment of the small-mesh component of the multispecies fishery

Species	Listed Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock
Atlantic White Sided Dolphin	No	Yes	30,403	unknown	No
Short-Finned Pilot Whale	No	Yes	15,913	unknown	No
Long-Finned Pilot Whale	No	Yes	19,930	unknown	No
Rissos Dolphin	No	Yes	12,619	unknown	No
Short Beaked Common Dolphin	No	Yes	112,531	unknown	No
Harbor Porpoise	**No**	**Yes**	**61,415**	**unknown**	**Yes[1]**
Bottlenose Dolphin (*Western North Atlantic Offshore Stock*)	No	Yes	56,053	unknown	No
Bottlenose Dolphin (*Western North Atlantic Northern Migratory Coastal Stock*)	**No**	**Yes**	**8,620**	**unknown**	**Yes[2]**
Bottlenose Dolphin (*Western North Atlantic Southern Migratory Coastal Stock*)	**No**	**Yes**	**6,326**	**unknown**	**Yes[3]**

Notes: [1] Harbor porpoise are considered a strategic stock under the MMPA as the level of direct human-caused mortality has exceeded the PBR level for this species.

[2,3] Both northern and southern migratory coastal stocks of bottlenose dolphins are considered a strategic stock under the MMPA as both stocks are designated as depleted under the Act.

Source: Waring *et al*. 2014

Occurrence and Distribution

Small cetaceans are found throughout the waters of the Northwest Atlantic Ocean. In the affected area, they can be found throughout the year from Cape Hatteras, North Carolina (35°N), to the Canadian border (Waring *et al*. 2014). Within this range; however, there are seasonal shifts in species distribution and abundance. As the affected area of the multi-species fishery occurs in waters north of 35°N, and small cetaceans may be present in these waters throughout the year, the small-mesh component of the multispecies fisheries and small cetaceans are likely to co-occur in the affected area. To further assist in

understanding how the small-mesh component of the multispecies fisheries overlaps in time and space with the occurrence of small cetaceans, a general overview of species occurrence and distribution in the continental shelf waters of the affected environment of the small-mesh component of the multispecies fishery is provided in the following table. For additional information on the biology, status, and range wide distribution of each species please refer to Waring *et al*. 2014,

Table 9. Small cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries[1]

Species	Prevalence and Approximate Months of Occurrence (if known)
Atlantic White Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 meter isobath) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions; however, most common in the SNE, GB, and GOM sub-regions (i.e., shelf waters from Hudson Canyon (~ 39°N) and into GB, Massachusetts Bay, and the GOM). • Seasonal shifts in distribution: ***January-May**: low densities found from GB to Jeffreys Ledge; ***June-September**: Large densities found from GB, through the GOM; ***October-December**: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic sub- regions), low densities found year round, with waters off Virginia and North Carolina representing southern extent of species range during winter months.
Short Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 meter isobaths) of the Mid-Atlanitc, SNE, and GB sub-regions (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Occasionally found in the GOM. • Seasonal shift in distribution: ***January-May**: occur from Cape Hatteras, NC, to GB ***Mid-summer-autumn**: moves onto GB; *Peak abundance* found on GB in the autumn.
Risso's Dolphin	• Common in the continental shelf edge waters of the Mid-Atlantic, SNE, and GB sub-regions; rare in the GOM sub-region. • From approximately March-November: distributed along continental shelf edge from Cape Hatteras, NC, to GB. • From approximately December-February: distributed in continental shelf edge of the Mid-Atlantic (SNE and Mid-Atl. sub-regions).

Species	Prevalence and Approximate Months of Occurrence (if known)
Harbor Porpoise	• Distributed throughout the continental shelf waters (primarily in waters less than 150 meters) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions. • Seasonal shifts in distribution: *__July-September__: Concentrated in the northern GOM; low numbers can be found on GB. *__October-December__: widely dispersed in waters from New Jersey to Maine. *__January-March__: intermediate densities in waters off New Jersey to North Carolina (SNE and Mid-Atl sub-regions); low densities found in waters off New York to GOM. *__April-June__: widely dispersed from New Jersey to Maine
Bottlenose Dolphin:	__Western North Atlantic Offshore Stock__ • Spring-Summer: Primarily distributed along the outer continental shelf/edge-slope of the Mid-Atlantic, SNE, and GB sub-regions • Winter: Distributed in waters south of 35°N __Western North Atlantic Northern Migratory Stock__ • Summer (July-August): distributed from the coastal waters from the shoreline to approximately the 25-m isobaths between the Chesapeake Bay mouth and Long Island, New York (Mid-Atl and SNE sub-regions). • Winter (January-March): Distributed in coastal waters south of 35°N. __Western North Atlantic Southern Migratory Stock__ • Spring and Summer (April-August): distributed along coastal waters from North Carolina to Virginia (Mid-Atl and SNE sub-regions). • Fall and Winter (October-March): Distributed in coastal waters south of 35°N.

Species	Prevalence and Approximate Months of Occurrence (if known)
Pilot Whales: *Short- and Long-Finned*	**Short- Finned Pilot Whales** • Primarily occur south of 40°N (Mid-Atl and SNE sub-regions); although low numbers have been found along the southern flank of GB, but no further than 41°N. • Distributed primarily in the continental shelf edge-slope waters of Mid-Atlantic and SNE sub-regions from approximately May through December, with individuals moving to more southern waters (i.e., 35°N and south) beginning in the fall. **Long-Finned Pilot Whales** • Range from 35°N to 44°N • Winter to early spring (approximately November through April): primarily distributed along the continental shelf edge-slope of the Mid-Atlantic, SNE, and GB sub-regions. • Late spring through fall (approximately May through October): movements and distribution shift onto/within GB, the Great South Channel, and the GOM. **Area of Species Overlap:** between 38°N and 40°N (Mid-Atl and SNE sub-regions)
Notes: [1] Information is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 meter isobath. *Sources*: Waring *et al*. 1992, 2007**,** 2014**;** Payne and Heinemann 1993; Payne 1984; Jefferson *et al*. 2009.	

6.5.2.3 Pinnipeds

Status and Trends

Species of small cetaceans that occur in the affected environment of the small-mesh component of the multispecies fisheries are listed in the table below. For additional information on the biology, status, and range wide distribution of each pinniped species please refer to Waring *et al*. 2014.

Table 10. Pinniped species that occur in the affected environment of the small-mesh component of the multispecies fishery

Species	Listed Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock
Harbor Seal	No	Yes	55,409 (in U.S. waters)	unknown	No
Gray Seal	No	Yes	Unknown for U.S. waters; total Canadian population=331,000	positive	No
Harp Seal	No	Yes	Unknown for U.S. waters; total western North Atlantic stock=7.1 million	positive	No
Hooded Seal	No	Yes	Unknown for U.S. waters; minimum population size for the North Atlantic stock=512,000	unknown	No
Source: Waring *et al*. 2014					

Occurrence and Distribution

Pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. In the affected area, they are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N) (Waring *et al*. 2007, 2014). As the affected area of the multi-species fishery occurs in waters north of 35°N, and pinnipeds may be present in these waters throughout the year, the small-mesh component of the multispecies fisheries and pinnipeds are likely to co-occur in the affected area. To further assist in understanding how the multi-species fisheries overlaps in time and space with the occurrence of pinnipeds, a general overview of species occurrence and distribution in the affected environment of the small-mesh component of the multispecies fishery is provided in the following table. For additional information on the biology, status, and range wide distribution of each species of pinniped please refer to Waring *et al*. 2007, 2014.

Table 11. Pinniped occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries

Species	**Prevalence and Approximate Months of Occurrence (if known)**
Harbor Seal	• Primarily distributed in waters from New Jersey to Maine; however, increasing evidence indicates that their range is extending into waters as far south as Cape Hatteras, North Carolina (35°N). • Seasonal distribution: ***Year Round**: Waters of Maine ***September-May**: Waters from New England to New Jersey; potential for some animals to extend range into waters as far south as Cape Hatteras, NC.
Gray Seal	• Distributed in waters from New Jersey to Maine • Seasonal distribution: ***Year Round**: Waters from Maine to Massachusetts ***September-May**: Waters from Rhode Island to New Jersey
Harp Seal	• Winter-Spring (approximately January-May): Waters from Maine to New Jersey.
Hooded Seal	• Winter-Spring (approximately January-May): Waters of New England.
Sources: Waring *et al*. 2007 (for hooded seals); Waring *et al*. 2014.	

6.5.2.4 Atlantic sturgeon

Status

Five DPSs of Atlantic sturgeon that occur in the affected area are listed in the table below. For additional information on the biology, status, and range wide distribution of each distinct population segment please refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007).

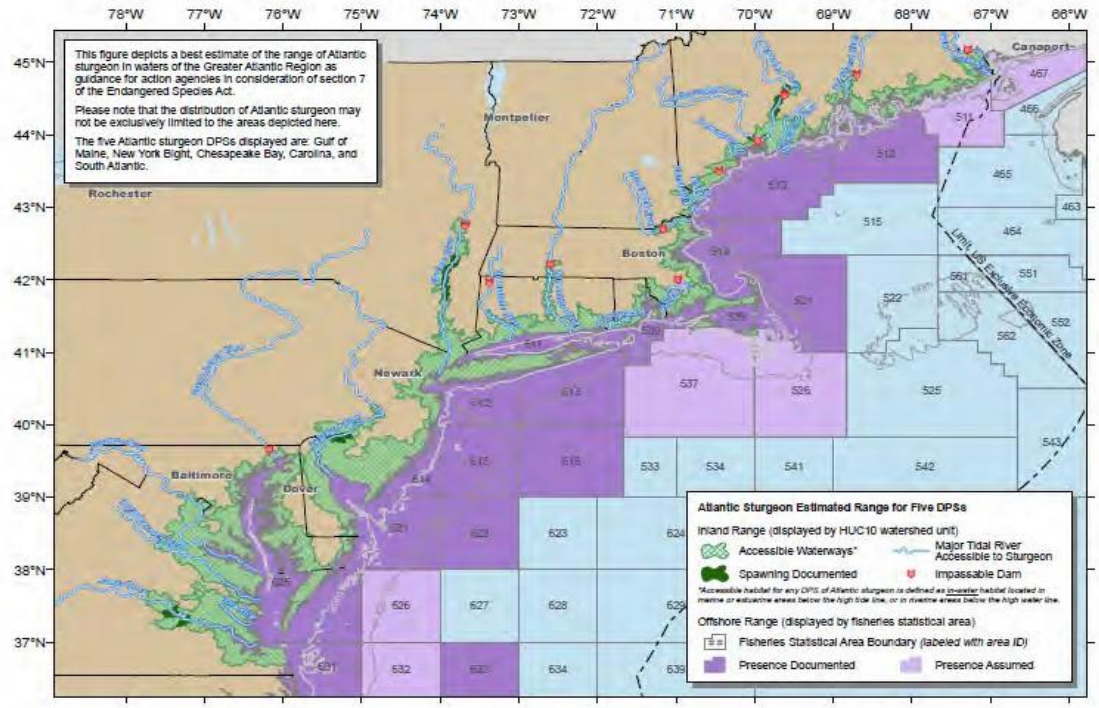
Table 12. Atlantic Sturgeon DPSs occurring in the affected environment of the small-mesh component of the multispecies fishery

Species	**Listed Under the ESA**
Gulf of Maine (GOM) DPS	threatened
New York Bight (NYB) DPS	endangered
Chesapeake Bay (CB) DPS	endangered
Carolina DPS South Atlantic (SA) DPS	endangered endangered

Occurrence and Distribution

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (Map 1; ASSRT 2007; Dovel and Berggren 1983; Dadswell *et al*. 1984; Kynard *et al*. 2000; Stein *et al*. 2004a; Dadswell 2006; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011; Wirgin *et al*. 2012; O'Leary *et al*. 2014; Waldman *et al.* 2013).

Map 6. Estimated range of Atlantic sturgeon distinct population segments (DPSs)



Source: http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/atlanticsturgeon.pdf.pdf

Based on fishery- independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein *et al*. 2004 a,b; Erickson *et al*. 2011; Dunton *et al*. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein *et al*. 2004a,b; Dunton *et al*. 2010; Erickson *et al*. 2011)). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon undertake seasonal movements along the coast. Tagging and tracking studies found that satellite-tagged adult sturgeon from the Hudson River concentrated in the southern part of the Mid-Atlantic Bight, at depths greater than 20 meters, during winter and spring, while in the summer and fall, Atlantic sturgeon concentrations shifted to the northern portion of the Mid-Atlantic Bight at depths less than 20 meters (Erickson *et al.* 2011). A similar seasonal trend was found by Dunton *et al*. 2010; analysis of fishery-independent survey data indicated a coastwide distribution of Atlantic sturgeon during the spring and fall; a southerly (e.g., North Carolina, Virginia) distribution during the winters; and a centrally located (e.g., Long Island to Delaware) distribution during the summer. Although studies such as Erickson *et al*. (2011) and Dunton *et al*. (2010) provide some indication that Atlantic sturgeon are undertaking seasonal movements horizontally and vertically along the U.S. eastern coastline, there is no

evidence to date that all Atlantic sturgeon make these seasonal movements. For instance, during inshore surveys conducted by the Northeast Fisheries Science Center in the region of the GOM, Atlantic sturgeon have been caught in the fall, winter, and spring between the Saco and Kennebec Rivers (Dunton *et al*. 2010).

Within the marine range of Atlantic sturgeon, several marine aggregation areas have been identified adjacent to estuaries and/or coastal features formed by bay mouths and inlets along the U.S. eastern seaboard; depths in these areas are generally no greater than 25 meters (Stein *et al*. 2004a; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011). Although additional studies are still needed to clarify why these particular sites are chosen by Atlantic sturgeon, there is some indication that they may serve as thermal refuge, wintering sites, or marine foraging areas (Stein *et al*. 2004a; Dunton *et al*. 2010; Erickson *et al*. 2011). The following are the currently known marine aggregation sites located within the range of the multispecies fishery:

- Waters off North Carolina, including Virginia/North Carolina border (Laney *et al*. 2007);
- Waters off the Chesapeake and Delaware Bays (Stein *et al*. 2004a; Dunton *et al*. 2010; Erickson *et al*. 2011; Oliver *et al*. 2013);
- New York Bight (e.g., waters off Sandy Hook, New Jersey, and Rockaway Peninsula, New York; Stein *et al*. 2004a; Dunton *et al.* 2010; Erickson *et al*. 2011; O'Leary *et al*. 2014;);
- Massachusetts Bay (Stein *et al.* 2004a);
- Long Island Sound (Bain *et al.* 2000; Savoy and Pacileo 2003; Waldman *et al.* 2013);
- Connecticut River Estuary (Waldman *et al.* 2013);
- Kennebec River Estuary (termed a "hot spot" for Atlantic sturgeon by Dunton *et al*. 2010).

In addition, since listing of the five Atlantic sturgeon DPSs, several genetic studies have occurred to address DPS distribution and composition in marine waters. Genetic analysis has been conducted on Atlantic sturgeon captured (fishery-independent) from aggregations in Long Island Sound and the Connecticut River (summer aggregations; Waldman *et al*. 2013), as well as the New York Bight, specifically the coastal waters off the Rockaway Peninsula (spring and fall aggregations; O'Leary *et al*. 2014). Results from these studies showed that these aggregations, regardless of location, were comprised of all 5 DPSs, with the NYB DPS consistently identified as the main contributor of the mixed aggregations, followed by the GOM, CB, SA, and Carolina DPSs. In a similar assessment, genetic analysis was conducted on Atlantic sturgeon captured (fishery-dependent) during the Northeast Fisheries Observer Program and At Sea Monitoring Program, which ranges from Maine to North Carolina. Results from this assessment affirmed that in waters of the Mid-Atlantic, all 5 DPSs co-occur (Map 2), with the percentage of each DPS estimated to be as follows: 51% NYB DPS; 22% SA DPS; 13 % CB DPS; 11% GOM DPS; 2 % Carolina DPS; and 1 % Canadian stock (Damon-Randall *et al*. 2013); however, these results have not been examined relative to the amount of observed fishing effort throughout the area. In a study by Wirgin *et al*. 2012, genetic analysis revealed that the summer assemblage of Atlantic sturgeon in Minas Basin, Inner Bay of Fundy, Canada, was comprised not only of Canadian origin Atlantic sturgeon, but also Atlantic sturgeon from the GOM DPS (34-64% contribution to the mixed assemblage) and NYB DPS (1-2% contribution to the mixed assemblage). Although additional studies are needed to further clarify the DPS distribution and composition in non-natal estuaries and coastal locations, these studies provide some initial insight on DPS distribution and co-occurrence in particular areas along the U.S. eastern sea board.

Map 7. Capture locations and DPS of origin assignments for Observer Program specimens (n=173)

Source: Map provided by Dr. Isaac Wirgin; Damon-Randall *et al*. 2013

Based on the above studies and available information, as the affected area of the multi-species fishery occurs in waters north of 35°N, and Atlantic sturgeon from any of the 5 DPSs may be present in these waters throughout the year, the small-mesh component of the multispecies fisheries and Atlantic sturgeon of the 5 DPSs are likely to co- occur in the affected area.

6.5.2.5 Atlantic salmon (Gulf of Maine DPS)

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River (Map 3), while the marine range of the GOM DPS extends from the GOM (primarily northern portion of the GOM), to the coast of Greenland (NMFS and USFWS 2005; Fay *et al*. 2006). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay *et al*. 2006; USASAC 2004; Hyvarinen *et al.* 2006; Lacroix and McCurdy 1996; Lacroix *et al.* 2004, 2005; Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993, Sheehan *et al.* 2012; NMFS and USFWS 2005; Fay *et al*. 2006). For additional information on the on the biology, status, and range wide distribution of the GOM DPS of Atlantic salmon please refer to NMFS and USFWS 2005; Fay *et al*. 2006.

Map 8. Geographic range of the Gulf of Maine DPS of Atlantic salmon

Source: NMFS and USFWS 2005

Based on the above information, as the small-mesh component of the multispecies fisheries operates throughout the year, and is known to operate in the GOM, it is possible that the fishery will overlap in time and space with Atlantic salmon migrating northeasterly between U.S. and Canadian waters.

6.5.3 Interactions Between Gear and Protected Resources

Protected species described in Section 6.5.2 are all known to be vulnerable to interactions with various types of fishing gear. In the following sections, available information on gear interactions with a given species (or species group) will be provided. As noted above, emphasis will be placed on gear types similar to those used in the small-mesh component of the Northeast Multispecies FMP (i.e., forms of trawl gear) that are known to pose a risk to protected species. As a result, the sections to follow are not a comprehensive review of all fishing gear types known to interact with a given species or a comprehensive review of gear types in the overall Northeast Multispecies FMP that pose a risk to protected species; for information on the latter, please see Framework 53.

6.5.3.1 Marine mammals

Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery.[6] The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.

6 The most recent LOF was issued August 25, 2014; 79 FR 50589.

Categorization of fisheries is based on the following two-tiered, stock-specific approach:

- **Tier 1**- considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are less than or equal to ten percent of the stock's potential biological removal rate (PBR), all fisheries associated with this stock fall into Category III.[7] -If mortality and serious injury rates are greater than ten percent of PBR, the following Tier 2, analysis occurs.

- **Tier 2** -considers fishery-specific mortality and serious injury for a particular stock. Specifically, this analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR to designate the fishery as a Category I, II, or III fishery (Table 8).

Table 13. Descriptions of the Tier 2 fishery classification categories (50 CFR 229.2)

Category	**Level of incidental mortality or serious injury of marine mammals**	**Annual mortality and serious injury of a stock in a given fishery is…**
Category I	frequent	≥50% of the PBR level
Category II	occasional	between 1% and 50% of the PBR level
Category III	remote likelihood, or no known	≤1% of the PBR level

The following discussion on fishery interactions with marine mammals (small cetaceans and pinnipeds) are in reference to the Tier 2 classifications of fisheries (Table 8).

Small Cetaceans and Pinnipeds

Small cetaceans and pinnipeds are found throughout the waters of the Northwest Atlantic (see Section 1.1.2). As they feed, travel and breed in many of the same ocean areas utilized for commercial fishing, they are at risk of becoming entangled or bycaught in various types of fishing gear (e.g., gillnet, bottom trawl, pelagic long-line, trap/pot), with interactions resulting in serious injury or mortality to the animal. As noted above, the small-mesh multispecies fishery is executed by the use of bottom trawl gear. As the LOF has identified several trawl fisheries as Category II fisheries, the potential exists for marine mammals to be incidentally injured or killed by trawl gear used in the small-mesh multispecies fishery. Table 9 identifies several Category II trawl fisheries that exist in the affected environment as well as provides information on the most recent mean annual mortality estimates for those species observed incidentally injured/killed in the fishery from 2007-2011.[8] This table does not provide a comprehensive list of all species affected by each fishery, it only addresses those species that occur in the affected environment of the small-mesh multispecies fishery and have the potential to interact with gear similar to that used in this component of the Northeast Multispecies FMP (trawl gear; Section 6.5.2). For a comprehensive list of species affected by all Category I and II fisheries (See the recently issued LOF).

7 PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

8 For additional information on those species observed incidentally injured or killed in a particular fishery prior to 2007, please refer to Waring *et al*. 2014.

Table 14. Small cetacean and pinniped species observed seriously injured and/or killed by Category II fisheries in the affected environment of the small-mesh multispecies fishery. A (1) indicates those species driving the fisheries classification.

Category II			
Gear Type	**Species Observed Injured/Killed**	**Observed in 2007-2011**	**Mean Annual Mortality**
Mid-Atlantic Mid-Water Trawl-Including Pair Trawl	Bottlenose dolphin (offshore)	N	N/A
	Risso's dolphin	Y	0.2
	White-sided dolphin (1)	Y	6
	Short-beaked common dolphin	Y	0.6
	Long and short-finned pilot whales	Y	2.4
	Gray seal	Y	0.2
	Harbor seal	Y	0.2
Northeast Mid-Water Trawl-Including Pair Trawl	White-sided dolphin	N	N/A
	Short-beaked common dolphin	N	N/A
	Long and short-finned pilot whales (1)	Y	4
	Harbor seal	Y	0.7
Northeast Bottom Trawl	Harp seal	Y	0.4
	Harbor seal	Y	0.8
	Gray seal	Y	9.2
	Long and short-finned pilot whales	Y	10
	Short-beaked common dolphin	Y	19
	White-sided dolphin (1)	Y	73
	Harbor porpoise	Y	4.5
	Bottlenose dolphin (offshore)	Y	20
	Risso's dolphin	Y	2.5
Mid-Atlantic Bottom Trawl	White-sided dolphin	Y	4
	Long and short-finned pilot whales (1)	Y	26
	Short-beaked common dolphin (1)	Y	96
	Risso's dolphin (1)	Y	42
	Bottlenose dolphin (offshore)	Y	20

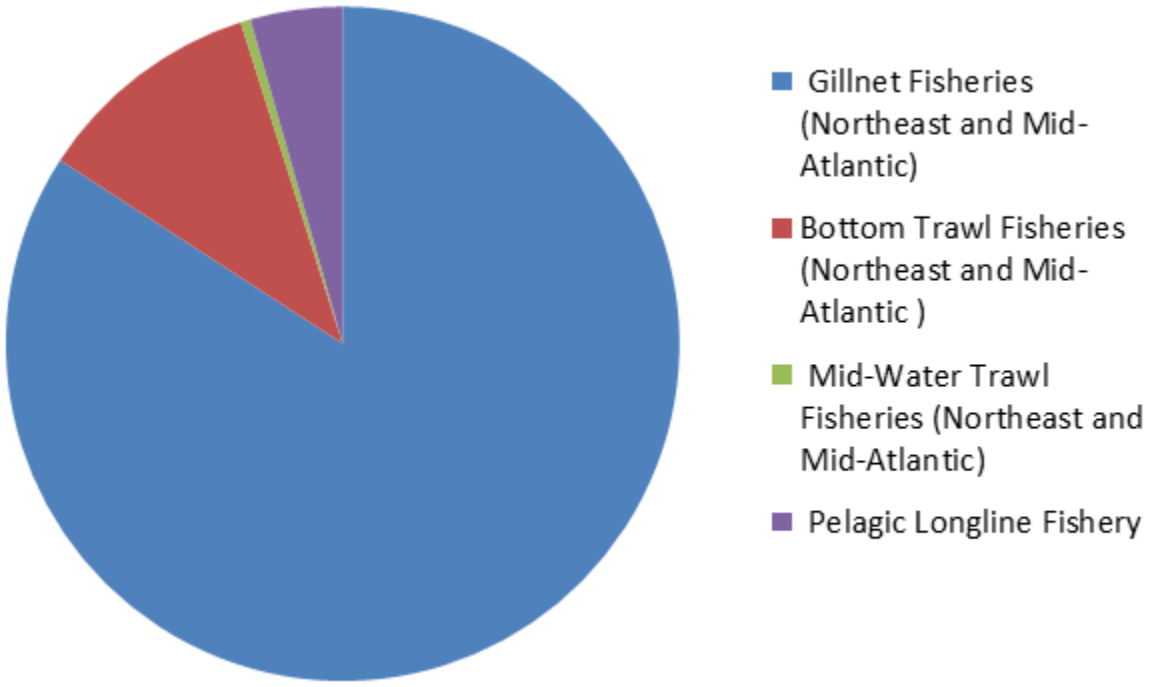
	Harbor seal	Y	0.2
Notes:			

[1] Based on observer data from 2007-2011, estimates of serious injury and estimates of mortality are provided for every year of observation in Waring *et al*. 2014. Estimated "combined mortality" per year of observation is also provided in Waring *et. al* 2014; this is equal to the "estimated serious inury" + "estimated mortality" for every year observed. The "mean annual mortality" is the average of each "estimated combined mortality" value over the 5 year period of observation (Waring *et al.* 2014).

Sources: Waring *et al*. 2014; August 25, 2014, List of Fisheries (79 FR 50589).

Based on the information provided in Table 9, it is apparent that there are multiple Category II trawl fisheries in the affected environment of the small-mesh multispecies fishery that result in the serious injury and morality of small cetaceans and pinnipeds; however, as provided in the LOF, these are just a fraction of the fisheries (Category I and II) that are known to affect protected resources. Taking into consideration the LOF and the observed incidental marine mammal serious injury and mortalities in these fisheries from 2007-2011 (Waring et al. 2014), approximately 84% of the total mean annual mortality to marine mammals (small cetaceans + seals, large whales excluded) is attributed to gillnet fisheries (Category I), followed by bottom trawl (10.94%; Category II), pelagic longline (4.42%; Category I) and mid-water trawl (0.48%; Category II) fisheries (Figure 1).

Figure 5. Total mean annual mortality of small cetaceans and pinnipeds by Category I and II fisheries, 2007-2011

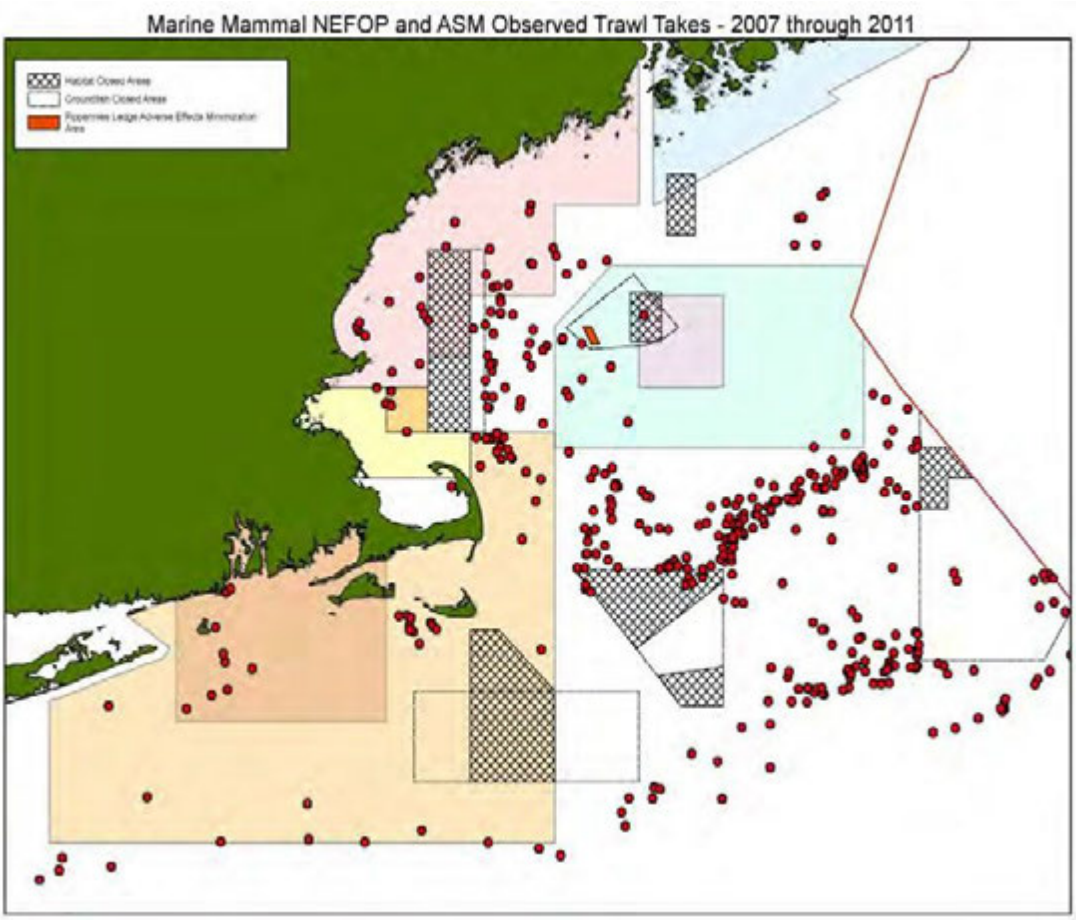


Although there are multiple fisheries (Category I and II; see LOF, 79 FR 50589) that result in the serious injury and morality of small cetaceans and pinnipeds, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For example, the following map depicts observed marine mammal takes (large whales excluded) in trawl gear in the GOM, GB, and SNE sub-regions of the multispecies fisheries from 2007-2011.[9] Over the last 5 years,

9 Additional maps of marine mammal takes in various fishing gear can be found in Waring *et al*. 2014.

there appears to be particular areas of the GOM, GB, and SNE sub-regions where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence. Although uncertainties, such as shifting fishing effort patterns and data on true density (or even presence/absence) for some species, remain, the available observer data (Map 4) provides insight into areas in the ocean where the likelihood of interacting with a particular species is high and therefore, provides a means to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds.

Map 9. Map of marine mammal bycatch in trawl gear in the New England region (excluding large whales) observed by traditional fishery observers and at sea monitors between 2007 and 2011



Notes: Small cetacean and pinnipeds observed taken primarily in: (1) the waters between and around CA I and CA II (Groundfish closed areas): Short-beaked common dolphin, pilot whales, white-sided dolphins, gray seals, and some risso's dolphins and harbor porpoise; and (2) eastern side of the GOM Habitat/Groundfish closed area: White-sided dolphins, and some pilot whales and harbor seals.

6.5.3.2 Sea turtles

Sea turtles are widely distributed in the waters of the Northwest Atlantic (Section 6.5.2). As a result, sea turtles often occupy many of the same ocean areas utilized for commercial fishing and therefore, interactions with fishing gear are possible. Sea turtles have been incidentally injured or killed in various gear types (e.g., gillnets, trawls, hook and line gear, dredge); however, of the gear types that could be possibly used in the small-mesh multispecies fishery, trawls pose the greatest risk to sea turtles and therefore, will be the focus of the following discussion. In addition, although sea turtle interactions with trawl gear have been observed in waters from the GOM to the Mid-Atlantic, most of the observed interactions have occurred in the Mid-Atlantic. As few sea turtle interactions have been observed in the GOM and GB regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl gear in these regions and therefore, produce a bycatch estimate for these regions. As a result, the following bycatch estimates are based on observed sea turtle interactions in trawl gear in the Mid-Atlantic.

In a study done by Warden (2011a), it was estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., i.e., south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border) was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but being released through a Turtle Excluder Device.[10] Of the 292 average annual observable loggerhead interactions, approximately 44 of those were adult equivalents (Warden 2011a).[11] This estimate is a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated to be 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a). Warden (2011b), using species landed, also estimated total loggerhead interactions attributable to managed species. Five loggerhead interactions (estimated observable and unobservable but quantifiable) were attributed to Northeast multispecies. In addition, green, Kemp's ridley, and leatherback sea turtles have been documented in bottom trawl gear in areas that overlap with the Northeast groundfish fishery (NEFSC FSB database). One of these, a leatherback sea turtle, was captured on trip where the top landed species was whiting, while another sea turtle (unknown species) was captured on trip where the top landed species was pollock.

Although sea turtles have the potential to interact with multiple gear types, such as trawl gear, the risk of an interaction is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, environmental conditions, and sea turtle occurrence and distribution. Murray and Orphanides (2013) recently evaluated fishery-independent and dependent data to identify environmental conditions associated with turtle presence and the subsequent risk of a bycatch encounter if fishing effort is present; It was concluded that fishery independent encounter rates were a function of latitude, sea surface temperature (SST), depth, and salinity. When the model was fit to fishery dependent data (gillnet, bottom trawl, and scallop dredge), Murray and Orphanides (2013) found a decreasing trend in encounter rates as latitude increases; an increasing trend as SST increases; a bimodal relationship between encounter rates and salinity; and higher encounter rates in depths between 25 and 50 m. Similarly, Murray (2013) concluded, based on 2007-2011 data obtained on loggerhead interactions in gillnet gear, that bycatch rates were associated with latitude, SST, and mesh size, with highest interaction rates in the southern mid-Atlantic in warm surface waters and in large (>7 inch mesh). Based on the above 2005-2008 data

10 Warden (2011) and Murray (2013) define the mid-Atlantic slightly differently, but both include waters north to Massachusetts. See the respective papers for a more complete description of these areas.

11 Adult equivalence considers the reproductive value of the animal (Warden 2011, Murray 2013), providing a "common currency" of expected reproductive output from the affected animals (Wallace et al. 2008), and is an important metric for understanding population level impacts (Haas 2010).

obtained on loggerhead interactions in bottom trawl gear, Warden (2011a) also found that latitude, depth and SST were associated with the interaction rate, with the rates being highest south of 37° N in waters < 50 meters deep and SST > 15°C (Table 10).

Table 15. Mid-Atlantic trawl bycatch rates (Warden 2011a)

Latitude Zone	Depth, SST	Loggerheads/Day Fished
<37 °N	<=50 m, <=15° C	0.4
	<=50 m, >=15° C	2.06
	>50 m, <= 15° C	0.07
	>50 m, >15° C	0.09
37 - 39 °N	<=50 m, <=15° C	0.04
	<=50 m, >=15° C	0.18
	>50 m, <= 15° C	0.01
	>50 m, >15° C	0.07
>39 °N	<=50 m, <=15° C	<0.01
	<=50 m, >=15° C	0.03
	>50 m, <= 15° C	<0.01
	>50 m, >15° C	0.01

6.5.3.3 Atlantic sturgeon

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida (Section 6.5.2). All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range, although genetic analyses suggests that the distribution of each varies within that range (King *et al*. 2001; Laney *et al*. 2007; Dunton *et al*. 2012; Wirgin *et al*. 2012; Waldman *et al*. 2013; O'Leary *et al*. 2014). Three separate publications using different information sources reached the same conclusion; Atlantic sturgeon occur primarily in waters less than 50 meters (although deeper waters are also used), aggregate in certain areas, and exhibit seasonal movement patterns (see Stein *et al*. 2004b; Dunton *et al*. 2010; Erickson *et al*. 2011; see Section 1.1.2 for additional details). These characteristics of Atlantic sturgeon occurrence and distribution result in Atlantic sturgeon occupying many of the same ocean areas utilized for commercial fishing and therefore, occupying areas in which interactions with fishing gear are possible.

There are three documents, covering three time periods, that use data collected by the Northeast Fisheries Observer Program to describe bycatch of Atlantic sturgeon: Stein *et al*. (2004b) for 1989-2000; ASMFC (2007) for 2001-2006; and Miller and Shepard (2011) for 2006-2010; None of these provide estimates of Atlantic sturgeon bycatch by DPS. Information provided in all three documents indicate that sturgeon bycatch occurs in gillnet and trawl gear, with the most recent document estimating, based on fishery observer data and VTR data from 2006-2010, that annual bycatch of Atlantic sturgeon was 1,342 and 1,239, respectively (Miller and Shepard 2011). Specifically, Miller and Shepard (2011) observed Atlantic sturgeon interactions in trawl gear with small (< 5.5 inches) and large (≥ 5.5 inches) mesh sizes, as well as gillnet gear with small (< 5.5 inches), large (5.5 to 8 inches), and extra-large mesh (>8 inches) sizes. Although Atlantic sturgeon were observed to interact with trawl and gillnet gear with various mesh sizes, based on observer data, Miller and Shepard (2011) concluded that gillnet gear, in general, posed a greater risk of mortality to Atlantic sturgeon than did trawl gear. Estimated mortality rates in gillnet gear were 20.0%, while those in otter trawl gear were 5.0% (Miller and Shepard 2011). Similar conclusions were

reached in Stein *et al*. 2004b and ASMFC 2007 reports, in which both studies also concluded, after review of observer data from 1989-2000 and 2001-2006, that observed mortality is much higher in gillnet gear than in trawl gear.

Although Atlantic sturgeon deaths have rarely been reported in otter trawl gear (ASMFC 2007), it is important to recognize that effects of an interaction may occur long after the interaction. Based on physiological data obtained from Atlantic sturgeon captured in otter trawls, Beardsall *et al*. (2013) suggests that factors such as longer tow times (i.e., > 60 minutes), prolonged handling of sturgeon (> 10 minutes on deck), and the type of trawl gear/equipment used, may increase the risk of physiological disruption or impairment (e.g., elevated cortisol levels, immune suppression, impaired osmoregulation, exhaustion) to Atlantic sturgeon captured in otter trawls and therefore, may result in an increased risk of post-release mortality. The authors also note that post-release exhaustion, even after a 60 minute trawl capture, results in behavioral disruption to Atlantic sturgeon and caution that repeated bycatch events may compound post-release behavioral effects to Atlantic sturgeon which in turn, may effect essential life functions of Atlantic sturgeon (e.g., predator avoidance, foraging, migration to foraging or spawning sites) and therefore, Atlantic sturgeon survival (Beardsall *et al*. 2013). Although the study conducted by Beardsall *et al*. (2013) provides some initial insight into the post-release effects to Atlantic sturgeon captured in trawl gear, additional studies are needed to clearly identify the "after" effects of a trawl interaction. As it is remains uncertain what the overall impacts to Atlantic sturgeon survival are from trawl interactions, trawls should not be completely discounted as a form of gear that poses a mortality risk to Atlantic sturgeon.

6.5.3.4 Atlantic salmon

The marine range of the GOM Distinct Population Segment extends from the GOM (primarily northern portion), to the coast of Greenland (NMFS and USFWS 2005; Fay *et al*. 2006) (Section 6.5.2). Although the distribution of Atlantic salmon in the marine environment likely overlaps with commercial fisheries, there have been a low number of observed interactions with fisheries and various gear types. According to the Biological Opinion issued by NMFS Greater Atlantic Regional Fisheries Office on December 16, 2013, NMFS Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer and At-Sea Monitoring Programs documented a total of15 individual salmon incidentally caught on over 60,000 observed commercial fishing trips from 1989 through August 2013 (NMFS 2013;Kocik *et al*. 2014). Specifically, Atlantic salmon were observed bycaught in gillnet (11/15) and bottom otter trawl gear (4/15), with 10 of the incidentally caught salmon listed as "discarded" and five reported as mortalities (Kocik (NEFSC), pers. comm. (February 11, 2013) in NMFS 2013). The genetic identity of these captured salmon is unknown; however, the NMFS 2013 Biological Opinion considers all 15 fish to be part of the GOM Distinct Population Segment, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts).

The above information, specifically the very low number of observed Atlantic salmon interactions in gillnet and trawl gear reported in the Northeast Fisheries Observer Program's database (which includes At-Sea Monitoring data), suggests that interactions with Atlantic salmon are rare events (NMFS 2013; Kocik *et al*. 2014); however, it is important to recognize that observer program coverage is not 100 percent. As a result, it is likely that some interactions with Atlantic salmon have occurred, but have not been observed or reported.

6.6 Fishery-Related Businesses and Communities

More detailed information on fishery-related businesses and communities can be found in Amendment 19 and the SAFE Report for Fishing Year 2013 (NEFMC 2014). Landings and revenues of silver hake in the northern and southern area have been increasing since 2006. Landings in the northern are have been greater than 1,000 mt, earning $1.2 – 2.3 million in revenue. Landings in the southern area have ranged from 5,732,019lb to 28,660,094 lb(in 2009), earning $7.6 – 15.5 million in revenue. Most of the high landings on trips targeting whiting are made by vessels fishing along the Mid-Atlantic continental shelf edge and along the southern edge and eastern portion of Georges Bank. Almost all trips landing more than 28,000 lbs. and targeting whiting occurred in the Southern New England Exemption Area. Trips targeting whiting and landing less than 28,000 lbs. are more spread out. These are spread out along the Southern New England shelf edge and also within statistical area 537. There is an increasing trend of trips
targeting whiting in the southern stock area and landing closer to 30,000 lbs.

Landings and revenue of red hake have generally increased since 2006 (Figure 5). The lowest red hake landings in the Northern area occurred in 2008 with only 19,841lb landed and earning $7,865 in revenue. In recent years, landings in the northern area have been less than 220,462 lb, earning $300,000–400,000 in revenue. The majority of total red hake landings have occurred in the Southern area. Since 2006, landings and revenue of red hake in the Southern area have generally increased, with landings in recent years over 1,102,311 lband earning revenue of $380,000 – 490,000.

New Bedford, MA reported the highest total landings of silver hake in 2009 and 2010 (1,746 and 1,933 mt). New Bedford also has the highest total revenue from silver hake in 2010 and the second-highest in 2009 (behind Montauk, NY). Montauk, NY and Point Judith, RI made up the other two most successful ports in terms of silver hake revenue and landings in 2009 and 2010 (Figure 6). Since 2010, the top three ports in terms of small-mesh trawl revenue have been New Bedford, MA, Montauk, NY and Point Judith, RI, respectively. Total revenue has dropped moderately since 2010 in these three ports, and an increase in small-mesh trawl revenue in New London, CT almost surpassed the revenue in Point Judith, RI in 2012.

The number of vessels landing small-mesh multispecies has been steadily decreasing since 1996 (Figure 7), from 736 vessels in 1996 to 381 vessels in 2013. However, while there has been an overall decrease since 1996, the number of vessels landing small-mesh multispecies has increased in recent years, from a low of 336 vessels in 2005. A similar trend is seen in the number of dealers reporting buying small-mesh multispecies, ranging from a high of 140 dealers in 1996, to a low of 78 in 2005, and back up to 92 in 2013. The highest number of unique permits landing silver, offshore or red hake were highest Gloucester, MA, Point Judith, RI and Montauk, NY (in 2009 and 2010).

Figure 6. Small-mesh revenue and landings by stock area.

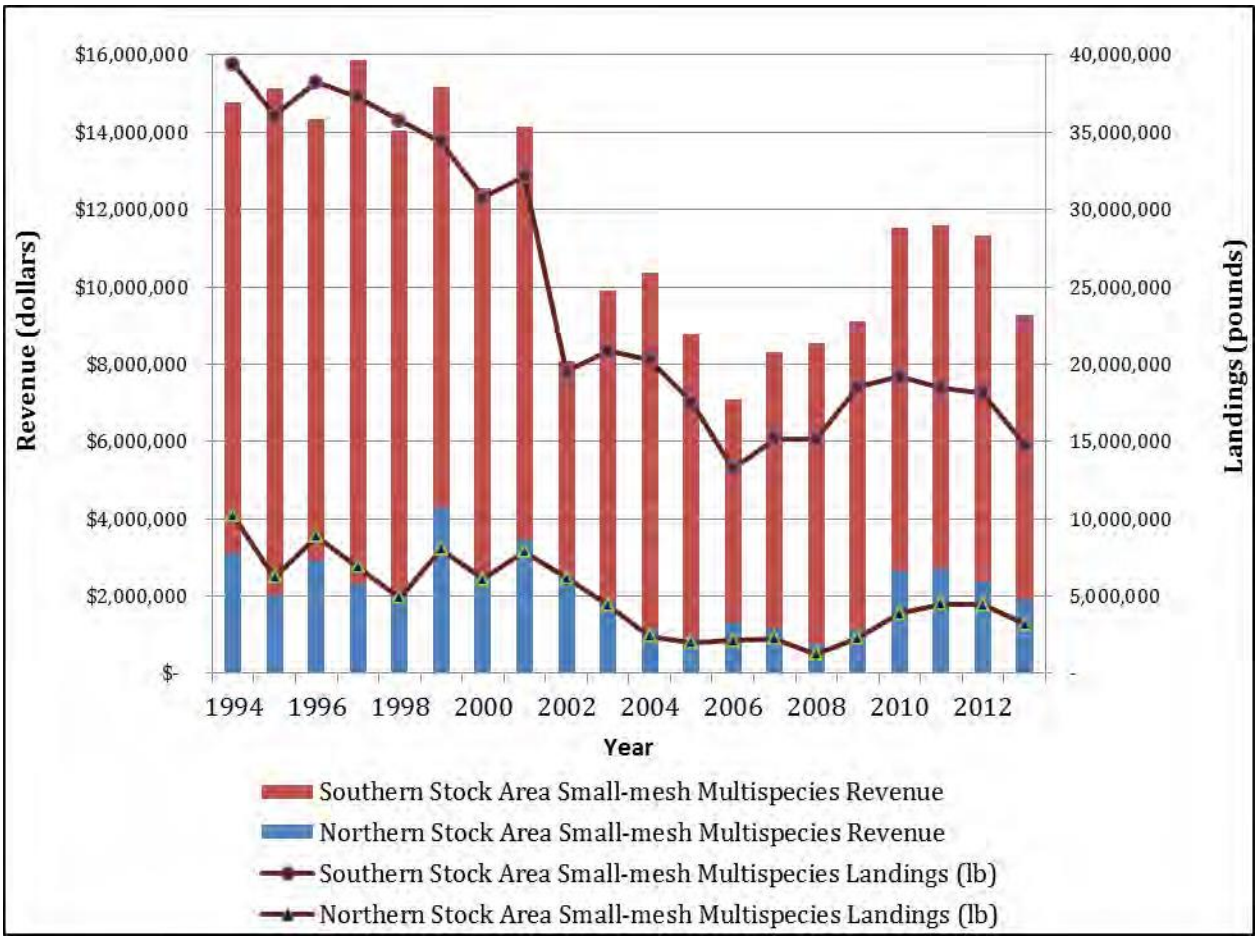


Figure 7. Trends in small-mesh revenue by port of landing.

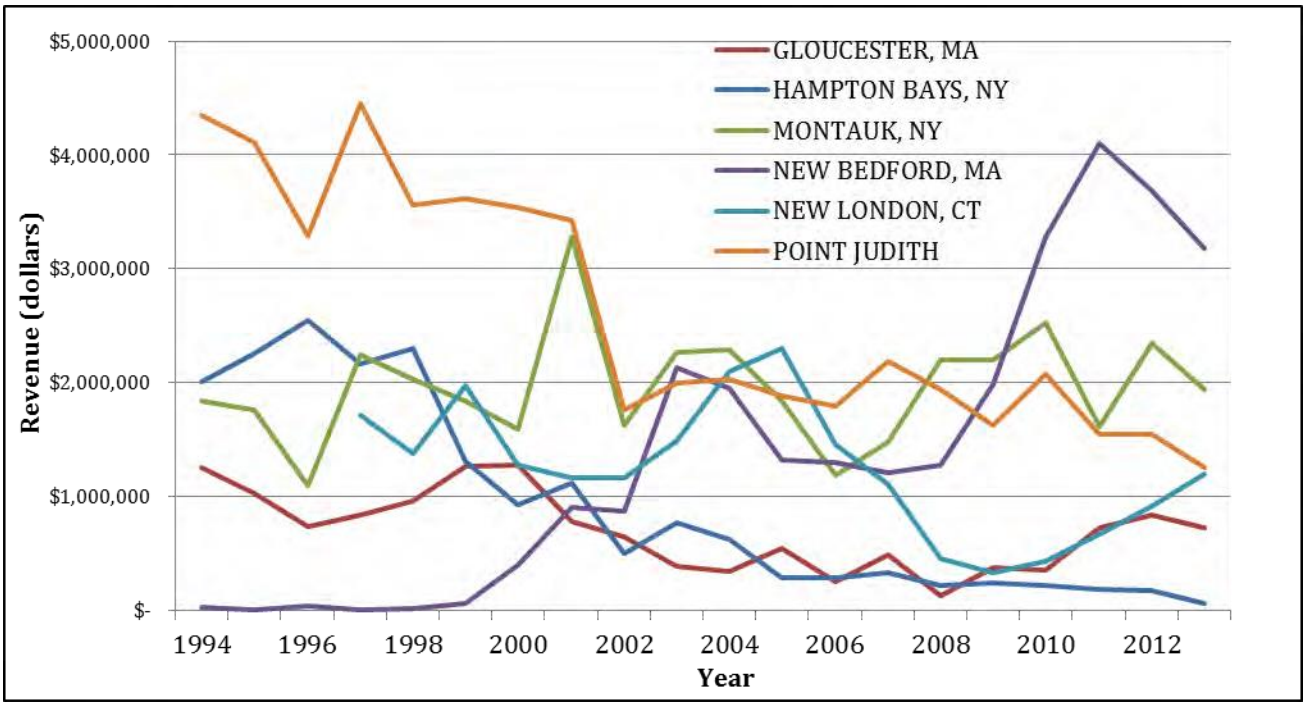
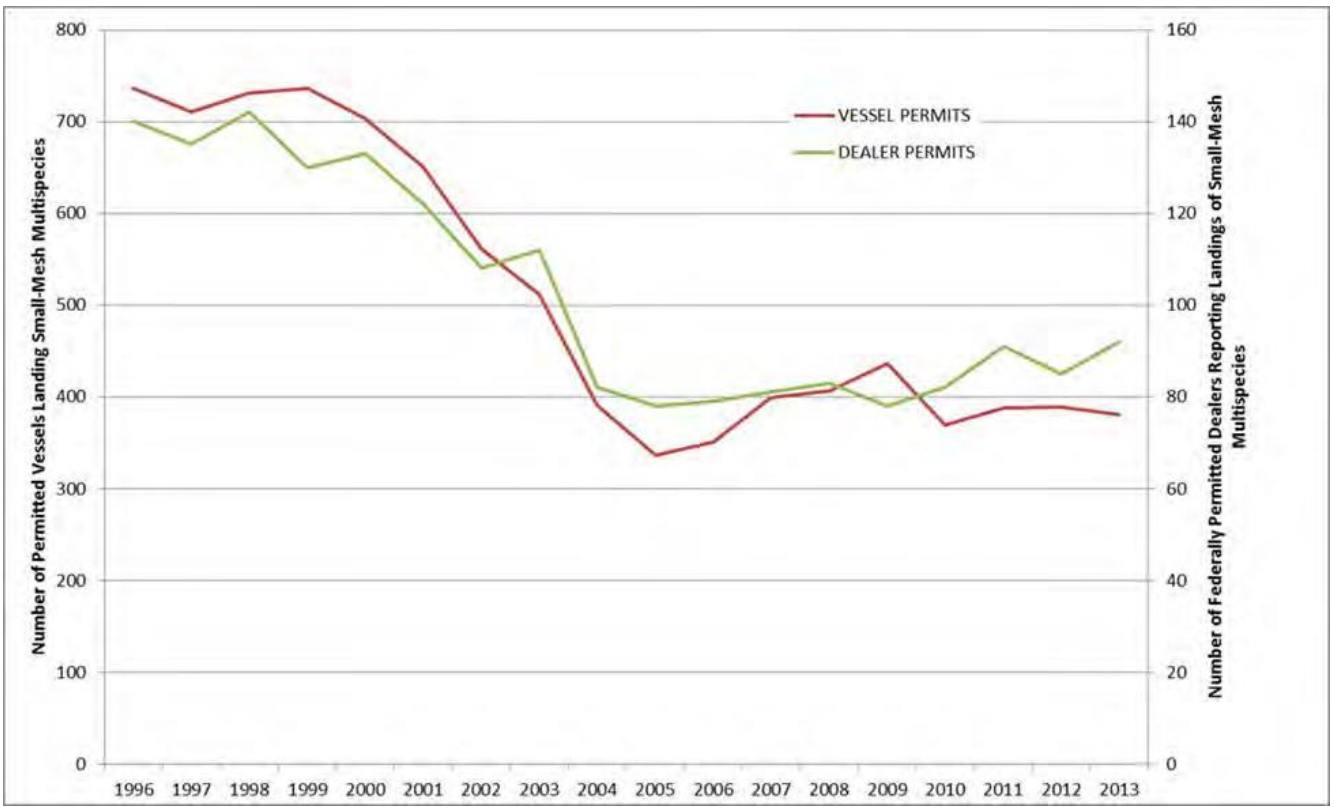


Figure 8. Number of federally permitted vessels and dealers reporting small-mesh multispecies by calendar year.



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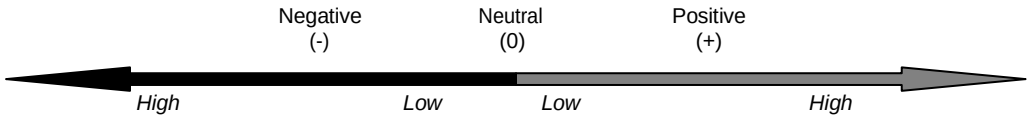
7.0 ANALYSIS OF IMPACTS ON VECS

This EA evaluates the potential impacts using the criteria outlined in the following table. Impacts from all alternatives are judged relative to the baseline conditions, as described in Section 6.0, and compared to each other.

Table 16. Impact definitions and qualifiers

Impact Definition			
	Direction		
VEC	**Positive (+)**	**Negative (-)**	**Neutral (0)**
Red Hake Stocks, Silver and Offshore Hake Stocks, Non-target Species and Bycatch, and Protected Resources	**Actions that increase stock/population size**	**Actions that decrease stock/population size**	**Actions that have little or no positive or negative impacts to stocks/populations**
Physical Environment and EFH	Actions that improve the quality or reduce disturbance of habitat	Actions that degrade the quality or increase disturbance of habitat	Actions that have no positive or negative impact on habitat quality
Fishery Related Businesses & Communities	Actions that increase revenue and social well-being of fishermen and/or associated businesses	Actions that decrease revenue and social well-being of fishermen and/or associated businesses	Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses
Impact Qualifiers:			
Low (L, as in low positive or low negative)	To a lesser degree, but not significant		
High (H; as in high positive or high negative)	To a substantial degree, but not significant		
Likely	Some degree of uncertainty associated with the impact		



7.1 Red Hake Stocks

7.1.1 ACL Specifications

7.1.1.1 Updated specifications (preferred)

The proposed 2015-2017 red hake specifications (Table 6) are either slightly above or slightly below the previous specifications. For northern red hake (stock areas shown in Map 1), recent catches have been above the current ABC, as well as the proposed, slightly higher ABC. Despite catches exceeding catch

limits, the biomass of northern red hake appears to be increasing in 2014. The proposed specifications are set at a level that is appropriate for the current stock biomass, managing the risk that overfishing would occur as long as catches are less than or equal to the ACL. Unlike other stocks, red hake are targeted to supply a local bait market and some trips therefore target red hake or sell the incidental red hake catch on trips targeting silver hake. The catch limits coupled with in-season accountability measures influence fishing behavior therefore are effective in preventing overfishing. The proposed ACL for the northern stock of red hake is 2.6% higher than No Action and is set at a level that is appropriate for the updated stock biomass estimate. The proposed ACL specifications prevent overfishing and thus are expected to have a positive biological impact on the northern red hake stock, but since they allow for higher catches than under current specifications, **the alternative is expected to have a low negative (but insignificant) biological impact on the northern red hake stock compared to No Action**.

Southern red hake catches have been comfortably below the catch limits in recent years, somewhat constrained by low market demand and price. Recent catches have also been restrained because some major fishery participants have been conducting vessel overhauls. The proposed ACL is 2.4% lower than No Action and is set at a level that is appropriate for the updated stock biomass estimate. As such, **the proposed specifications are expected to result in a low positive, but insignificant biological impact on the southern stock of red hake compared to No Action**.

Table 17**.** Differences between the proposed ACL specifications and the No Action ACL specifications.

Stock		2012-2014 Specifications (mt)	2015-2017 Specifications (mt)	Percent Change
Northern Red Hake	ABC	280	287	+2.6%
	ACL	266	273	+2.6%
	TAL	90.3	104.2	+15.4%
Southern Red Hake	ABC	3,259	3,179	-2.4%
	ACL	3,096	3,021	-2.4%
	TAL	1,336	1,309.4	-2%

7.1.1.2 No Action

For the northern red hake stock, the No Action specifications (Table 6) are lower than the proposed 2015-2017 specifications. These specifications would be more restrictive than otherwise necessary, but are still within catch limits based on the best available science. For that reason, and given the current status of the stock, the **No Action specifications are expected to result in low positive, but insignificant biological impacts**, since the lower catch limit would further reduce the risk of overfishing by setting a management target that would be more risk adverse than the specifications formula would otherwise allow.

For the southern red hake stock, the No Action specifications (Table 6) are higher than the most recent recommendation from the SSC. These specifications are, therefore, higher than is sustainable for these stocks and is inconsistent with the requirements of the FMP and the Magnuson-Stevens Act. However, catches in the southern area are well below both the proposed and No Action specifications and are not expected to increase to this level in the coming years. **Therefore, the No Action specifications are expected to result in neutral biological impacts, given the current catches and status of the southern red hake stock.**

7.1.2 Northern red hake possession limits

Several alternatives are proposed in Section 5.2 to address the risk of continued overfishing of northern red hake. The effectiveness of these alternatives to reduce northern red hake catch below the proposed 2015-2017 ACL is evaluated in the following sections. Catches that continue to exceed the ACL are risky and may cause overfishing to continue, which would have negative effects on the northern red hake stock. Catches that are below the ACL are less risky and are unlikely to cause overfishing. The catches of southern red hake have been, and are likely to be, well below the proposed ACL, so the impacts these alternatives on the southern red hake stock is expected to be neutral compared to the No Action. Similarly, since the catches of southern red hake have been, and are likely to be, well below the proposed ACL these alternatives would also have neutral impact on southern red hake compared to each other.

Two of the alternatives would also correct for previous underestimates of red hake ACLs in 2012-2014, which caused the AM trigger to be adjusted to a lower level than should have occurred. These alternatives would increase the AM trigger from 45% of the TAL to 62.5% of the TAL to account for the 39 mt ACL underestimate, as described in Section 5.2.2.

These alternatives would increase restrictions on possession, so their intent is to modify fishing behavior to catch less northern red hake by reducing the incentive to fish in areas where and seasons when red hake are more abundant. Lower possession limits would also discourage fishing trips that target red hake, rather than silver hake and other species. Industry advisors say that changing the possession limits will be effective and less costly than other means to reduce red hake catches (i.e., changes in exemption area seasons or boundaries, or by requiring untested fishing gears.)

A sensitivity analysis was performed to attempt to quantify the potential effects of various possession limits, applying the proposed management rules to landings reported on VTRs for fishing year 2011-2013 trips which landed red or silver hake, or both. This analysis included trips that fished with small-mesh trawls or any other gear. It assumed that the number of trips would remain constant, but that trips targeting red hake would stop fishing (reducing both catch and landings) when the landings exceeded the proposed possession limit.

Trips where red hake contributed to less than half of the landings were assumed to continue fishing (for a different target species), discarding the excess red hake and reducing landings, but not catch. Trips with less than 25% of total landings from red hake were assumed to discard 100% of the excess fish. Trips having between 25 and 50% of the landings from red hake were assumed to discard excess red hake, using a linear function between 100 and 0 percent (Figure 8). Trips where red hake were more than 50% of total landings were assumed to stop fishing or change fishing activity to avoid the excess, without any mitigation from increasing trip frequency.

An additional sensitivity analysis was also performed assuming that the excess fish were not discarded on any trip (Figure 9), regardless of targeting, i.e. the vessel fished in different areas or times to avoid catching the excess red hake. Although an unlikely outcome, this is a most favorable scenario that brackets the potential response to various possession limits. Conversely, another sensitivity analysis was performed assuming that trips that did not target red hake (i.e. when red hake landings were less than 50% of total landings) discarded all of the excess fish (Figure 10), i.e. the vessel did not change fishing behavior at all. This is considered to be a worst case scenario where only vessels that target red hake which contribute to a high proportion of landings would stop fishing or change fishing behavior to avoid catching excess red hake.

Figure 9. Assumed discard rate of landings exceeding a possession limit in relation to the ratio of red hake to total landings on a trip.

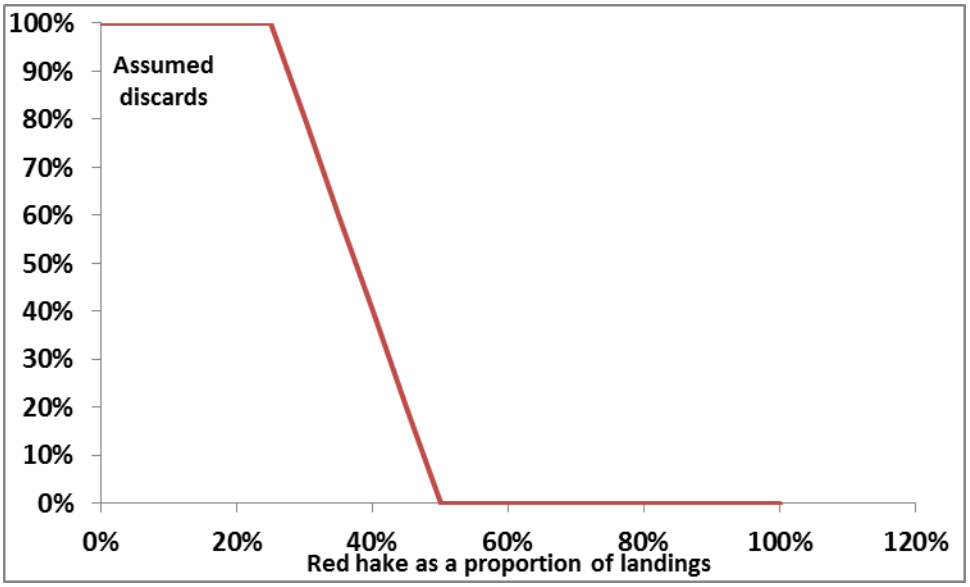


Figure 10. Most favorable scenario – assumed discard mortality of red hake in excess of applicable possession limit.

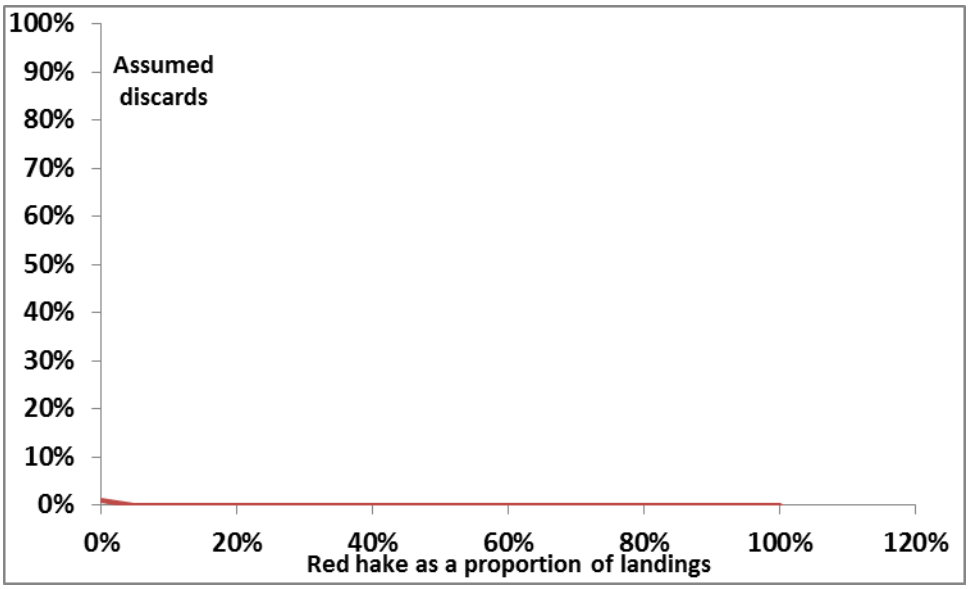
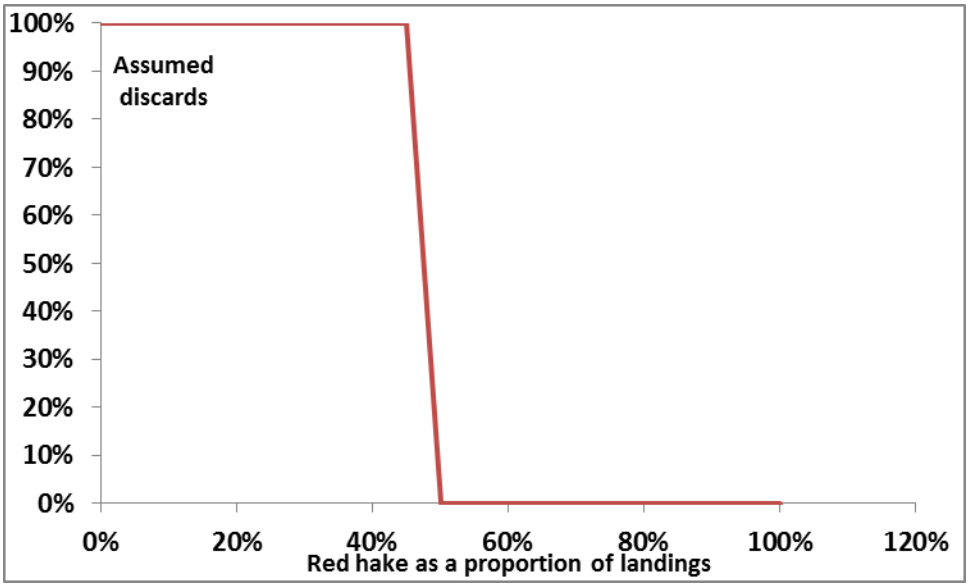


Figure 11. Worst case scenario – assumed discard mortality of red hake in excess of applicable possession limit.



Although the analysis used landings to estimate the effects, total catch was taken into account by applying a constant discard rate (estimated total annual discards divided by total catch). As it turned out, the results showing how much the catch exceeded the proposed 2015 ACL (273 mt) is very sensitive to this estimated discard rate[12]. This ratio was 41.7% in 2011, 73.0% in 2012, and 68.2% in 2013 (see table below). Because of this influence of the discard rate on achievement of an ACL threshold, another sensitivity analysis was performed using the 2011-2013 average discard rate of 60.6% of total catch, a level that is consistent with an average discard rate since 2006 (Figure 11).

Table 18. Northern red hake annual discard rate and estimated catch as a proportion of the proposed 273 mt ACL for 2015.

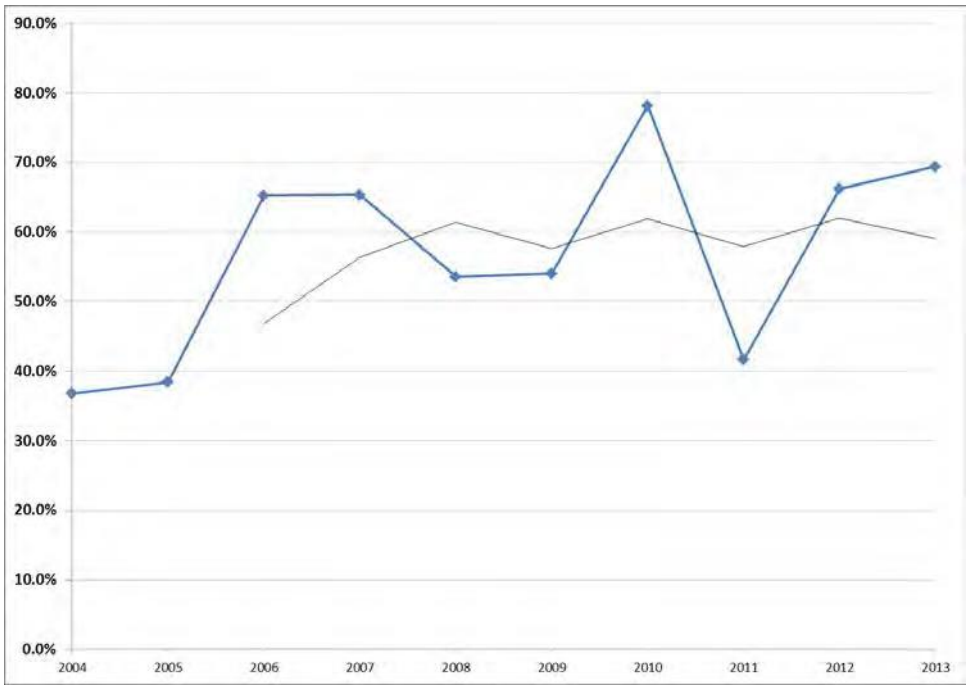
Fishing year	Discard rate	Catch/2015 ACL
2011	42%	77%
2012	73%	130%
2013	68%	111%

To account for the potential variability and uncertainty in the fishery data, the analysis was performed on individual years from 2011 to 2013, allowing comparisons across the proposed alternatives using different data and a range of potential fishery conditions. The northern red hake discard rate since 2004 has varied from around 40% to almost 80%, averaging around 60% since 2008 (see figure below)[13]. The discard rate in 2012 and 2013 was affected by the imposition of a 400 lbs. northern red hake possession limit in September, which may have caused the ratio to increase, although the ratio was actually higher in 2010 when there was no possession limit.

[12] The discard rate is the total annual discard estimate divided by total annual catch.

[13] The model evaluates the effect on individual trips taken in a fishing year, not 'average' trips. Combining the results in an average would fail to account for interannual variability and uncertainty.

Figure 12. Northern red hake discard trend (total discards/total catch) from calendar year 2004-2013. NEFMC 2014.



7.1.2.1 Reduced northern red hake possession limit and correct AM trigger (Section 5.2.1; preferred)

This alternative would reduce the northern red hake possession limit to 3,000 lbs. when 62.5% of the TAL is projected to have been landed, with the intent of reducing the opportunity or incentive for fishermen to target red hake. With a lower possession limit, revenue from red hake landings would be less and fishermen would be more likely to target silver hake on small-mesh trawl trips or other species with other gears (provided they have the appropriate fishing permits). A further reduction in the red hake possession limit to 1,500 lbs. would occur when landings reach 45% of the TAL (i.e. at the current AM trigger). This alternative also would increase the AM trigger to 62.5% of the TAL, correcting for the 39 mt underestimate of the 2012-2014 ABC described in Section 5.2.1. The 400 lbs. in-season AM would go into effect when landings reach 62.5% of the TAL for the remainder of the fishing year.

On one hand, this strategy reduces landings and potentially reduces catch (on trips targeting red hake) early in the season. On the other hand, the alternative would potentially delay the time when the AM is triggered, allowing more red hake catch to be landed later in the season. To estimate these effects and compare the results to the No Action alternative results, the model described above was applied to the 2011- 2013 trips landing red hake. The model assumed that no additional trips would be made to mitigate the effects of the lower possession limit and that the timing of those trips would not change in response to the proposed regulations.

Trips that target silver hake sometimes land quantities of red hake that exceed the proposed possession limits but are unlikely to stop fishing and may not be likely to change fishing behavior when the red hake catches exceed a possession limit. Primarily due to the correction in the AM trigger, the 400 lbs. incidental red hake possession limit would be postponed by about three weeks (from approximately

August 5 to August 26). Figure 12 shows the projected pattern of cumulative catch and revenue from northern red hake landings. Landings would be reduced on 54 trips and catch on trips that target or partially target red hake would be reduced on 21 of those 54 trips.

As for the No Action alternative, the results are sensitive to the discard rate, which varies from year to year. Applying the model to 2013 trips and discard rate estimate, the red hake catch estimate is 113% of the ACL (Table 8). This result is a 1.4% increase in red hake catch relative to No Action (Section 7.1.2.3). Revenue from landings would however decline by 3.0% relative to No Action, because the lower possession limits would decrease the proportion of catch landed. Using a different scenario where the discard rate reverts to the mean of 60.6%, the model using 2013 fishery data estimates that northern red hake catches would increase by 1.4% (the same as the result above), but that the total catch would be 91% of the proposed ACL.

Table 19. Expected northern red hake catch as a proportion of the proposed 2015-2017 ACL when applied to reported fishing activity during the 2011-2013 fishing years. The applied possession limit is 3,000 lbs. until landings reach 45% of the TAL, then 1,500 lbs. until landings reach 62.5% of the TAL, the possession limit then drops to 400 lbs.

Fishery application	FY week AM triggered	Catch (% 0f 2015 ACL)	Landed value $	Change Relative to No Action	
				Catch	Revenue
FY2011 (60.6%)	26-Aug	114%	$ 1,917,042	0.4%	0.0%
FY2012 (60.6%)	26-Aug	89%	$ 1,982,852	0.1%	0.0%
FY2013 (60.6%)	19-Aug	91%	$ 1,768,499	1.4%	0.0%
FY2011 (41.7%)	26-Aug	77%	$ 1,893,652	0.4%	0.0%
FY2012 (73.0%)	26-Aug	130%	$ 1,987,807	0.1%	0.0%
FY2013 (68.2%)	19-Aug	113%	$ 1,717,185	1.4%	-3.0%

Although the expected level of catch and landings in comparison with the ACL differs according to which fishing year data and discard rate assumption is applied, the results compared to No Action are stable and robust to these fishery and discard assumptions. Compared to No Action, the results are nearly identical whether the actual estimated discard rate is used or whether a three-year average discard rate of 60.6% is applied.

Using 2011 fishery data and estimated discards, the expected catch is 77% of the ACL, 0.4% higher than that expected with No Action. Landed value of red and silver hake is expected to increase by a small amount. With 2012 data, the expected catch is 130% of the ACL, or 0.1% higher than No Action, while expected revenue declines by a small amount. Using 2011 and 2012 data with a mean discard rate of 60.6%, the expected catch is 114% and 89% of the 2015-2017 ACL, respectively.

Thus compared to the No Action alternative, lowering the northern red hake possession limit from 5,000 to 3,000 lbs. and adjusting the AM trigger from 45to 65% of the TAL is expected to increase landings by a small fraction, while red and silver hake revenue is expected to change very little. Depending on the realized discard rate, the catch could be somewhat less than the ACL if the 2015 discard rate is below

64% and is likely to be below the ACL with the AM trigger in place, if the discard rate reverts to the long-term mean (around 60%).

Relative to No Action, this alternative is expected to have a low negative, but insignificant effect on the northern red hake stock because catch would be higher than it is expected to be with the No Action alternative. However, this alternative is expected to successfully constrain catch to within the ABC, provided discards do not increase substantially beyond the average. . It is not expected that this alternative would re-target small-mesh fishing effort to catch southern red hake, but even if it did recent catches are well below the ACL and **it would have a neutral impact on the southern red hake stock**.

The alternative described in Section 5.2.2 (impacts estimated in the following section), which corrects the AM trigger with no change in the northern red hake possession limit, is expected to increase red hake catches slightly. Relative to that alternative, this alternative would have a low positive impact on northern red hake and would have a neutral impact on the southern red hake stock.

7.1.2.2 Adjust the AM trigger to 62.5% while keeping the northern red hake possession limit at 5,000 lbs. (Section 5.2.2)

This alternative would change only the AM trigger to account for a 39 mt underestimate of the 2012-2014 ABC. Taking this underestimate into account, the 2012 catches were only 27.5% over the ACL rather than the 45% that was initially estimated, and the AM trigger should thus be corrected to 62.5%. This alternative is not intended to modify fishing behavior or activity to keep northern red hake catches below the ACL, except as a consequence of traditional fishing activity and circumstances.

As would be anticipated, this alternative would allow marginally higher northern red hake catches and revenue relative to No Action. Applying the model described above to 2013 fishing trips, the expected catch is 115% of the ACL, or 3.3% higher than that expected with No Action (Table 9). Revenue from red and silver hake landings is predicted to decline slightly by 0.1%[14], while the AM trigger is expected to be postponed by about 2-3 weeks compared to No Action. Landings would be reduced on 47 trips, while catch would decline on 16 of those trips. Trips that occurred in 2013 would be affected mainly due to the AM trigger declining from 90% of the TAL in 2013 to 62.5% of the TAL in 2015. Figure 13 shows the projected pattern of cumulative catch and revenue from northern red hake landings.

[14] This decline in revenue results from an earlier AM trigger compared with 2013 status quo when the AM trigger occurred at 90% of the TAL.

Figure 13. Cumulative catch in fishing year 2013 (expressed as a proportion of 2015 ACL) and number of trips affected by a 3,000 lbs. possession limit, decreasing to 1,500 lbs. when landings reach 45% of the TAL, with an AM trigger at 62.5% of the TAL.

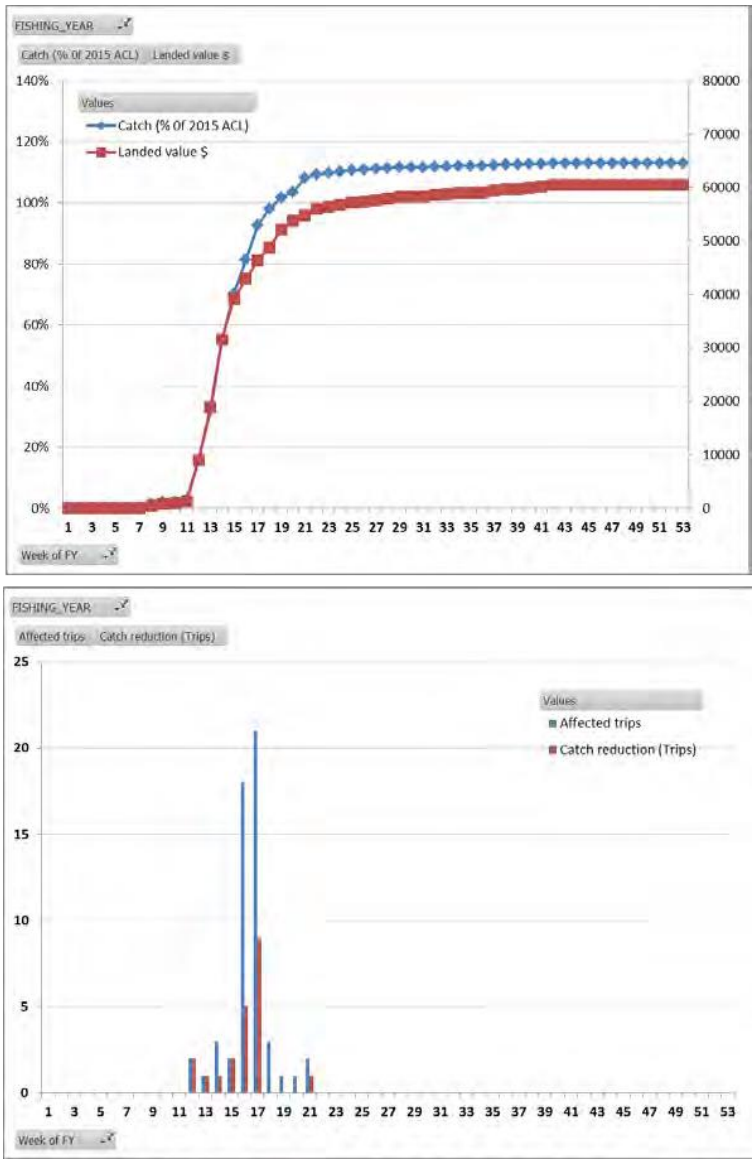


Table 20. Expected northern red hake catch as a proportion of the proposed 2015-2017 ACL when applied to reported fishing activity during the 2011-2013 fishing years. The applied possession limit is 5,000 lbs. until landings reach 62.5% of the TAL.

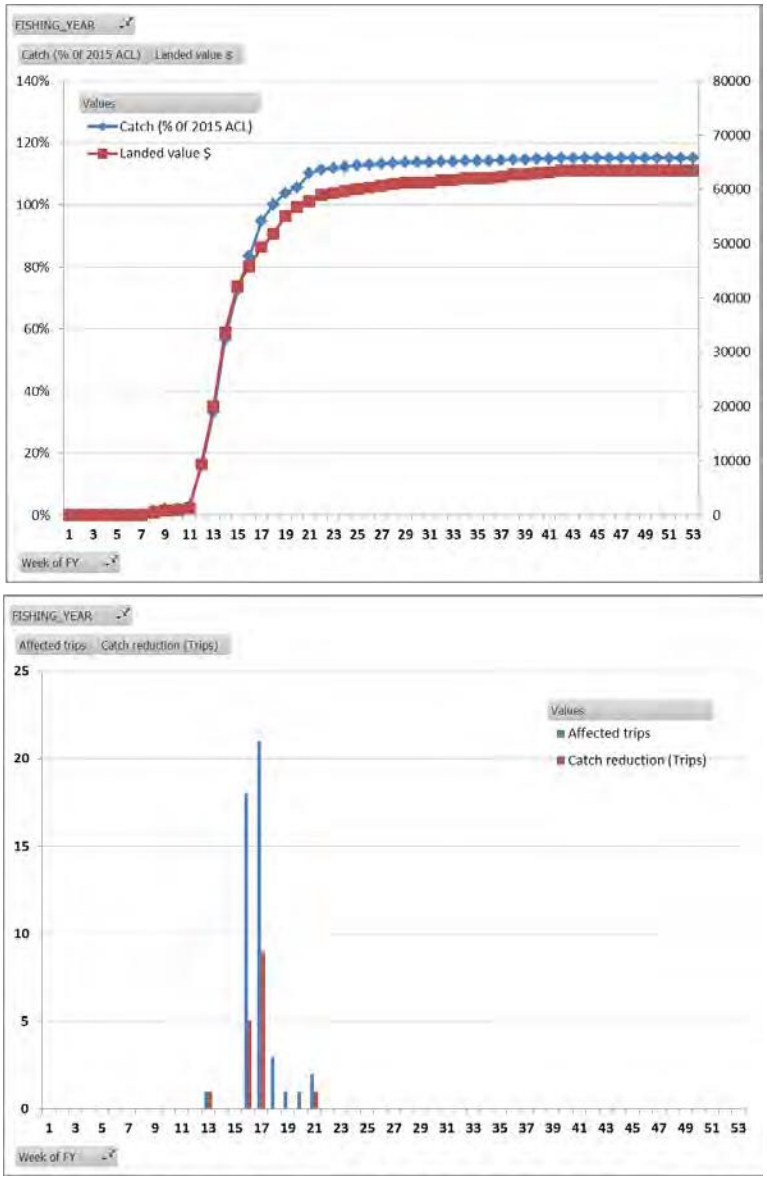
Fishery application	FY week AM triggered	Catch (% 0f 2015 ACL)	Landed value $	Change Relative to No Action	
				Catch	Revenue
FY2011 (60.6%)	26-Aug	115%	$ 1,917,056	0.5%	0.0%
FY2012 (60.6%)	26-Aug	89%	$ 1,982,852	0.1%	0.0%
FY2013 (60.6%)	19-Aug	93%	$ 1,768,394	3.3%	0.0%
FY2011 (41.7%)	26-Aug	77%	$ 1,893,680	0.5%	0.0%
FY2012 (73.0%)	26-Aug	130%	$ 1,987,807	0.1%	0.0%
FY2013 (68.2%)	19-Aug	115%	$ 1,768,911	3.3%	-0.1%

Using 2011 fishery data, northern red hake catch is expected to be 77% of the ACL, or 0.5% higher than with No Action, while revenue from red and silver hake landings would be unchanged. With 2012 fishery data, the expected northern red hake catch is 130% of the ACL, or a 0.1% increase relative to No Action, while revenue from red and silver hake landings would not change.

As with the analysis for the other alternatives, the expected catch is sensitive to the discard rate but the results are robust and stable between alternatives. Using the estimated 2013 discard rate, the catch is expected to be above the 2015-2017 ACL. If the discard rate reverts to the mean, or 60.6%, the expected catch is 89 and 93% of the proposed ACL when the model is applied to 2012 and 2013 fishery data, when the AM trigger was in place. Depending on the realized discard rate, the catch could be somewhat less than the ACL if the 2015 discard rate is below 63% and is likely to be below the ACL with the AM trigger in place, if the discard rate reverts to the long-term mean.

Thus, compared to No Action, it is likely that northern red hake catches would increase and would be slightly more likely to exceed the ACL. Compared to No Action and the other action alternative (impacts described in Section 7.1.2.1), **this alternative would have a low negative, but insignificant impact on the northern red hake stock and neutral impact on the southern red hake stock**.

Figure 14. Cumulative catch in fishing year 2013 (expressed as a proportion of 2015 ACL) and number of trips affected by a 5,000 lbs. possession limit with an AM trigger at 62.5% of the TAL.



7.1.2.3 No Action (Section 5.2.3)

The No Action alternative would retain the 5,000 lbs. red hake possession limit and trigger an incidental 400-lbs. possession limit when northern red hake landings reach 45% of the TAL. In the 2014 fishing year, this accountability measure trigger was reduced from 90% of the TAL to 45% to account for overages of the ACL in 2012, with the intent to reduce the risk of continued overfishing.

Using the analysis described above and the proposed 2015-2017 specifications, the expected catch varies from 77% of the ACL to 130% of the ACL, depending on whether the model is applied to 2011, 2012, or 2013 trips (Table 10). The results are very sensitive to the amount of discarding which is assumed to be around the amounts that occurred in recent years. For the 2013 fishing year, the 400-lbs. was triggered on

August 5th (week 15) and that catches were 13% above the ACL or 8% above the ABC, indicating the overfishing may have been occurring. Figure 14 shows the projected pattern of cumulative catch and revenue from northern red hake landings. If the 2013 fishing activity and pattern persists in 2015, the status quo possession limit and AM would reduce landings on 77 trips and reduce catch on 35 trips.

Table 21. Expected northern red hake catch as a proportion of the proposed 2015-2017 ACL when applied to reported fishing activity during the 2011-2013 fishing years. The applied possession limit is 5,000 lbs. until landings reach 45% of the TAL. The last row represents a sensitivity analysis to identify the maximum discard rate that would keep 2013 catches from exceeding the ACL[15].

Fishery application	FY week AM triggered	Catch (% 0f 2015 ACL)	Landed value $	Change Relative to No Action	
				Catch	Revenue
FY2011 (60.6%)	5-Aug	114%	$ 1,916,984		
FY2012 (60.6%)	12-Aug	89%	$ 1,982,837		
FY2013 (60.6%)	5-Aug	90%	$ 1,768,905		
FY2011 (41.7%)	5-Aug	77%	$ 1,893,466		
FY2012 (73.0%)	12-Aug	130%	$ 1,987,897		
FY2013 (68.2%)	5-Aug	111%	$ 1,771,034		

Because the predicted catch is 11% above the ACL and 6% above the ABC, it indicates that overfishing may continue to occur, although this amount of overage might not cause catch to exceed the OFL. An issue of concern, however, is that the update assessment summarized in the SAFE Report (NEFMC 2014) indicates a high abundance of small red hake that will begin to be selected by commercial fishing gear in 2015. These small red hake are not likely to be marketable and are likely to be discarded. This new recruitment could cause catches to exceed the ACL more than expected by this analysis.

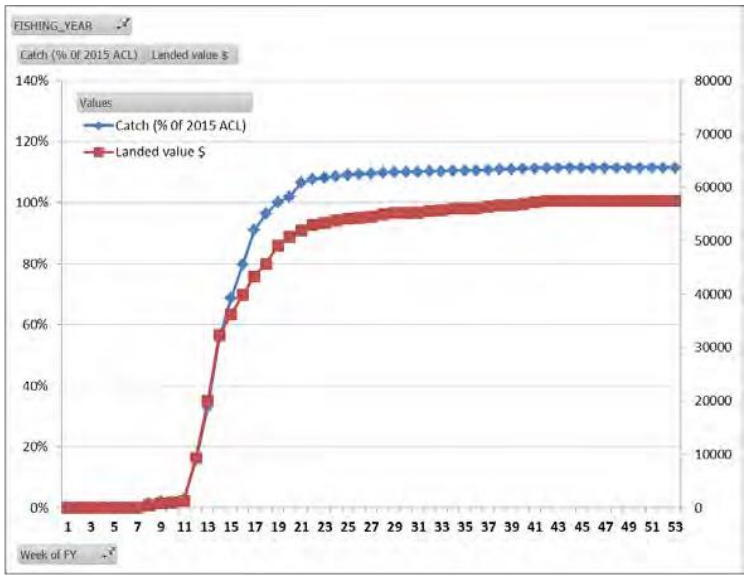
On the other hand, discard behavior has varied in the past 10 years and a small decrease in the discard rate could keep the fishery catches from exceeding the ACL. Such a decline in discards could occur, for example, if there is more demand for red hake and more discarded fish are landed, or the fishery changes in such a way that fishermen more successfully avoid areas where red hake are relatively more abundant. Both responses may produce reasonable changes in the discard rate that would be likely to keep catches below the ACL. If the discard rate declines from 68% to 64%, the model applied to 2013 trips indicates that catches would not exceed the 2015-2017 ACL. Depending on the realized discard rate, the catch could be somewhat less than the ACL if the 2013 discard rate declines below 64% and is likely to be below the ACL with the AM trigger in placed if the discard rate reverts to the long-term mean (60.6%). Applying the 2012 or 2013 fishery data, when the AM trigger was in place, to the model estimates that catches would be 89 and 90% of the proposed ACL.

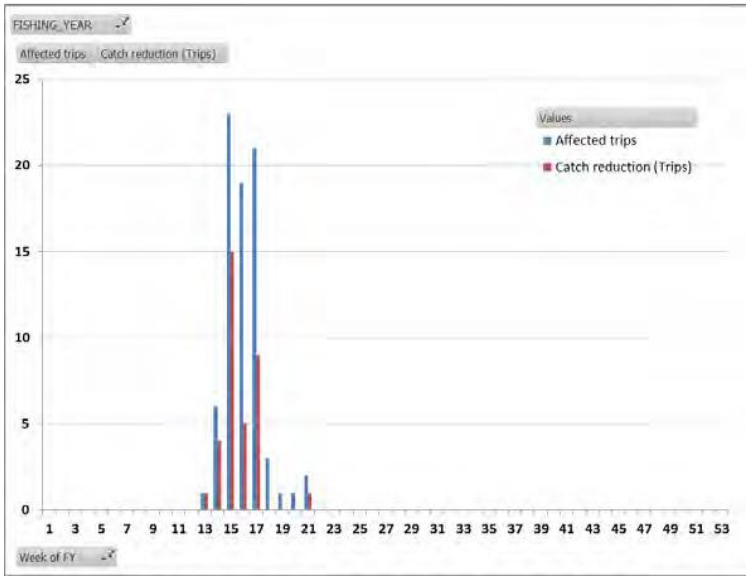
If catches exceed the OFL and overfishing continues, it would be inconsistent with Magnuson-Stevens Act requirements, could decrease future yield from the stock, and fail to produce optimum yield. It is not, however, concluded that No Action would be more likely than not to cause overfishing. **Therefore, when**

[15] The last two columns in this table are blank because it shows the results for No Action, but retains the same formatting as tables showing model results for the action alternatives.

compared to baseline environmental conditions, the No Action would have neutral impact on the northern red hake stock.

Figure 15. Cumulative catch in fishing year 2013 (expressed as a proportion of 2015 ACL) and number of trips affected by a 5,000 lbs. possession limit, decreasing to 400 lbs. when landings reach 45% of the TAL.





7.2 Silver and Offshore Hake Stocks

7.2.1 ACL Specifications

7.2.1.1 Updated specifications (Section 5.1.1; preferred)

The proposed 2015-2017 silver hake ACL specifications (Table 11) range from a substantial increase for the northern stock to a minor relatively minor decrease for the southern stock (Table 11). The proposed specifications are commensurate with stock size and catches in both stock areas have been well below the catch limits since 2012. In the northern stock area (Map 1), the fishery is highly restricted.

Fishing with small-mesh trawls is allowed via exemptions from large-mesh groundfish regulations, which restricts fishing to six specific areas and seasons (Table 11 and Map 1). Furthermore, prices for red and silver hake are heavily influenced by foreign demand and profits after deducting shipping costs to the NY fish markets restrict profits. Fishermen are also required to use raised footrope trawls in all but the Cultivator Shoals Area to minimize groundfish bycatch. Successful fishing with this gear requires specialized knowledge that only a few fishermen have mastered and requires additional investment by vessels already rigged to use other types of trawls.

As such, the specifications are expected to result in neutral biological impacts to the northern silver hake stock, when compared to No Action.

In the southern stock area (Map 1), whiting catches have also been well below the ACL, partly due to market demand and partly due to recent vessel overhauls by some of the more active participants in the small-mesh fishery. Although the regulations are not as strict as they are in the northern stock area and do not require vessels to use a raised footrope trawl, the fishery is still specialized and requires special skill to fish in the areas where silver hake are caught, primarily along the shelf edge. Unless market demand and prices dramatically rise, it is unlikely that catches will approach the ACL.

Although whiting catches are not currently constrained by the ACL specifications, the proposed changes reduce the catch limits so that overfishing is less likely to occur compared to No Action.

Since the proposed specifications keep the catch limits consistent with updated assessment of stock biomass and reduce the potential for overfishing by setting appropriate limits, **the proposed specifications are expected to result in a low positive biological impact to the southern stocks of silver and offshore hake** (collectively known as whiting).

Table 22**.** Differences between the proposed ACL specifications and the No Action ACL specifications**.**

Stock		2012-2014 Specifications (mt)	2015-2017 Specifications (mt)	Percent Change
Northern Silver Hake	ABC	13,777	24,383	+85%
	ACL	12,518	23,161	+85%
	TAL	8,973	19,948.1	+122.3%
Southern Whiting	ABC	33,940	31,180	-8.2%
	ACL	32,243	29,621	-8.2%
	TAL	27,255	23,833.4	-12.6%

7.2.1.2 No Action (Section 5.1.2)

For the northern area, the No Action specifications are lower than the proposed 2015-2017 specifications (Table 11). These specifications would be more restrictive than otherwise necessary, but are still within catch limits based on the best available science. For that reason, **the No Action specifications, given the current status of the stock, are expected to result in neutral biological impacts**.

For the southern whiting stocks, the No Action specifications (Table 11) are higher than the most recent recommendation from the SSC. These specifications are, therefore, higher than is sustainable for these stocks and are inconsistent with the requirements of the FMP and the Magnuson-Stevens Act. However, catches in the southern area are well below both the proposed and No Action specifications and are not expected to increase to the level of the No Action specifications in the coming years. The southern silver hake stock is not overfished, or experiencing overfishing. Therefore, the **No Action specifications are expected to result in low negative to neutral biological impacts** on the southern stocks of whiting.

7.2.2 Northern red hake possession limits

7.2.2.1 3000 lbs. Ppossession limit / 1500 lbs. possession limit; Correction to accountability measure trigger (Section 5.2.1)

The intent of this alternative is to reduce the incentive to target red hake in the northern management area and therefore reduce the potential that catches exceed the red hake ACL. It also corrects for a 39 mt ABC underestimate for 2012-2014. Due to the proposed lower possession limits, some vessels may instead use these trips to target silver hake instead, but this redirection of effort (in time and/or space) is unlikely to increase silver hake catches very much and certainly would not be expected to cause the silver hake catch to exceed the ACL. **Thus, the biological impact on northern silver hake is expected to be low negative and insignificant when compared to No Action, and vice versa.**

Red hake landings from the Cultivator Shoals Area are a small fraction of total small-mesh landings from the area, where trips normally target silver hake and squid (Map 1). It is very unlikely that trips would redirect effort to the southern stock area due to reduce northern red hake possession limits. **Thus, when compared to No Action, the biological impacts on the southern whiting stocks is expected to be neutral.**

7.2.2.2 Correction to Accountability Measure Trigger (Section 5.2.2)

The measure in this alternative would delay the implementation of the in-season AM trigger, while the 5,000 lbs. red hake possession limit would be unchanged. The effect of this measure is that vessels may be able to take a few more trips targeting red hake and land more red hake that occur on trips targeting silver hake. Although unlikely, this alternative may reduce the number of trips targeting silver hake or reduce fishing effort in areas that have more silver hake and fewer red hake. **Thus, compared to No Action (Section 5.2.3), this alternative would have a low positive impact on the northern silver hake stock. Since the alternative would maintain the 5,000 lbs. possession limit while increasing the AM trigger, it would allow vessels longer to target and land red hake without the offsetting effect of the lower red hake possession limit. Thus, compared to the alternative in Section 5.2.1, this alternative would have a low positive effect on the northern silver hake stock.**

It is unlikely that this measure would cause vessels to change the number of small-mesh trips in the southern stock area. **Thus, compared to No Action (Section 5.2.3), this alternative is expected to have a neutral biological impact on southern whiting stocks.**

7.2.2.3 No Action (Section 5.2.3)

No action would retain the existing northern red hake AM trigger at 45% of the TAL and the 5,000 lbs. possession limit. These measures are intended to reduce the risk that catches would exceed the red hake ACL and cause overfishing. It may cause vessel to target northern silver hake more intensely when landings reach the AM trigger and the possession limit goes to 400 lbs., but it is not expected that this would cause northern silver hake or southern whiting catches to come anywhere close to their ACL. **Thus, when compared to baseline environmental conditions, this alternative is expected to have a neutral biological impact on silver and offshore hake stocks.**

7.3 Non-Target Species and Bycatch

7.3.1 ACL Specifications (Section 5.1)

The proposed changes to ACL specifications are not expected to change the distribution and timing of small-mesh fishing effort. Some increase in trips targeting northern silver hake and southern whiting is expected however, particularly due to increasingly restrictive large-mesh groundfish regulations and due to reactivation of some small-mesh fishery vessels that have undergone recent overhauls. Neither the proposed or No Action specifications are expected to make a meaningful difference in this regard, however, but place an upper limit on the amount of small-mesh fishing that could occur.

Thus, compared to No Action (Section 5.1.2), the proposed 2015-2017 specifications are expected to have a neutral biological impact on non-target species and bycatch.

No Action is expected to have a positive, but insignificant biological impact on species commonly caught in the small-mesh fishery (see Section 6.3), compared to baseline environmental conditions. Catch limits coupled with exemption area boundaries and seasons and specific gear requirements such as the raised footrope trawl are intended to keep bycatch at acceptably low levels.

7.3.2 Northern red hake possession limits (Section 5.2)

Reductions in red hake possession limits (Section 5.2.1; preferred) could reduce fishing effort targeting red hake and slightly increase fishing effort in areas where red hake are less abundant. Conversely, a higher AM trigger (Sections 5.2.1and 5.2.2) could have the opposite effect. Since red hake tend to inhabit muddier sea beds than silver hake, less fishing targeting red hake would likewise reduce catches of species that are caught by small-mesh trawls and co-occur on softer, muddier substrate sea beds. These species include monkfish, haddock, and redfish. Any redirection of fishing effort where red hake are less abundant and silver hake are abundant could slightly increase bycatch of species that inhabit sandier, less muddy bottoms. These species include skates, summer flounder, yellowtail flounder, American plaice, and cod.

Thus, compared to No Action (Section 5.2.3), the lower red hake possession limits (Section 5.2.1) are expected to have low positive, but insignificant impacts on species that inhabit muddier, softer sea beds and to have low negative impacts on species that inhabit more sandy bottom where co-occurring with silver hake. Increasing the AM trigger (Section 5.2.2) would allow more fishing for

red hake, it would therefore have the opposite impacts on non-target species and bycatch compared to both No Action and the preferred alternative (Section 5.2.1).

No Action (Section 5.2.3) would retain the 5,000 lbs. red hake possession limit and an AM trigger at 45% of the TAL, having somewhat offsetting effects on fishing effort targeting red hake. **Thus, compared to the alternatives, No Action is expected to have neutral biological impacts on non-target species and bycatch. Since fishing for red hake is limited by these measures, No Action is expected to have a positive, but insignificant biological impact on non-target species and bycatch, compared to baseline environmental conditions.**

7.4 Physical Environment and Essential Fish Habitat

7.4.1 ACL Specifications (Section 5.1)

The proposed specifications (described in Section 5.1.1; preferred) would have neutral impacts on habitat, when compared to the no action alternative.

Except for northern silver hake, the proposed 2015-2017 specifications change the catch limits by a minor amount, ranging from a decrease of 8.2% for southern silver hake to an increase of 2.6% for northern red hake (Table 6). The ACL for northern silver hake is proposed to increase by 85% compared with No Action, but large increases in fishing activity are not expected. Except for northern red hake which would have a relatively low 273 mt ACL, catches and landings are well below existing or proposed limits. As discussed in Section 7.1.1.1, restrictive regulations for small-mesh fishing to keep large-mesh groundfish catches below acceptable levels, limited market demand, and market forces are the primary factors limiting small-mesh fishing. Increases in catch and fishing activity as a result of the proposed changes in specifications are not expected, since the specifications themselves are not the driving factor for changes in effort.

No Action (described in Section 5.1.2), maintaining the existing specifications, is not expected to change fishing effort or behavior, and therefore **is expected to have neutral impacts on habitat**. As described above, the catch limits are not the primary limiting factor in restricting effort in this fishery.

7.4.2 Northern red hake possession limits (Section 5.2)

Compared to No Action, the red hake possession limit alternatives (Section 5.2.1 and 5.2.2) are expected to have neutral impacts on habitat. Similarly, the Section 5.2.1 possession limit would have neutral impacts on habitat compared to the Section 5.2.2 possession limit.

Reductions in red hake possession limits (Section 5.2.1), from 5,000 to a tiered level of 3,000 and 1,500 lbs., are intended to reduce the amount of fishing which targets red hake and shift some fishing effort to areas where red hake are less abundant. Conversely, a higher AM trigger (Sections 5.2.1and 5.2.2) would postpone the activation of a 400 lbs. incidental red hake possession limit and could therefore have the opposite effect. Because red hake tend to inhabit muddier sea beds than silver hake, less fishing targeting red hake may slightly increase fishing in sandier, less muddy bottoms. Silver hake are not abundant on hard, structured (and therefore vulnerable) substrates and fishing is unlikely to occur there. Both substrates (muddy versus sandy) where small-mesh fishing generally occurs are roughly equally vulnerable to the adverse effects from fishing so this potential shift in fishing effort is not expected to change effects on EFH and vulnerable substrates.

This expected shift in fishing effort could however have a low positive effect on species with EFH that, like red hake, coincide with muddier substrates. These species include monkfish, haddock, and redfish. Any redirection of fishing effort where red hake are less abundant and silver hake are abundant could slightly increase effects on EFH of species that inhabit sandier, less muddy bottoms. These species include skates, summer flounder, yellowtail flounder, American plaice, and cod.

No Action (Section 5.2.3) would retain the 5,000 lbs. red hake possession limit and an AM trigger at 45% of the TAL, having somewhat offsetting effects on fishing effort targeting red hake. **Thus the No Action is expected to have neutral impacts on habitat relative to baseline environmental conditions.**

7.5 Protected Resources

7.5.1 ACL Specifications (Section 5.1)

7.5.1.1 No Action

The No Action maintains existing specifications authorized under Amendment 19 (see section 5.1.2). As a result, fishing behavior (e.g., effort) in the small mesh component of the multispecies fishery is expected to remain the same.

Impacts of the No Action on non-ESA listed species, which consist of species of cetaceans and pinnipeds (marine mammals), are somewhat uncertain, as quantitative analysis has not been performed. However, we have considered, to the best of our ability, available information on marine mammal interactions with commercial fisheries, of which, the multispecies is a component (Waring *et al*. 2014). Aside from harbor porpoise and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself over the last 5 years (Waring *et al*. 2014). Specifically, aside from harbor porpoise and several stocks of bottlenose dolphin, potential biological removal (PBR) has not been exceeded for any of the non-ESA listed marine mammal species identified in section 6.5 (Waring *et al*. 2014). Although harbor porpoise and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR, take reduction plans have been implemented to reduce bycatch in the fisheries affecting these species (Harbor Porpoise Take Reduction Plan (HPTRP), effective January 1, 1999 (63 FR 71041); Bottlenose Dolphin Take Reduction Plan (BDTRP), effective April 26, 2006 (71 FR 24776)). These plans are still in place and are continuing to assist in decreasing bycatch levels for these species. Although the information presented is a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and does not address the effects of the multispecies fisheries or its small-mesh component specifically, the information does demonstrate that changes in allocations in the multispecies, or any other fisheries, whether higher or lower, has not resulted in a collective level of take that threatens the continued existence of non-ESA listed marine mammal populations. Based on this information, and the fact that there is continual monitoring of non-ESA listed marine mammal species bycatch, and that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Team), it is not expected that the proposed specifications under the No Action will result in levels of take that will affect the continued existence of non- ESA listed species of marine mammals. For these reasons, the No Action is expected to have neutral impacts on non- ESA listed species of marine mammals.

Similar to non-ESA listed species, impacts to ESA listed species from the No Action are somewhat uncertain, as quantitative analysis has not been performed. However, we have considered, to the best of our ability, how the fishery has operated in regards to listed species from 2013, when major changes to the FMP

had been experienced from the recent implementation of Amendment 19 on May 6, 2013 (78 FR 20260, April 4, 2013), to the present. During this time, NMFS issued a biological opinion on the operation of seven commercial fisheries, including the multispecies fishery and its associated components (NMFS 2013). The Opinion issued on December 16, 2013, included an incidental take statement authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon. The multispecies fishery is currently covered by the incidental take statement authorized in NMFS 2013 Opinion.

The 2013 biological opinion concluded that the fishery may affect, but would not jeopardize the continued existence of any ESA listed species.With the adoption of Amendment 19, specifications for the small mesh component of the multispecies fishery were implemented for fishing years 2012-2014. The No Action will retain the specifications authorized under Amendment 19 and therefore, specifications will be no greater than those that have been previously authorized for the fishery over the last 3 years. As a result, changes in fishing effort or behavior are not expected. As previously authorized specifications for the small mesh component of the multispecies fishery have not resulted in the exceedance of NMFS authorized take of any ESA listed species from 2013 to the present, the specifications for the fishery under No Action are not expected to result in the small mesh component of the multispecies fishery introducing any new risks or additional takes to ESA listed species that have not already been considered and authorized by NMFS to date (NMFS 2013). As a result, the specifications under the "No Action" are not, as concluded in the NMFS 2013 Opinion, expected to result in levels of take that would jeopardize the continued existence of ESA listed species. For these reasons, the No Action would likely have neutral impacts on protected resources.

7.5.1.2 Preferred Alternative

As stated above in section 7.4.1, except for northern silver hake, the proposed 2015-2017 specifications change the catch limits by a minor amount, ranging from a decrease of 8.2% for southern silver hake to an increase of 2.6% for northern red hake (Table 6) and therefore, are within the range of specifications authorized previously for these species. In regards to northern silver hake, the ACL is proposed to increase by 85% compared with No Action; however, large increases in effort are not expected because the specifications themselves are not the driving factor in fishing behavior. As discussed in Section 7.1.1.1, restrictive regulations for small-mesh fishing to keep large-mesh groundfish catches below acceptable levels, limited market demand, and market forces are the primary factors limiting small-mesh fishing. In addition, total catch for northern silver hake has remained relatively stable over the last 10 years. Based on this information, any changes in fishing behavior for any of the stocks regulated under the small mesh component of the multispecies fishery will be minimal to none.

Although the proposed specifications are expected to result in minimal to no increase in effort, if any effort does increase for a particular stock as a result of the proposed specifications, there is the potential for interactions with protected resources to also increase. However, as fishing behavior will be confined to areas that: 1) are already subject to fishing by bottom trawls in the GOM, GB, and SNE and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species (ESA and non-ESA listed species), and 2) have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014), we do not expect any changes in effort to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014). For these, and the reasons stated above, the proposed specifications are likely to have low negative to neutral impacts to protected species.

When compared to the No Action, the proposed specifications may result in low negative impacts to protected species as there is a chance that the proposed specifications, which are higher than those in the No Action, will increase effort, and therefore, increase the potential for an interaction with a protected species.

7.5.2 Northern red hake possession limits (Section 5.2)

7.5.2.1 No Action

The No Action would make no changes to the in-season AM trigger or the northern red hake possession limit. As a result, fishing behavior would remain the same as it has in previous years (i.e., since implementation of Amendment 19 in 2013) and therefore, will remain confined to areas that: 1) are already subject to fishing by bottom trawls in the GOM, GB, and SNE and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species (ESA and non-ESA listed species), and 2) that have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014). Based on this information, we do not expect the No Action to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014). For these, the No Action is likely to have neutral impacts to protected species.

7.5.2.1 Alternatives 5.2.1(3,000 lb Possession Limit)/1500lbs Possession Limit; Correction to AM trigger) and 5.2.2 (Correction to AM Trigger)

Alternatives described in Sections 5.2.1and 5.2.2 would change the northern red hake possession limit and/or the AM trigger. Subtle changes in fishing effort is intended that on one hand would decrease trips targeting red hake and/or postpone the activation of a 400 lbs. northern red hake possession limit (in season AM). Since a substantial majority of the fishery targets silver hake, and fishing is confined to specific exemption areas and seasons (Table 2 and Map 1), changes in small-mesh fishing effort are expected to be very subtle and limited as a result of these alternatives.

As the proposed alternatives are expected to cause minimal changes in fishing effort (e.g., potential decrease in trips targeting red fish), increased interactions with protected resources are not expected. Further, as fishing behavior will still remain confined to areas that: 1) are already subject to fishing by bottom trawls in the GOM, GB, and SNE and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species (ESA and non-ESA listed species), and 2) have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014), the proposed alternatives are not expected to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014). For these reasons, the proposed alternatives, similar to the No Action, are likely to result in neutral impacts to protected species.

7.6 Fishery-Related Businesses and Communities

7.6.1 ACL Specifications (Section 5.1)

This alternative would revise the ACL specifications for northern and southern stocks of silver and red hakes based on updated stock assessments. Table 4 shows the proposed specifications for 2015-2017 fishing years.

The proposed specifications described in Section 5.1.1 would increase the northern red and silver hake TALs but reduce the TALs of the southern red and silver stocks. The table below compares red and silver hake landings and revenues to 2013 TALs and the proposed TALs in this alternative.

Landings of southern red hake both stocks of silver hake were well below the 2013 TALs and the proposed 2015-2017 TALs. Therefore, the proposed limits would not be binding on the fishery and **compared to No Action the impact on revenues would be neutral**. In 2013, landings of northern red hake exceeded the TAL and also exceed the proposed 2015-2017 TAL. Thus, if the fishery stays under the TAL to prevent overfishing, **the impacts on revenue from northern red hake landings would be low negative and insignificant when compared with status quo. The northern red hake TAL for the No Action alternative is actually 15% lower than the proposed TAL and thus the impact of the proposed specifications compared to No Action would be low positive but insignificant.**

Over the long-term, however, the limits are intended to reduce the risk of overfishing to maintain a healthy, sustainable stock which would in turn maximize revenues. Thus, **the No Action alternative (Section 5.1.2) would have positive, but insignificant impacts compared to baseline environmental conditions.**

Table 23. Landings and revenues of small-mesh multispecies stocks in fishing year 2013 compared to Total Annual Landings (TAL) limits for 2013 and those proposed for 2015-2017. Landings were calculated from the 2013 VTRs. Revenues were obtained by multiplying landings with the monthly prices derived from dealer reports. Whiting represent the combined landings of silver and offshore hakes.

Stock	Landings (mt)	Revenues	2013 TAL (mt)	Proposed annual TAL (mt)	Percent change
Northern silver hake	1.322	$1.604.873	8.973	19.947	+122%
Northern red hake	105	$72,456	90.3	104.2	+15%
Southern whiting	4,951	$7,192,444	27,255	23,833	-13%
Southern red hake	499	$474,347	1,336	1,309	-2%

7.6.2 Northern red hake possession limits (Section 5.2)

Northern red hake landings and estimated revenues during the 2011-2013 fishing years are summarized in Table 13. Compared to 2011, landings declined to 97 mt with an estimated value of $72,456. Landings and revenue increased in 2013 to 124 mt worth $148,783.

During 2013 fishing year, total red hake catches in the northern area exceeded the TAL trigger and ABC, thus the in-season AM was triggered to reduce over fishing. In 2014, the post-season AM trigger was implemented to reduce the 400-lb possession limit trigger from 90% to 45% of the TAL to account for prior overages and reduce the risk of future overfishing.

The 2015-2017 proposed alternatives are intended to reduce the risk of continued overfishing as well as account for the miscalculation of the 2011-2013 ABC specifications as discussed earlier in Section 5.2. A summary of the possession limit model results (described in Section 7.1.2) is given in Table 14. For this analysis, the potential economic impacts of the proposed alternatives are compared against the landing and revenues from 2013 fishing year (status quo), as we are currently in the middle of 2014 fishing year and these values for 2014 are not yet available.

Although, the model indicates that there will be a decline in northern red hake revenues, it is not expected to have a large impact on the overall revenues of these vessels. In fishing year 2013, there were 42 vessels that landed red hake on 471 trips in the northern area. On average, their northern red hake revenues were 2% of the total revenues from all fishing activities. Moreover, the proposed regulations are intended to reduce targeted red hake trips. Based on 2013 data, there were only eight targeted trips where red hake landings were more than 50% of the trip's total landings. Most trips (78%) had red hake landings which were less than 25% of the trip's total landings. Since most trips landing red hake in the northern area were not entirely dependent on red hake, the proposed regulations may encourage modification in fishing behavior and help mitigate some of the negative impacts. Impacts of each proposed alternative are discussed in the following sections.

Table 24. Northern red hake landings and estimated revenues. Revenues were estimated by applying the monthly dockside prices reported by dealers to the landings reported on vessel trip reports.

Fishing Year	Landings (mt)	Revenues
2011	124	$148,783
2012	97	$69,886
2013	105	$72,456

Table 25. Potential economic impacts of the proposed alternatives.

Proposed alternative	Estimated landings (mt)	Trips with catch reduction	Estimated revenues	Trips with revenue reduction
Section 5.2.1	98.1	21	$60.514	54
Section 5.2.2	99.9	16	$63,493	47
Section 5.2.3 (No action)	96.7	35	$57,483	77

7.6.2.1 Reduced northern red hake possession limit and correct AM trigger (Section 5.2.1; preferred)

Under this alternative the fishing season would start with a 3,000-lbs. northern red hake possession limit, but decline to 1500 lbs. when landings reach 45% of the TAL. The in-season AM would be triggered when the landings reach 62.5% of the TAL, reducing the possession limit to 400 lbs. With these proposed limits, based on the model results presented in Section 7.1.2, revenues are estimated to decline by 16% to $60,514 (Tab). The model assumes the number of trips will remain the same; however revenues will decline in 54 trips. The model also assumes that trips targeting red hake will stop fishing when landings exceed the possession limit. In 2013, there were 8 targeted trips taken by 4 vessels. These vessels may potentially be impacted more by this lower possession limit than the other proposed alternatives. In the long run, the vessels are expected to modify their fishing behavior and compensate this loss in revenue.

Compared to No Action (Section 5.2.3), landings are expected to increase by 1.4% and revenue would increase by 5%, thus having low positive, but insignificant impacts. Compared to the impacts of alternative 5.2.2, the decline revenue from status quo is slightly more because of the

lower possession limit would imposed for the entire year. Thus compared to the alternative in Section 5.2.2, the economic impacts are expected to be low negative but insignificant.

7.6.2.2 Adjust the AM trigger to 62.5% while keeping the northern red hake possession limit at 5,000 lbs. (Section 5.2.2)

This alternative would keep the current possession limit at 5,000 lbs., but the in-season AM would be triggered at 62.5% of the TAL. Under this alternative, the expected revenues from northern red hake landings would be $63,493 (Table 14). Compared to 2013 (status quo), landings would decline by 5% and revenues by 12%. The revenues are expected to decline in 47 trips. This result is not surprising because this regulation would be more restrictive than the regulations that were in effect during fishing year 2013 where the possession limit was 5000 lbs. and the in-season AM was triggered when landings reached 90% of TAL.

The negative impacts of this alternative are less than the negative impacts of the alternative in Section 5.2.1. This result should be expected because the possession limit is higher under this alternative allowing more trips to retain their landings from the beginning of the season.

Compared to No Action, this alternative would increase landing by 3% and revenues by 10% and thus be expected to have a low positive, but insignificant impact, since this alternative proposes increasing the percentage at which AM would be triggered.

7.6.2.3 No Action (Section 5.2.3)

This action would keep the possession limit at 5,000 lbs. and the in-season AM would be triggered when landing reach 45% of the TAL. Compared to 2013 (status quo, when the AM trigger was set at 90% of the TAL), the estimated landings are 9% (96.7 mt) lower and revenues are21% ($57,483) lower than status quo (Table 14). **Since No action reduced the AM trigger from 90% of TAL in 2013 to 45% TAL in 2014, the impact is expected to be low negative and insignificant when compared to baseline environmental conditions**.

Results show a decline in landing and revenues under both the alternatives described in Sections 5.2.1 and 5.2.2 but these impacts are less than the impacts under the "No action" alternative. This is because **No action is more restrictive than these two alternative actions, and would have more negative impacts than either of the proposed alternatives**. However, the impacts would not be significant.

7.7 Cumulative Effects Analysis

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an EA under NEPA as long as the significance of cumulative impacts have been considered (U.S. EPA 1999). The following remarks address the significance of the expected cumulative impacts as they relate to the federally-managed small-mesh multispecies fishery.

7.7.1 Consideration of VECs

In Section 6.0 (Affected Environment), the VECs that exist within the small-mesh multispecies fishery environment are identified. Therefore, the significance of the cumulative effects will be discussed in relation to the VECs listed below.

1. Red, Silver, and Offshore Hake Stocks
2. Non-target species and Bycatch
3. Physical Environment and Essential Fish Habitat
4. Protected Resources
5. Fishery-related businesses and communities

7.7.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the small-mesh multispecies fishery, which targets red, silver, and offshore hakes. The core geographic scope for each of the VECs is focused on the Western Atlantic Ocean (Sections 6.1and 6.2). The core geographic scopes for the managed resources are the range of the management units (Section 6.1and 6.2). For non-target species, those ranges may be expanded and would depend on the biological range of each individual non-target species in the Western Atlantic Ocean. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by red, silver, and offshore hakes and other non-target species in the Western Atlantic Ocean. The core geographic scope for protected resources can be considered the overall range of these VECs in the Western Atlantic Ocean. For fishery-related businesses and communities, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest or processing of the managed resources, which were found to occur in coastal states from Maine through North Carolina (Section 6.6).

7.7.3 Temporal Boundaries

The temporal scope of past and present actions for VECs is primarily focused on actions that have occurred after FMP implementation (Section 4.1). For endangered and other protected resources, the scope of past and present actions is on a species-by-species basis (Section 6.3) and is largely focused on the 1980s and 1990s through the present, when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all five VECs extends to the end of the 2017 fishing year, when specifications would be re-evaluated. This period was chosen because it is the effective length of the action, and because the dynamic nature of resource management for these three species and lack of information on projects that may occur in the future make it very difficult to predict impacts beyond this timeframe with any certainty.

7.7.4 Actions Other Than Those Proposed in this Document

The impacts of each of the alternatives considered in this specifications document are given in Section 7.1 through 7.4. Table 26 presents meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions to be considered other than those actions being considered in this specifications document. These impacts are described in chronological order and qualitatively, as the actual impacts of these actions are too complex to be quantified in a meaningful way. When any of these abbreviations occur together (i.e., P, Pr, RFF), it indicates that some past actions are still relevant to the present and/or future actions.

Table 26. Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Red, Silver, and Offshore Hakes Stocks	Impacts on Non-target Species and Bycatch	Impacts on the Physical Environment and EFH	Impacts on Protected Species	Impacts on Fishery-related Businesses and Communities
P, Pr Original FMP and subsequent Amendments and Frameworks to the FMP	Established commercial fishery management measures	**Indirect Positive** Regulatory tool available to rebuild and manage stocks	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses
P, Pr Summer Flounder, Scup, and Black Sea Bass Specifications	Establish quotas, RHLs, other fishery regulations (commercial and recreational)	**Indirect Positive** Regulatory tool to specify catch limits, and other regulation; allows response to annual stock updates	**Indirect Positive** Reduced effort levels; gear requirements	**Indirect Positive** Reduced effort levels; gear requirements	**Indirect Positive** Reduced effort levels; gear requirements	**Indirect Positive** Benefited domestic businesses
P, Pr, RFF Development, Application, and Revision of Standardized Bycatch Reporting Methodology	Established acceptable level of precision and accuracy for monitoring of bycatch in fisheries	**Neutral** May improve data quality for monitoring total removals of managed resource	**Neutral** May improve data quality for monitoring removals of non-target species	**Neutral** Will not affect distribution of effort	**Neutral** May increase observer coverage and will not affect distribution of effort	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
Pr, RFF Omnibus Amendment ACLs/AMs Implemented	Establish and apply ACLs and AMs for all three plan species	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis

Action	Description	Impacts on Red, Silver, and Offshore Hakes Stocks	Impacts on Non-target Species and Bycatch	Impacts on the Physical Environment and EFH	Impacts on Protected Species	Impacts on Fishery-related Businesses and Communities
RFF Limited Access Amendment	Establish qualifications for vessels to participate in the small-mesh fishery; establish additional limits for incidental catch for non-qualifying vessels	**Direct Positive** Pending full analysis	**Potentially Direct Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Direct Positive** Pending full analysis
P, Pr, RFF Agricultural runoff	Nutrients applied to agricultural land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource
P, Pr, RFF Port maintenance	Dredging of coastal, port and harbor areas for port maintenance	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
P, Pr, RFF Beach nourishment	Offshore mining of sand for beaches Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality **Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality **Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality **Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality **Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for mining companies, possibly negative for fishing industry **Positive** Beachgoers like sand; positive for tourism
P, Pr, RFF Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for some interests, potential displacement for others

Action	Description	Impacts on Red, Silver, and Offshore Hakes Stocks	Impacts on Non-target Species and Bycatch	Impacts on the Physical Environment and EFH	Impacts on Protected Species	Impacts on Fishery-related Businesses and Communities
P, Pr, RFF Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Reduced habitat quality	**Potentially Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
P, Pr, RFF Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource viability
RFF Offshore Wind Energy Facilities (within 3 years)	Construction of wind turbines to harness electrical power (Several proposed from ME through NC, including NY/NJ, DE, and VA)	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
Pr, RFF Liquefied Natural Gas (LNG) terminals (within 3 years)	Transport natural gas via tanker to terminals offshore and onshore (1 terminal built in MA; 1 under construction; proposed in RI, NY, NJ and DE)	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
RFF Convening of Gear Take Reduction Teams (within next 3 years)	Recommend measures to reduce mortality and injury to marine mammals	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues

7.7.4.1 Past and Present Actions

The historical management practices of the Council have resulted in positive impacts on the health of the red, silver, and offshore hakes stocks (Sections 6.1 and 6.2). Numerous actions have been taken to manage the commercial and recreational fisheries for these three species through amendment and framework adjustment actions. In addition, the specifications process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fishery and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the FMP and the targets associated with any rebuilding programs under the FMP. The statutory basis for Federal fisheries management is the MSA. To the degree with which this regulatory regime is complied, the cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the VECs should generally be associated with positive long-term outcomes. Constraining fishing effort through regulatory actions can often have negative short-term socioeconomic impacts. These impacts are usually necessary to bring about long-term sustainability of a given resource, and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the small-mesh multispecies and other related fisheries that have incidental catches of red, silver, and offshore hakes.

Non-fishing activities were considered when determining the combined effects from past, present, and reasonably foreseeable future actions. Each activity that has been considered as part of this cumulative impact analysis is weighted the same as any other. We lack the resources to quantify whether any one non-fishing activity would result in greater impacts to a particular VEC versus any other (this includes global climate change). Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all of the identified VECs. Human-induced non-fishing activities tend to be localized in near-shore areas and marine project areas where they occur. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. The overall impact to the affected species and their habitats on a population level is unknown, but likely neutral to low negative, since a large portion of these species have a limited or minor exposure to these local non-fishing perturbations.

In addition to guidelines mandated by the MSA, NMFS reviews these types of effects through the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by federal, state, and local authorities. The jurisdiction of these activities is in "waters of the U.S." and includes both riverine and marine habitats.

7.7.4.2 Global climate change

U.S. average temperature has increased by about 1.5°F since 1895; more than 80% of this increase has occurred since 1980. The most recent decade was the nation's hottest on record. U.S. temperatures will continue to rise, with the next few decades projected to see another 2°F to 4°F of warming in most areas. The amount of warming by the end of the century is projected to correspond closely to the cumulative global emissions of greenhouse gases up to that time; between 3°F to 10°F depending on whether emissions are drastically reduced (NCADAC draft report 2013). Global climate change already has had

observable effects: glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted poleward or upslope, and animals and plants are reproducing sooner in the spring or later in the fall.

Global climate change will affect all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition, changes in water circulation, increased frequency, intensity and duration of extreme climate events, changing water chemistry and increasing acidity, and warming ocean temperatures. Emerging evidence demonstrates that these physical changes are resulting in direct and indirect ecological responses within marine ecosystems which may alter the fundamental production characteristics of marine systems (Stenseth et. al. 2002). Climate change will potentially exacerbate the stresses imposed by harvesting (fishing) and other non-fishing human activities and stressors (described in this section). Potential mitigation and adaptation strategies to climate change are unknown as the science surrounding predicting, evaluating, monitoring and categorizing these changes is evolving.

It is not currently feasible to link individual project contribution of greenhouse gas (GHG) emissions to global climate change. Determining significant effects of specific proposals on global climate change cannot be made at any scale given the complex nature of climate change. Fisheries and aquaculture activities do make a minor contribution to GHG emissions during harvesting operations, transport, and the processing and storage of fish (FAO intro). When compared to other industries, such as energy production, the contributions by fisheries and aquaculture of GHG is small, if not negligible. Management measures that reinforce efforts to improve sustainability, such as reductions in fishing effort and fleet capacity, would mitigate the carbon emissions contribution of the fishing industry to the global production of GHG. Alternative measures considered that would result in a shift of fishing effort may then increase trip distances and increase GHG emissions.

Some specific impacts of global climate change that have been predicted on each of the VECs for are described in the cumulative impacts analysis, below.

7.7.4.3 Reasonably foreseeable future actions

In fishing year 2012, ACLs and AMs were first implemented for red, silver, and offshore hake stocks (as well as other Council managed species) to ensure that catch and landings limits are not exceeded and overfishing does not occur. Monitoring of catch since 2012 was completed and summarized in NEFMC 2014, indicating that catches of red, silver, and offshore hakes stocks were generally well below the ABCs and overfishing was not occurring. Catches of northern red hake were however 27.5% above the ABC and the in-season AM (a reduction in possession limit to discourage targeting and encourage fishing where red hake are less abundant) was adjusted post hoc to reduce future risk of overfishing. This adjustment applied to the ongoing 2014 fishing year and will continue into the future subject to future revisions, if needed. As a result, the Reasonably Foreseeable Future Actions over the next three years may include this AM and potential implementation or adjustment of accountability measures and other Council recommended adaptive adjustments to the way this new system of catch limits and accountability functions and interacts with the fishery regulations in place.

In 2014, the Council is beginning development of a new amendment to establish limited access qualification criteria for vessels to participate in the small-mesh multispecies fishery. Although the details are to be developed, these criteria will be based on historic participation in the fishery before the 2013 control date. Without taking action, new entrants to the fishery could cause catches to increase and exceed the limits, particularly for “choke” species for which current catches are near or have in the recent past exceeded established limits. Other limits on groundfish catches may also impact the fishery, which

would be exacerbated if the number of vessels in the fishery substantially increases. Because market demand is dominated by external forces, significant increases in red hake and whiting catches could also have negative effects on price, having a negative impact on traditional fishermen and communities.

For many of the proposed non-fishing activities to be permitted under other federal agencies (such as beach nourishment, offshore wind facilities, etc.), those agencies would conduct examinations of potential impacts on the VECs. The MSA (50 CFR §600.930) imposes an obligation on other federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH. The eight Fishery Management Councils are engaged in this review process by making comments and recommendations on any federal or state action that may affect habitat, including EFH, for their managed species and by commenting on actions likely to substantially affect habitat, including EFH.

In addition, under the Fish and Wildlife Coordination Act (Section 662), "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the U.S., or by any public or private agency under federal permit or license, such department or agency first shall consult with the U.S. Fish and Wildlife Service (USFWS), Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the" activity is taking place. This act provides another avenue for review of actions by other federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future.

In addition, NMFS and the USFWS share responsibility for implementing the ESA. ESA requires NMFS to designate "critical habitat" for any species it lists under the ESA (i.e., areas that contain physical or biological features essential to conservation, which may require special management considerations or protection) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS' jurisdiction.

7.7.5 Magnitude and significance of cumulative effects

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and future actions, must be taken into account. The following section discusses the effects of these actions on each of the VECs.

7.7.5.1 Red, silver, and offshore hake stocks

Those past, present, and reasonably foreseeable future actions, whose effects may impact the managed resources and the direction of those potential impacts, are summarized in Table 26. The indirectly negative actions described in this table are localized in near-shore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on the managed resources is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of the managed resources is unquantifiable. As described above (Section 7.7.4.3), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Climate change is already impacting fishery resources by shifting distributions, abundances, and phenology of species and the communities that depend on them. For example, cold water species are shifting northward. Some of these shifts are in response to warming waters and some are in response to changes in population abundance and age-structure. Water temperatures are known to exert significant influence different life stages, on reproductive and developmental processes, growth rates, and increase the likelihood of disease. Shifts in red and silver hake distribution in surveyed areas was evaluated and documented by Nye et al. 2009 and Nye et al. 2011. With shifting species distribution, loss of habitat, and changes in mortality, the ability of some fish stocks to respond to harvesting pressure may be reduced, while the ability of other fish stocks may be increased.

These impacts are expected to intensify in the future, increasing the need for a better understanding of which fishery resources are the most vulnerable. NMFS has developed a tool for rapidly assessing and indexing the vulnerability of fish stocks to climate change. The index can help fishery managers identify high vulnerability stocks and more effectively target limited research and assessment resources on stocks of highest concern. The methodology combines a stock's exposure and sensitivity (which includes adaptive capacity) to estimate overall vulnerability. Pilot tests have found the methodology to be robust across temperate and tropical ecosystems. A full assessment has been developed in the northeast U.S. for all managed fish and shellfish species in the spring of 2014 (Nelson et al. in prep).

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on the managed resources. It is anticipated that the future management actions, described in Table 16, will result in additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which red, silver, and offshore hakes productivity depends. The 2012 fishing year was the first year of implementation for an amendment which requires specification of ACLs/AMs and catch accountability (77 FR 19138 and 78 FR 20260) and this process has been carried forward into the 2015-2017 proposed measures. Implementation of ACLs and AMs represents a major change to the current management program and is expected to lead to improvements in resource sustainability over the long-term. These impacts could be broad in scope, but the impacts were evaluated in the EIS for Amendment 19 (NEFMC 2013). Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to red, silver, and offshore hakes have had a positive cumulative effect.

Catch limits for each of the managed resources have been specified to ensure these stocks are managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from annual specification of management measures established in previous years on the managed resources are largely dependent on how effective those measures were in meeting their intended objectives (i.e., preventing overfishing, achieve OY) and the extent to which mitigating measures were effective. The proposed action in this document would positively reinforce the past and anticipated positive cumulative effects on the red, silver, and offshore hakes stocks, by achieving the objectives specified in the FMP. Therefore, the proposed action would not have any significant effect on the managed resources individually or in conjunction with other anthropogenic activities (see the table below).

Table 27. Summary of the effects of past, present, and reasonably foreseeable future actions on red, silver, and offshore hake stocks.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Direct Positive**	
Red, Silver, and Offshore Hakes Specifications	**Direct Positive**	
Developed, Apply, and Redo Standardized Bycatch Reporting Methodology	**Indirect Neutral**	
Amendment to address ACLs/AMs implemented	**Direct Positive**	
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Indirect Negative**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Indirect Negative**	
Beach nourishment – Sand placement	**Indirect Negative**	
Marine transportation	**Indirect Negative**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative**	
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on red, silver, and offshore hakes stocks**	

7.7.5.2 Non-target species and Bycatch

Those past, present, and reasonably foreseeable future actions, whose effects may impact non-target species and bycatch and the direction of those potential impacts, are summarized in Table 26. The effects of indirectly negative actions described in this table are localized in nears-shore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on non-target species and bycatch is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of non-target resources and the oceanic ecosystem is unquantifiable. As described above (Section 7.7.4.3), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. At this time, NMFS can consider impacts to non-target species and bycatch (federally-managed or otherwise) and comment on potential impacts. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources within NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on non-target species and bycatch. In particular, the small-mesh multispecies fishery is managed through specific exemptions from large-mesh multispecies regulations in such a way to minimize interactions with non-target species and bycatch. Specifically, these regulations include exemption areas and seasons in the northern management area that through prior experimental fishing permits have been shown to have acceptably low bycatch rates of large-mesh groundfish. In the southern management area, vessels may target red, silver, and offshore hakes year round, but operate in areas where large mesh multispecies catches are low. Concern about these species is however changing, particularly for distressed or overfished species like yellowtail and windowpane flounders.

Implementation and application of a standardized bycatch reporting methodology (SBRM) would have a particular impact on non-target species by improving the methods which can be used to assess the magnitude and extent of a potential bycatch problem. The redevelopment of the SBRM will result in better assessment of potential bycatch issues and allow more effective and specific management measures to be developed to address a bycatch problem. On-going research is being conducted through cooperative research and other programs to improve selectivity characteristics of small-mesh nets used by vessels targeting whiting and squids, particularly focused on reducing bycatch of yellowtail and windowpane flounders, species with sub-ACLs and subject to AMs. Use of these gears may be approved as an AM or as a technical measure in future management actions if they are shown to be effective.

It is anticipated that future management actions, described in Table 26, will result in additional indirect positive effects on non-target species through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which the productivity of many of these non-target resources depend. The impacts of these future actions could be broad in scope, and it should be noted the managed resource and non-target species are often coupled in that they utilize similar habitat areas and ecosystem resources on which they depend. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful have had a positive cumulative effect on non-target species.

Catch limits for each of the managed resources have been specified to ensure these rebuilt stocks are managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document have impacts that range from neutral to positive or negative impacts, and would not change the past and anticipated positive cumulative effects on non-target species and thus, would not have any significant effect on these species individually or in conjunction with other anthropogenic activities (see table below).

Table 28. Summary of the effects of past, present, and reasonably foreseeable future actions on the non-target species and bycatch.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Direct Positive**	
Red, Silver, and Offshore Hakes Specifications	**Indirect Positive**	
Developed, Apply, and Redo Standardized Bycatch Reporting Methodology	**Neutral**	
Amendment to address ACLs/AMs implemented	**Potentially Indirect Positive**	
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Indirect Negative**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Indirect Negative**	
Beach nourishment – Sand placement	**Indirect Negative**	
Marine transportation	**Indirect Negative**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative**	
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the non-target species.**	

7.7.5.3 Physical Environment and Essential Fish Habitat

Those past, present, and reasonably foreseeable future actions, whose effects may impact habitat (including EFH) and the direction of those potential impacts, are summarized in Table 26. The direct and indirect negative actions described in this table are localized in near-shore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on habitat is expected to be limited due to a lack of exposure to habitat at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on habitat and EFH is unquantifiable. As described above (Section 7.7.4.3), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources and the habitat on which they rely prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of direct and indirect negative impacts those actions could have on habitat utilized by resources under NMFS' jurisdiction.

Climate change is expected to have an impact on the physical characteristics and essential fish habitat aspects of marine ecosystems, and possibly change the very nature of these ecosystems. Increased frequency and intensity of extreme weather events, like hurricanes, may change the physical structure of coastal areas. Water circulation, currents, and the proportion of source waters/freshwater intrusion have been observed to be changing (Ecosystem Assessment Program, NEFSC, 2012) which influences salinity, water column stratification, transport of nutrients, and food web processes. All of these factors, in addition to others like ocean acidification and changes to water chemistry (Rebuck et al. in prep), threaten living elements of the marine environment, such as corals and shellfish, and may be related to the observed shifts in the planktonic community structure that forms the basis of the marine food web.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on habitat and EFH. The actions have constrained fishing effort at a large scale and locally, and have implemented gear requirements, which may reduce habitat impacts. As required under these FMP actions, EFH and HAPCs were designated for the managed resources. It is anticipated that the future management actions, described in Table 18, will result in additional direct or indirect positive effects on habitat through actions which protect EFH for federally-managed species and protect ecosystem services on which these species' productivity depends. These impacts could be broad in scope. All of the VECs are interrelated; therefore, the linkages among habitat quality and EFH, managed resources and non-target species productivity, and associated fishery yields should be considered. For habitat and EFH, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and it is anticipated will continue to be, taken to improve the condition of habitat. There are some actions, which are beyond the scope of NMFS and Council management such as coastal population growth and climate changes, which may indirectly impact habitat and ecosystem productivity. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to habitat have had a neutral to positive cumulative effect.

Catch limits for each of the managed resources have been specified to ensure that red, silver, and offshore hakes stocks are managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document would not change the past and anticipated cumulative effects on habitat and thus, would not have any significant effect on habitat individually or in conjunction with other anthropogenic activities (see table below).

Table 29. Summary of the effects of past, present, and reasonably foreseeable future actions on the physical environment and EFH.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**	
Red, Silver, and Offshore Hakes Specifications	**Indirect Positive**	
Developed, Apply, and Redo Standardized Bycatch Reporting Methodology	**Neutral**	
Amendment to address ACLs/AMs implemented	**Potentially Indirect Positive**	
Agricultural runoff	**Direct Negative**	
Port maintenance	**Uncertain – Likely Direct Negative**	
Offshore disposal of dredged materials	**Direct Negative**	
Beach nourishment – Offshore mining	**Direct Negative**	
Beach nourishment – Sand placement	**Direct Negative**	
Marine transportation	**Direct Negative**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Direct Negative**	
National Offshore Aquaculture Act of 2007	**Direct Negative**	
Offshore Wind Energy Facilities (within 3 years)		**Potentially Direct Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Potentially Direct Negative**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, direct negative to indirect positive impacts on the physical environment and EFH.**	

7.7.5.4 Protected Resources

Those past, present, and reasonably foreseeable future actions, whose effects may impact the protected resources and the direction of those potential impacts, are summarized in Table 26. The indirectly negative actions described in this table are localized in near-shore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on protected resources, relative to the range of many of the protected resources, is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on protected resources either directly or indirectly is unquantifiable. As described above (Section 7.7.4.3), NMFS has several means, including ESA, under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' protected resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on protected resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on ESA-listed and MMPA protected species through the reduction of fishing effort (potential interactions) and implementation of gear restrictions, open seasons, and exemption areas. It is anticipated that the future management actions, specifically those recommended by the ALWTRT and the development of strategies for sea turtle conservation described in Table 26, will result in additional indirect positive effects on the protected resources. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected resources have had a positive cumulative effect.

Catch limits for each of the managed resources have been specified to ensure that red, silver, and offshore hakes stocks are managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document would not change the past and anticipated cumulative effects on ESA-listed and MMPA protected species and thus, would not have any significant effect on protected resources individually or in conjunction with other anthropogenic activities (Table 26).

For sea turtles, changes to both their marine and terrestrial environment due to climate change pose a challenge. Recent studies suggest that warming temperatures at nesting beaches could have the strongest impacts on sea turtle populations due to reduced nest success and recruitment (Santidrian-Tomillo et al. 2012; Saba et al. 2012). Additionally, increased severity of extreme weather events may create erosion and damage to turtle nest and nesting sites (Goldenberg et al 2001; Webster et al 2005, IPCC 2013), resulting in a further reduction in nest success and recruitment. These potential declines in the success of nesting could have profound effects on the abundance and distribution of sea turtles. Moreover, warming air temperature can also affect the demography of sea turtle populations because the sex ratio of hatchling sea turtles is determined by the temperature during incubation in nesting beaches. Female offspring are produced at warmer temperatures and thus climate change could lead to a lower ratio of males in the population. Changes in water circulation near nesting beaches could affect the early life history stages of sea turtles by transporting passively-drifting hatchlings to waters that may have increased predation rates (Shillinger et al. 2012). Furthermore, prey availability and quality may also be affected by climate change but these projections are far less certain.

Marine mammals are subject to impacts from global climate change through climate variability, water temperature changes, changes to ocean currents, changes in impact primary productivity and prey species availability. For example, shifts in zooplankton patch formation, which have already been observed,

could affect the feeding opportunities and therefore populations of North Atlantic Right Whales (NEQ website). Susceptibility to disease, changes in toxicant exposure, and decreased reproductive success with rising ocean temperatures and related climate-ecosystem changes is also of concern (Burek et. al, 2008). Species that migrate to feeding grounds in polar regions (including many baleen whale populations) may be more susceptible to climate change in the near-term since conditions in the polar regions are changing more rapidly than in temperate regions.

Table 30. Summary of the effects of past, present, and reasonably foreseeable future actions on the protected resources.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**	
Red, Silver, and Offshore Hakes Specifications	**Indirect Positive**	
Developed, Apply, and Redo Standardized Bycatch Reporting Methodology	**Neutral**	
Amendment to address ACLs/AMs implemented	**Potentially Indirect Positive**	
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Indirect Negative**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Indirect Negative**	
Beach nourishment – Sand placement	**Indirect Negative**	
Marine transportation	**Indirect Negative**	
Installation of pipelines, utility lines and cables	**Potentially Direct Negative**	
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on protected resources.**	

7.7.5.5 Fishery-related businesses and communities

Those past, present, and reasonably foreseeable future actions, whose effects may impact human communities and the direction of those potential impacts, are summarized in Table 26. The indirectly negative actions described in this table are localized in near-shore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on human communities is expected to be limited in scope. It may, however, displace fishermen from project areas. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude. This may result in indirect negative impacts on human communities by reducing resource availability; however, this effect is unquantifiable. As described above (Section 7.7.4.3), NMFS has several means under which it can review non-fishing actions of other federal or state agencies prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on human communities.

As both the physical and ecological elements of the coastal and marine environments change through the impacts described in this section, there will be increasing challenges for the communities and individuals that depend on healthy and productive coasts and marine fisheries. The dynamics of certain fisheries may change entirely. Fishing-related businesses and communities also face a variety of other threats from changing climate including to human health concerns, energy, transportation, water resources, and food production.

Past fishery management actions taken through the FMP and annual specification process have had both positive and negative cumulative effects by benefiting domestic fisheries through sustainable fishery management practices, while at the same time potentially reducing the availability of the resource to all participants. Sustainable management practices are, however, expected to yield broad positive impacts to fishermen, their communities, businesses, and the nation as a whole. It is anticipated that the future management actions, described in 26, will result in positive effects for fishing-related businesses and communities due to sustainable management practices, although additional indirect negative effects on the some businesses and communities could occur through management actions that may implement gear requirements or area closures and thus, reduce revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to fishing-related businesses and communities have had an overall positive cumulative effect.

Catch limits and possession limits for each of the managed resources have been specified to ensure these rebuilt stocks are managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from annual specification measures established in previous years on the managed resources are largely dependent on how effective those measures were in meeting their intended objectives and the extent to which mitigating measures were effective. Overages may alter the timing of commercial fishery revenues (revenues realized a year earlier), and there may be impacts on some fishermen caused by unexpected reductions in their opportunities to earn revenues in the commercial fisheries in the year during which the overages are mitigated.

Despite the potential for negative short-term effects on fishing-related businesses and communities, the expectation is that there would be a positive long-term effect on them due to the long-term sustainability of red, silver, and offshore hake stocks. Overall, the proposed actions in this document would not change the past and anticipated cumulative effects on fishing-related businesses and communities and thus, would not have any significant effect on them individually, or in conjunction with other anthropogenic activities (see table below).

Table 31. Summary of the effects of past, present, and reasonably foreseeable future actions on fishing-related businesses and communities.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Direct Positive**	
Red, Silver, and Offshore Hakes Specifications	**Direct Positive**	
Developed, Apply, and Redo Standardized Bycatch Reporting Methodology	**Potentially Indirect Negative**	
Amendment to address ACL/AMs implemented	**Potentially Direct Positive**	
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Mixed**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Mixed**	
Beach nourishment – Sand placement	**Positive**	
Marine transportation	**Mixed**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Mixed**	
National Offshore Aquaculture Act of 2007	**Uncertain – Likely Mixed**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Mixed**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Mixed**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Negative**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Negative**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on fishing-related businesses and communities.**	

7.7.6 Preferred action on all VECs

The Council has identified its preferred action alternatives in Section 5.0. The cumulative effects of the range of actions considered in this document can be considered to make a determination if significant cumulative effects are anticipated from the preferred alternatives. The direct and indirect impacts of the proposed action on the VECs are described in Section 7.0. The magnitude and significance of the cumulative effects, which include the additive and synergistic effects of the preferred alternatives, as well as past, present, and future actions, have been taken into account throughout this Section 7.7. The action proposed in this annual specifications document builds off action taken in the original FMP and subsequent amendments and framework documents. When this action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in these past FMP documents and this document, there are no significant cumulative effects associated with the preferred alternatives in this document (26).

Table 32. Magnitude and significance of the cumulative effects; the additive and synergistic effects of the 2015-2017 preferred alternatives, as well as past, present, and future actions.

VEC	Status in 2013 (for greater detail also see NEFMC 2014)	Net Impact of P, Pr, and RFF Actions	Impact of the Preferred Alternatives for 2015-2017	Significant Cumulative Effects
Red, Silver, and Offshore Hake Stocks	Complex and variable (Section 6.1 and 6.2)	Direct positive (Section 7.7.5.1)	Low positive (Sections 7.1 and 7.2)	**None**
Non-target Species and Bycatch	Complex and variable (Section 6.3)	Direct positive (Section 7.7.5.2)	Neutral or mixed (Sections 7.3)	**None**
Physical Environment and EFH	Complex and variable (Section 6.4)	Indirect positive (Section7.7.5.3)	Neutral (Sections 7.4)	**None**
Protected Resources	Complex and variable (Section 6.5)	Indirect positive (Section7.7.5.4)	Neutral (Sections 7.5)	**None**
Fishery-related Businesses and Communities	Complex and variable (Section 6.6)	Direct positive (Section7.7.5.5)	Short-term low negative to low positive; Long-term positive (Sections 7.6)	**None**

8.0 RELATIONSHIP TO APPLICABLE LAWS

8.1 Magnuson-Stevens Fishery Conservation and Management Act - Consistency with National Standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that regulations implementing any fishery management plan or amendment be consistent with the ten national standards listed below.

8.1.1 National Standard 1

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

The proposed action is compliant with MSA National Standard 1 requirements for an acceptable biological catch (ABC) and interim ABC control rule, and ACL, and accountability measures (AMs). The proposed specifications for fishing years 2015-2017 are consistent with the ABC set through this process and are intended to ensure that overfishing will not take place in the small-mesh multispecies fishery and that the red, silver, and offshore hake stocks will not become overfished.

8.1.2 National Standard 2

Conservation and management measures shall be based on the best scientific information available.

The measures in this action are based on the best and most recent scientific information available including the red and silver hake stock assessments (NEFSC 2011), which includes an independent peer review, as updated by the NEFSC in NEFMC 2014, and recommendations from the Council's Science and Statistical Committee for setting ABCs for northern red and silver hake and southern red hake and whiting.

8.1.3 National Standard 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 proposed action manages each individual small-mesh multispecies stock as a unit throughout its range. Management measures applied to one stock typically apply to the entire range of the stock. To the extent possible while achieving the management objectives and preventing overfishing on individual stocks, management measures in the proposed action and that exist in the FMP apply throughout the range and often throughout both stock areas. This consistency improves understanding, compliance and enforceability, which minimizes costs to the government.

8.1.4 National Standard 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 a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed measures are the same for all vessels in the small-mesh multispecies fishery regardless of the state of residence of the owner or operator of the vessels. Although any fishing mortality control (including possession limits and quotas) result in the allocation of fishery resources, the measures in the proposed action are reasonably expected to promote conservation by continuing to prevent overfishing and rebuild overfished stocks.

8.1.5 National Standard 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 action maintains the efficiency of vessel operations under the total allowable landings (TAL). The TAL allows flexibility for business planning, operational safety and capability of the fleet to catch the ACL/TAL without exceeding it. None of the measures in this action directly allocates small-mesh fishery catches and, therefore, none has economic allocation as its sole purpose.

8.1.6 National Standard 6

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

The proposed action, developed with input of small-mesh multispecies fishermen and processors, accounts for the market-driven nature of the fishery by updating the TAL consistent with changes in the fishery, and allowing flexibility to reach the TAL without exceeding it.

8.1.7 National Standard 7

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

The proposed action would simplify management regulations by adjusting the TAL for fishing years 2015-2017 to be consistent with the stocks' changes in biomass. The proposed action does not duplicate other fishing regulations or fishery management measures. The NE Multispecies FMP is the only management plan that sets harvest limits and fishing regulations for the small-mesh multispecies fishery.

8.1.8 National Standard 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 impacts on such communities.

The proposed action was developed with the input of small-mesh multispecies fishery vessel owners and processors that supported the measures because the specifications would assist them economically by making harvesting operations efficient. This flexibility would keep the small-mesh multispecies fishery economically viable and sustainable. Due to the small size of the small-mesh multispecies fishery, there

are a limited number of participants, and consequently a limited number of communities. This action is not expected to change the individuals or communities affected by this fishery.

8.1.9 National Standard 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 proposed action is not expected to have any impact on bycatch of red, silver, or offshore hakes, or other species.

8.1.10 National Standard 10

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

The proposed action allows flexibility for vessels to harvest when conditions are optimal, reducing exposure to safety hazards at sea. This management action does not change any of the measures designed to promote the safety of human life at sea, and no measure in the proposed action reduces the flexibility of vessel operators to respond to hazardous conditions at sea.

8.1.11 Magnuson-Stevens Act FMP Requirements

Section 303 (a) of FCMA contains 15 required provisions for FMPs that are listed below. The requirement applies to the FMP, and in some cases, the FMP as amended, and not the submission document for the proposed action.

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States;

Foreign fishing is not allowed under this management plan or this action, so specific measures are not included to specify and control allowable foreign catch.

(2) contain a description of the fishery;

An updated description of the fishery is included in the SAFE Report for Fishing Year 2013 (NEFMC 2014).

(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 proposed action would set specifications that are consistent with sustainable and optimum yield (Section 4.4). The information utilized to make this decision is summarized, along with an update assessment of northern red and silver hake and southern red and silver hake, is contained in the SAFE Report for Fishing Year 2013 (NEFMC 2014).

(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;

Vessels operating in the fishery and those that have been permitted to fish for small-mesh multispecies have the capacity to harvest optimum yield. Existing regulatory restrictions to manage large-mesh multispecies bycatch and limits on domestic and foreign market demand limit catch.

(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;

Vessels on small-mesh multispecies trips must submit Vessel Trip Reports (VTRs) for each fishing trip. Dealers are also required to submit reports on the purchases of small-mesh multispecies from permitted vessels. Current reporting requirements are detailed in 50 CFR 648.7.

(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;

The proposed action does not contain any measures that would penalize vessels that were prevented from harvesting small-mesh multispecies because of weather of other ocean conditions.

(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;

Essential fish habitat for red, silver, and offshore hakes was defined in the Omnibus Habitat Amendment 12 (NEFMC 2000), which was implemented in 2002. This action does not change the essential fish habitat designations. The Council currently is updating EFH designations for all NEFMC-managed species, including the small-mesh multispecies, in an omnibus amendment that is expected to be implemented in 2015.

(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;

Scientific needs are continuously reviewed and revised by the Council's Research Steering Committee and the Northeast Stock Assessment Workshop, which consult with NMFS, the Council and its Plan Development Teams, Science and Statistical Committee and species oversight committees about scientific data needs.

(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;

Impacts on fishing communities affected by this action can be found in Section 7.6.

(10) specify objective and measureable 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;

The Amendment 19 to the NE Multispecies FMP (NEFMC 2011) established criteria to determine whether the small-mesh multispecies stocks were either in an overfished condition, subject to overfishing, or both. This action does not change those criteria.

(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;

This action does not include changes to the current Standardized Bycatch Reporting Methodology implemented under the Standardized Bycatch Reporting Methodology Omnibus Amendment (Amendment 15 to the NE Multispecies FMP; NEFMC 2007) implemented in February 2008. This methodology is expected to assess the amount and type of bycatch in the small-mesh multispecies fishery and help identify ways the fishery can minimize bycatch and mortality of bycatch which cannot be avoided.

(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;

Recreational catches are a very small proportion of total catches of red and silver hakes and are almost non-existent for offshore hake. As such, the catches are accounted for within the 5% allowance for management uncertainty, but were estimated in the SAFE Report (NEFMC 2014).

(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;

Amendment 19 as updated by the SAFE Report (NEFMC 2014) provides a description of the commercial small-mesh multispecies fishery. There is no recreational or charter fishing that target small-mesh multispecies, but red and silver hake are often captured for bait, particularly in the fishery that targets Bluefin tuna.

(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 stocks are subject to catch restrictions to rebuild stocks and any vessel may currently enter the fishery by obtaining a Multispecies Category K permit.

(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 proposed action maintains an ABC, annual catch limit, total allowable landings and accountability measures that would prevent overfishing and ensure accountability.

8.2 National Environmental Policy Act of 1969 (NEPA)

8.2.1 Finding of No Significant Environmental Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order (NAO) 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 (CEQ) 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 NAO 216-6 criteria and CEQ'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?

The proposed action establishes catch and landing limits for each small-mesh multispecies stock that are consistent with the FMP objectives and the recommendations of the Council's SSC. The proposed measures are not expected to result in overfishing. The proposed action will ensure the long-term sustainability of harvests from small-mesh multispecies stocks. The biological impacts of the proposed action on target species are analyzed in Sections 7.1 and 7.2.

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

The proposed action establishes catch and landing limits for each small-mesh multispecies stock and therefore is not expected to significantly alter fishing methods or activities. The proposed action is not expected to jeopardize the sustainability of any non-target species. The biological impacts of the proposed action on non-target species are analyzed in Section 7.3.

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

The proposed action as described in Section 5.0 of the EA is not expected to cause substantial damage to the ocean, coastal habitats, and/or EFH as defined under the MSA and identified in the FMP. In general, bottom-tending mobile gear, primarily otter trawls, has the potential to adversely affect EFH for the species detailed in Section 6.4 of the EA. The specifications and possession limits proposed in this action could, under certain conditions, increase the amount of time that bottom trawling vessels spend fishing for small-mesh multispecies, but the adverse impacts of this increased level of fishing on benthic habitats would not be expected to be significant.

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

The propose action does not alter the manner in which the industry conducts fishing activities for the target species. Therefore, no changes in fishing behavior that would affect safety are anticipated. The overall effect of the proposed actions on these fisheries, including the communities in which they operate, will not 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 proposed action is not expected to substantially alter fishing methods or activities. It is not expected to substantially increase fishing effort or substantially modify the spatial and/or temporal distribution of current fishing effort (see Section 7.1.2). Some redistribution of fishing effort to avoid excessive catches of northern red hake are expected, but this redistribution is expected to be relatively minor in time and space with respect to the seasonal distribution of endangered or threatened species and marine mammals. In addition, measures in place to protect endangered or threatened species, marine mammals, and critical habitat for these species would remain in place (see discussion in Section 7.5). Therefore, this action is not expected to be significant or adversely affect endangered or threatened species, marine mammals, or critical habitat in any manner not considered in previous consultations on the fisheries.

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.)?

The proposed action establishes catch and landing limits for small-mesh multispecies stocks. The proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. The action is not expected to substantially alter fishing methods or activities or fishing effort or the spatial and/or temporal distribution of current fishing effort.

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

The proposed action is not expected to have a substantial impact on the natural or physical environment. The proposed action is not expected to alter fishing methods or activities or substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, there are no social or economic impacts interrelated with significant natural or physical environmental effects.

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

The impacts of the proposed measures on the human environment are described in Section 7.0 of the EA. The proposed action merely establishes catch and landing limits for the small-mesh multispecies stocks.

The proposed action is based upon measures contained in the FMP which have been in place for years. In addition, the scientific information upon which the annual quotas are based has been peer-reviewed and is the most recent information available. Therefore, the measures contained in this action are not expected to be highly controversial.

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?

Historic or cultural resources such as shipwrecks may be present in the area where the small-mesh multispecies fishery is prosecuted. However, 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 proposed action 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?

The impacts of the proposed action on the human environment are described in Section 7.0 of the EA. The proposed action establishes catch and landing limits for each small-mesh multispecies stock. The proposed action is not expected to significantly alter fishing methods or activities, and is not expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The measures contained in this action are not expected to have highly uncertain, unique, or unknown risks on the human environment.

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

As discussed in Section 7.7, the proposed action is not expected to have cumulatively significant impacts when considered with the impacts from other fishing and non-fishing activities. The improvements in the condition of the stock (i.e. preventing overfishing) are expected to generate cumulative positive impacts overall. The proposed action, 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.

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?

Although shipwrecks may be 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 proposed action 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?

The proposed action establishes catch and landing limits for small-mesh multispecies stocks. There is no evidence or indication that this fishery has ever resulted in the introduction or spread of nonindigenous species. The proposed action is not expected to significantly alter fishing methods or activities, and is not expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, it is highly unlikely that the proposed action would be expected to result in the introduction or spread of a non-indigenous 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 establishes catch and landing limits for small-mesh multispecies stocks. The proposed action is not expected to significantly alter fishing methods or activities, and is not expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort. When new stock assessment or other biological information about these species becomes available in the future, then the specifications may be adjusted according to the FMP and MSA. Therefore, the proposed action will not result in significant effects, nor does it 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?

The proposed action establishes catch and landing limits for small-mesh multispecies stocks. The proposed action is not expected to alter fishing methods or activities such that they threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The proposed action has been found to be consistent with other applicable laws (see Sections 8.3 to 8.9).

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?

The impacts of the proposed action on the biological, physical, and human environment are described in Section 7.0. The cumulative effects of the proposed action on target and non-target species are detailed in Section 7.7. The proposed action is not expected to significantly increase fishing effort or substantially alter the spatial and/or temporal distribution of current fishing effort. The improvements in the condition of the stock through implementation of ACLs based on the MSY-based fishing mortality target contained in the FMP are expected to generate positive insignificant impacts overall.

DETERMINATION

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

4/29/15

John K. Bullard
for Regional Administrator, Greater Atlantic Region, NMFS Date

8.3 Marine Mammal Protection Act (MMPA)

None of the specifications proposed in this document are expected to alter fishing methods or activities. Therefore, this action is not expected to affect marine mammals or critical habitat in any manner not considered in previous consultations on the fisheries.

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Sections 6.5 and 7.5.

8.4 Endangered Species Act (ESA)

Section 7 of the Endangered Species Act 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 proposed action is not expected to substantially change the amount of small-mesh fishing effort or the way the fishery is prosecuted, due to market limitations and restrictions on when and where vessels may use small-mesh trawls to target red hake and whiting. Changes in the northern red hake possession limit are intended to change fishing behavior to avoid catching red hake, but these changes are not expected to be significant relative to the broader distribution of any Endangered Species.

Based on the information available at this time (Sections 6.5 and 7.5), the Council believes that NMFS will concur that the action proposed for the small-mesh multispecies fishery would not be likely to jeopardize any ESA-listed species or alter or modify any critical habitat.

8.5 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the Coastal Zone Management Act (CZMA) of 1972, as amended, 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. The CZMA provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council has developed this specification package and will submit it to NMFS; NMFS must determine whether this action is consistent to the maximum extent practicable with the CZM programs for each state (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina). Letters documenting NMFS' determination will be sent to the coastal zone management program offices of each state.

8.6 Administrative Procedure Act (APA)

Section 553 of the APA 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 NEFMC is not requesting any abridgement of the rulemaking process for this action.

8.7 Information Quality Act (IQA)

Utility of Information Product

The information presented in this document is 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. The intended users of the information contained in this document include individuals involved in the small-

mesh multispecies fishery, (e.g., fishing vessels, processors, fishery managers), and other individuals interested in the management of the small-mesh multispecies fishery. The information contained in this document will be helpful and beneficial to owners of vessels holding limited access small-mesh multispecies permits since it will notify these individuals of the measures contained in this specification package. This information will enable these individuals to adjust their management practices and make appropriate business decisions. 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 information contained in this document includes detailed and relatively recent information on the small-mesh multispecies resource and, therefore, represents an improvement over previously available information. This document will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act and, therefore, may be improved based on comments received.

This document is available in several formats, including printed publication, and online through the NEFMC's web page (www.nefmc.org). The *Federal Register* notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Greater Atlantic Regional Fisheries Office (www.greateratlantic.fisheries.noaa.gov), and through the Regulations.gov website. The *Federal Register* documents will provide metric conversions for all measurements.

Integrity of Information Product

The information product meets the standards for integrity under the following types of documents:

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson-Stevens Fishery Conservation and Management Act; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act.)

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 NMFS adheres to the standards set out in Appendix III, "Security 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 of Information Product

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, Fishery Management Plan Process; the Essential Fish Habitat 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. Several sources of data were used in the development of the specification package. These data sources included, but were not limited to, historical and current landings data from the Commercial

Dealer database, vessel trip report (VTR) data, and fisheries independent data collected through the NMFS bottom trawl surveys. The analyses contained in this document were prepared using data from accepted sources. These analyses have been reviewed by members of the Whiting Plan Development Team and by the SSC where appropriate.

Despite current data limitations, the conservation and management measures considered for this action were selected based upon the best scientific information available. The analyses important to this decision used information from the most recent complete calendar years, generally through 2012. The data used in the analyses provide the best available information on the number of permits, both active and inactive, in the fishery, the catch (including landings and discards) by those vessels, the landings per unit of effort (LPUE), and the revenue produced by the sale of those landings to 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 the small-mesh multispecies fishery. The policy choice is clearly articulated in Section 3.0, that being the management alternative considered in this action. The supporting science and analyses, upon which the policy choice was based, are summarized and described in Sections 6.0 and 7.0, and in the Amendment 19 EA. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency. The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Greater Atlantic Regional Fisheries Office, and NOAA Fisheries Service Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, 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. In preparing this action for the NE Multispecies FMP, NMFS must comply with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Information Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas). The Council has determined that the proposed action is consistent with the National Standards of the Magnuson-Stevens Act and all other applicable laws.

8.8 Paperwork Reduction Act (PRA)

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

8.9 Regulatory Flexibility Act (RFA)

The purpose of the Regulatory Flexibility Analysis (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure such proposals are given serious consideration. The RFA does not contain any decision criteria; instead the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of various alternatives contained in the FMP or amendment (including framework management measures and other regulatory actions) and to ensure the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct an Initial Regulatory Flexibility Analysis (IRFA) for each proposed rule. The IRFA is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. An IRFA is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." In addition to analyses conducted for the RIR, the IRFA provides: 1) A description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; and, 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule.

If it is clear that an action would not have adverse or disproportional impacts to small entities, the RFA allows Federal agencies to certify the proposed action(s) as not having a "significant impact on a substantial number of small entities", rather than preparing an IRFA. The agency must then prepare a certification memo to the Small Business Administration (SBA) that documents 1) a statement of basis and purpose of the rule; 2) a description and estimate of the number of small entities to which the rule applies; 3) a description and estimate of economic impacts on small entities, by entity size and industry; 4) an explanation of the criteria used to evaluate whether the rule would impose significant economic impacts; 5) an explanation of the criteria used to evaluate whether the rule would impose impacts on a substantial number of small entities; and, 6) a description of, and explanation of the basis for, assumptions used. The decision on whether or not to certify is generally made after the final decision on the preferred alternatives for the action and may be documented at either the proposed rule or the final rule stage.

Description of reasons why action by the agency is being considered

The purpose of the actions and need for management is described in Section **Error! Reference source not found.**. Briefly, the purpose of these actions is to set red and silver hake specifications for the 2015-2017 fishing years, correct for accountability measure (AM) adjustments that were made based on a previous underestimate of the acceptable biological catch (ABC) and resultant landings limits, and consider measures that will reduce the risk of continuing overfishing of northern red hake. The small-mesh multispecies specifications are intended to meet many of the goals and objectives for this fishery by establishing catch limits that promote sustainable yield and prevent overfishing.

Statement of the objectives of, and legal basis for, the proposed actions

The objective of the preferred alternatives and other alternatives, including the "no action" alternatives, are described in Section **Error! Reference source not found.**, as well as in Amendment 19 to the Northeast Multispecies FMP. Amendment 19 established a process and framework for setting annual catch limits (ACLs) and accountability measures (AMs), as required by the 2007 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act.

Description and estimate of the number of small entities to which the proposed rule will apply

Small entities include "small businesses," "small organizations," and "small governmental jurisdictions." The Small Business Administration (SBA) has established size standards for all major industry sectors in the U.S., including commercial finfish harvesters (NAICS code 114111), commercial shellfish harvesters (NAICS code 114112), other commercial marine harvesters (NAICS code 114119), for-hire businesses (NAICS code 487210), marinas (NAICS code 713930), seafood dealers/wholesalers (NAICS code 424460), and seafood processors (NAICS code 311710). A business primarily involved in finfish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $20.5 million for all its affiliated operations worldwide. For commercial shellfish harvesters, the other qualifiers apply and the receipts threshold is $5.5 million. For other commercial marine harvesters, for-hire businesses, and marinas, the other qualifiers apply and the receipts threshold is $7.5 million. A business primarily involved in seafood processing is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual employment, counting all individuals employed on a full-time, part-time, or other basis not in excess of 500 employees[1] for all its affiliated operations worldwide. For seafood dealers/wholesalers, the other qualifiers apply and the employment threshold is 100 employees. A small organization is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. Small governmental jurisdictions are governments of cities, boroughs, counties, towns, townships, villages, school districts, or special districts, with population of fewer than 50,000.

The proposed actions regulate commercial fish harvesting entities engaged in the Northeast multispecies limited access fishery and the small mesh multispecies fishery. For the purposes of the RFA analysis, the ownership entities, not the individual vessels, are considered as regulated entities.

Ownership entities in regulated commercial harvesting businesses

Individually-permitted vessels may hold permits for several fisheries, harvesting species of fish that are regulated by several different fishery management plans, even beyond those impacted by the proposed actions. Furthermore, multiple permitted vessels and/or permits may be owned by entities affiliated by stock ownership, common management, identity of interest, contractual relationships, or economic dependency. For the purposes of this analysis, ownership entities are defined by those entities with common ownership personnel as listed on permit application documentation. Only permits with identical ownership personnel

[1] In determining a concern's number of employees, SBA counts all individuals employed on a full-time, part-time, or other basis. This includes employees obtained from a temporary employee agency, professional employee organization or leasing concern. SBA will consider the totality of the circumstances, including criteria used by the IRS for Federal income tax purposes, in determining whether individuals are employees of a concern. Volunteers (i.e., individuals who receive no compensation, including no in-kind compensation, for work performed) are not considered employees. Where the size standard is number of employees, the method for determining a concern's size includes the following principles: (1) the average number of employees of the concern is used (including the employees of its domestic and foreign affiliates) based upon numbers of employees for each of the pay periods for the preceding completed 12 calendar months; (2) Part-time and temporary employees are counted the same as full-time employees. [*PART 121—SMALL BUSINESS SIZE REGULATIONS §121.106*]

are categorized as an ownership entity. For example, if five permits have the same seven personnel listed as co-owners on their application paperwork, those seven personnel form one ownership entity, covering those five permits. If one or several of the seven owners also own additional vessels, with sub-sets of the original seven personnel or with new co-owners, those ownership arrangements are deemed to be separate ownership entities for the purpose of this analysis.

Ownership entities are identified on June 1st of each year based on the list of all permit numbers, for the most recent complete calendar year, that have applied for any type of Northeast Federal fishing permit. The current ownership data set is based on calendar year 2013 permits and contains gross sales associated with those permits for calendar years 2011 through 2013. Ownership entities are classified into the categories established by the SBA (primarily finfish, primarily shellfish, or primarily for-hire businesses) based on which activity generated the greatest gross revenue in calendar year 2013. The determination as to whether the entity is large or small is based on the average revenue from 2011 through 2013.

Directly Regulated Small-Mesh Multispecies Fishing Entities

The small-mesh exempted fishery allows vessels to harvest species in designated areas using mesh sizes smaller than the minimum mesh size required by Regulated Mesh Area (RMA) regulations. To participate in the small-mesh multispecies (whiting) exempted fishery, vessels must hold either a limited access multispecies permit (categories A, C, D, E or F) or an open access multispecies permit (category K). Note that a vessel cannot hold more than one of these Northeast multi-species permit types at a time, but that a business entity that holds may hold multiple numbers of these permit types. The current possession limit for red hake at the start of the fishing season is 5,000 pounds, regardless of area. Initial possession limits for silver and offshore hake combined vary by exemption area, management area (north or south) and mesh size used.

Limited access multispecies permit holders can target small mesh multispecies with mesh smaller than the minimum regulated mesh size when not fishing under a DAS and while declared out of the fishery using VMS. Limited access multispecies permit holders may land whiting or red hake on any DAS or sector trip, up to the possession limits for vessels using mesh greater than 3 inches specified at 648.86(d)(1)(iii), or the incidental possession limit specified at 648.86(d)(4), if triggered for that stock.

An open access, category K permit holder may fish for small mesh multispecies when participating in an exempted fishing program. This category includes all gear types. These permits are required to submit Vessel Trip Reports, but are not subject to VMS requirements. Vessels with open access category K permits are subject to the same possession limits and accountability measures for small-mesh multispecies that limited access permit holders are.

Therefore, entities holding one or more limited access multispecies permits or one or more open access category K multispecies permits are the entities holding permits that are directly regulated by the proposed action – these are the permits that have the potential to land small mesh multispecies for commercial sale. These include entities that could not be classified into a business type because they did not earn revenue from landing and selling fish in 2013 and so are considered to be small.

There were 1,087 distinct ownership entities based on calendar year 2013 permits that could potentially target small mesh multispecies. Of these, 1,069 are categorized as small and 18 are categorized as large entities per the SBA guidelines (Table 33 and Table 34).

Table 33 - Description of directly regulated small-mesh multispecies fishing entities by business type and size.

Business Type	Number of	Number of

	entities	small entities
Primarily finfish	383	383
Primarily shellfish	433	415
Primarily for-hire	106	106
Not Classified (no revenue)	165	165
Total Number of Regulated Entities	**1,087**	**1,069**

Table 34 - Description of directly regulated small-mesh multispecies fishing entities by gross sales.

Sales category	Number of entities	Number of small entities	Mean gross sales	Median gross sales	Mean permits per entity	Max permits per entity
<$50K	372	372	$ 11,144	$ 1,700	1.23	30
$50-100K	114	114	$ 73,398	$ 73,510	1.18	3
$100-500K	308	308	$ 243,720	$ 224,295	1.49	5
$500K-1mil	121	121	$ 702,378	$ 691,322	1.52	5
$1-5.5mil	154	151	$ 1,953,605	$ 1,599,791	2.10	13
$5.5-20.5mil	15	3	$ 9,851,628	$ 7,405,052	9.53	28
$20.5mil+	3	0	$ 22,115,947	$ 20,622,616	16.67	19

Directly Regulated, Active Small-Mesh Multispecies Fishing Entities Impacted

While 1,087 commercial entities are directly regulated by the proposed action, not all of these entities land small mesh multispecies for commercial sale. Commercial entities that do not land small mesh multispecies for sale, while regulated by the proposed action, will not be impacted by the proposed action. Commercial fishing harvesting entities that land small mesh multispecies for sale are both directly regulated and possibly impacted by the proposed actions.

To estimate the number of commercial entities that may experience impacts from the proposed action, active small-mesh multispecies entities are defined as those entities containing permits that are directly regulated and that landed any silver hake or red hake in 2013 for commercial sale. These active small-mesh multispecies entities are described in Table 35, Table 36, and Table 37, and are a subset of those entities described in Table 33 and 34. There are 298 potentially impacted, directly regulated commercial entities, 295 (99.0%) of which are classified as small entities.

Table 35 - Description of potentially impacted, directly regulated active small-mesh multispecies fishing, by business type and size

Business Type	Number of entities	Number of small entities
Primarily finfish	179	179
Primarily shellfish	80	77
Primarily for-hire	39	39
Total	**298**	**295**

Table 36 - Description of potentially impacted, directly regulated, active small mesh multispecies fishing entities, gross sales.

Sales category	Number of entities	Number of small entities	Mean gross sales	Median gross sales	Mean permits per entity	Max permits per entity
<$50K	37	37	$ 21,758	$ 21,132	1	3
$50-100K	32	32	$ 77,191	$ 79,737	1	2
$100-500K	129	129	$ 265,592	$ 244,317	1	5
$500K-1mil	58	58	$ 707,809	$ 702,582.50	2	4
$1-5.5mil	39	39	$ 1,768,741	$ 1,379,304	2	10
$5.5-20.5mil	4	1	$ 14,054,224	$ 15,076,518	17	28

Table 37. Total number of potentially impacted, directly regulated entities landing small-mesh multispecies by stock area and number classified as small.

Stock	Vessels and entities	Total	Small
Northern Red Hake	Number of business entities	32	32
Northern Silver Hake	Number of business entities	120	119
Southern Red Hake	Number of business entities	151	150
Southern Silver Hake	Number of business entities	123	120

Note: Entities may be landing more than one stock listed in the table above.

Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

The proposed actions do not introduce any new reporting, record keeping, or other compliance requirements.

Identification of all relevant Federal rules, which may duplicate, overlap or conflict with the proposed rule

The proposed actions do not duplicate, overlap or conflict with any other Federal Rules.

Significance of economic impacts on small entities

Substantial Number Criterion

In colloquial terms, substantial number refers to "more than a few." The vast majority of the regulated entities impacted by this action (99%) are considered small, and therefore preferred alternative will have impacts on a substantial number of small entities.

Significant Economic Impacts

The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability. Disproportionality refers to whether or not the regulations place small commercial entities at a significant competitive disadvantage to large commercial entities. Profitability refers to whether or not the regulations significantly reduce profits for a substantial number of small commercial entities.

Description of impacts on small entities

The proposed actions will impact all commercial entities, large and small, harvesting silver or red hake, in both the northern and southern management area. This section estimates impacts to all these entities-large and small; an analysis that was based only on small entities was not possible. However, 295 of 298 (995) of directly regulated commercial entities potentially impacted by the proposed action are small business entities. Small commercial entities are not placed at a significantly competitive disadvantage by either the proposed changes to the ACLs or by the proposed changes to the northern red hake possession limits and in-season accountability measures. All 32 of commercial entities harvesting red hake in the northern management area are small; therefore the preferred possession limit and accountability measures for the stock will not have disproportional impacts on the small entities that harvest northern red hake.

Overall, the net impact on profits from the preferred alternatives for the proposed 2015-2017 specifications, possession limits and accountability measures is expected to be neutral to low positive, compared to the no action alternative. While the non-preferred alternative for northern hake possession limits and accountability measures, which does not include a lower initial possession limit for northern red hake relative to the to the no action alternative, may result in slightly more positive impact on profits than the preferred alternative relative to the no action alternative (+5.6% in estimated northern red hake revenue), the preferred alternative is expected to be more effective at reducing the risk of overfishing, thereby increasing the likelihood that the fishery will remain a viable source of fishing revenues for small mesh multispecies entities in the long term.

Impacts from the proposed actions are summarized separately below for 1) alternatives for the 2015-2017 ACLs for northern and southern stocks of silver and red hake and 2) alternatives to modify the northern red hake possession limits. Detailed discussion of the analyses that estimated the impacts of these alternatives is included in Section 7.6.

Alternatives for 2015-2017 ACL specifications

Two alternatives are considered and described in detail in Section 5.1: the preferred alternative (updated specifications) and the no-action alternative (no change from the 2013 specifications). While the catch limits for silver hake and red hake in the southern management area are more restrictive in the preferred alternative than in the no action alternative, the lower limits are not expected to be binding. Landings of southern silver hake and southern red hake in 2013 were well below both the 2013 TAL and the 2015-2017 specifications proposed by the preferred alternative (Table 38). Therefore, impact on profitability from the preferred alternative, which lowers the ACLs for the southern whiting and red hake stocks, is expected to be neutral, relative to the no action alternative.

The specifications proposed by the preferred alternative for both red hake and silver hake in the northern management area are less restrictive than those under the no action alternative. The less restrictive TAL proposed by the preferred alternative can be expected to have neutral or low positive impacts on profit relative to the TAL under the no action alternative, depending on market conditions (whether the market price for these species remains constant or changes, which partially depends on the elasticity of demand for these species). Assuming that demand for these species is highly elastic and market price for these species remains constant, the ability to land additional amounts of stocks in the northern area would be expected to have a low positive, but likely small, impact on profitability, relative to the no action alternative.

Overall, the expected impact from the proposed changes to the ACL specifications is neutral to low positive, relative to the no-action alternative.

Table 38. Landings of small-mesh multispecies stocks in fishing year 2013 compared to Total Annual Landings (TAL) limits for 2013 and those proposed for 2015-2017.

Stock	2013 Landings (mt)	2013 TAL (mt)	Proposed annual TAL (mt)	Percent change in annual TAL
Northern silver hake	1,322	8,973	19,947	+122%
Northern red hake	105	90.3	104.2	+15%
Southern whiting	4,951	27,255	23,833	-13%
Southern red hake	499	1,336	1,309	-2%

Alternatives for the northern red hake possession limits and in-season accountability measures

Changes to management measures are being proposed to reduce the potential for northern red hake catches to exceed the ABC, as they did in fishing years 2012 and 2013, and potentially cause overfishing. Red hake biomass is increasing, and it is uncertain how much catch may increase as a result. Two alternatives to the no action alternative are being proposed. None of these alternatives propose changing the post-season accountability measure (AM).

The three alternatives under consideration are described in detail in Section 5.2. The no action alternative would make no changes current initial northern red hake possession limit of 5,000 pounds or to the in-season accountability measure trigger (45% of TAL). When the AM trigger is reached, the possession limit would fall from 5,000 pounds to the incidental 400 pound limit, which would remain in effect until the end of the fishing year. In 2013, estimated revenues from northern red hake were $72,456, earned from landing 105 metric tons (Table 23). However, the fishery exceeded the TAL of 90.3 metric tons during this year.

Section 7.1.2 presents the results of sensitivity analyses of the impacts of the two action alternatives to the no action alternative. These analyses apply the proposed management rules to landings reported on vessel trip reports (VTRs) for fishing year 2011-2013 trips that landed red or silver hake or both, with small-mesh trawls or any other gear. The sensitivity analyses model the economic impacts of the three alternatives, based on different assumptions about red hake targeting and discarding activity.

The preferred alternative lowers the initial possession limit for northern red hake from 5,000 pounds to 3,000 pounds. The possession limit would fall to 1,500 pounds once landings reach 45% of TAL. In addition, this alternative proposes a correction to the AM trigger that would lower the possession limit to the 400 pound incidental limit once 62.5% of the TAL is landed. This alternative is intended to discourage trips that target or partially target northern red hake. As discussed in section 7.6.2, of the 471 trips in the northern area that landed red hake in 2013, only 8 (1.7%) of these trips appeared to target red hake.

The preferred alternative may reduce catch and landings (on trips targeting red hake) early in the season. However, the alternative may also potentially delay the time when the AM is triggered, allowing more red hake catch to be landed later in the season. It is expected, based on input from industry advisors, that the in-season AM trigger would be delayed with a lower initial possession limit, increasing revenue for trips taken later in the fishing year and reducing discards. Compared to the no action alternative, lowering the northern red hake possession limit from 5,000 to 3,000 lbs. and adjusting the AM trigger from 45% to 65% of the TAL is expected to increase northern red hake catch by a small fraction (0.1% to 1.4%). Revenues from landing northern red hake are estimated to be $60,514 under the preferred alternative (Table 25). This represents a 19.7% decrease from 2013, but in 2013 the TAL was exceeded. Under the no action alternative for 2015, estimated revenues from landing northern red hake are expected to be $57,483. The preferred alternative is estimated to result in 5.3% more revenue from landing northern red hake than the no-action alternative. The preferred alternative's impact on profitability is expected to be neutral to low positive relative to the no-action alternative. Actual impact will depend on how fishermen that target this species in the northern area adapt their targeted fishing activity (and discarding activity) to the proposed lower initial possession limit and in-season accountability measures.

A third, non-preferred alternative is a correction to AM trigger that would increase the AM trigger for northern red hake from 45% of the TAL to 62.5% of the TAL, at which point the possession limit would fall from 5,000 pounds to the incidental level of 400 pounds. This alternative would allow marginally higher northern red hake catches and revenue relative to the no action alternative. Northern hake revenue from the non-preferred alternative is estimated to be $63,493, which is 10.5% and 4.9% higher the estimated northern hake revenue under the no-action and preferred action alternatives, respectively (Table 25).The non-preferred action alternative's impact on profitability is expected to be low positive relative to the no-action alternative. Actual impact will depend on how fishermen that target this species in the northern area adapt their targeted fishing activity (and discarding activity) to the proposed lower in season accountability measures.

8.10 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."

A "significant" regulatory action for E.O. 12866 purposes 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.

Section **Error! Reference source not found.** assesses of the costs and benefits of the proposed actions. The analysis included in this RIR and the IRFA above further demonstrates that the proposed actions are not "significant" because they will not have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy or a sector of the economy, productivity, jobs, the environment, public health, or safety, or State, local, or tribal governments or communities.

Objectives

The objectives of the Northeast Multispecies FMP, as they relate to small-mesh multispecies, are to manage fisheries catching red, silver, and offshore hake that maintain stock size at levels capable of sustaining MSY on a continuing basis. In addition to existing restrictions on fishing through exemption areas and seasons to minimize groundfish bycatch, other measures are intended to optimize size selectivity and keep landings from temporarily flooding limited market demand. These measures include red and silver hake possession limits. The silver hake possession limits are higher when a vessel uses large mesh, providing an incentive to avoid catching juvenile or small silver hake. Amendment 19 established and specified catch and landings limits which are deemed to be sustainable, including accountability measures which either reduce the risk that catches will exceed the ACL or to account for those overages in later seasons if they do occur.

Consistent with these objectives, this action seeks to update the catch limits, based on the best scientific information available, without increasing the probability of overfishing. There should be no adverse impacts on yield, management compatibility, or enforcement.

Affected Entities

Entities affected by this action are entities that fish for small mesh multispecies, and therefore may be affected by a change in the ACLs for these species or a change in the possession limits and accountability measures for these species. The primary entities affected by this regulation are commercial fishing entities that target small mesh multi-species. Some fishing entities may possess small mesh multi-species for use as bait. However, these entities are not expected to be negatively impacted by the proposed actions. Recreational fishermen generally do not target small mesh multispecies, and are not expected to be impacted the proposed action. Consumers of these species are not expected to be adversely affected by the proposed actions.

The number of affected entities was estimated by the number of entities that had trips that landed any amount of red or silver hake in 2013. These entities are described in Table 39, Table 40 and Table 41.

Table 39 - Description of affected entities by business type.

Business Type	Number of entities
Primarily finfish	208
Primarily shellfish	95
Primarily for-hire	128
Not Classified (no revenue)	3
Total Number of Regulated Entities	**434**

Table 40 - Description of affected entities by gross sales.

Sales category	Number of entities	Mean gross sales	Median gross sales	Mean permits per entity	Max permits per entity
<$50K	85	$ 18,722	$ 14,569	1.12	3
$50-100K	55	$ 76,104	$ 76,264	1.16	4
$100-500K	170	$ 264,565	$ 241,921	1.41	5
$500K-1mil	72	$ 698,048	$ 694,213	1.53	4
$1-5.5mil	48	$ 1,701,401	$ 1,358,191	2.27	10
$5.5-20.5mil	4	$ 14,054,224	$ 15,076,518	16.5	28

Table 41. Total number of entities landing small-mesh multispecies by stock area and number classified as small.

Stock	Vessels and entities	Total
Northern Red Hake	Number of business entities	41
Northern Silver Hake	Number of business entities	143
Southern Red Hake	Number of business entities	246
Southern Silver Hake	Number of business entities	146

Note: Entities may be landing more than one stock listed in the table above.

Problem statement

The purpose of the measures proposed in this action is set forth in Section **Error! Reference source not found.** of this document.

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.

The preferred alternative for the proposed 2015-207 ACLs specifications is expected to result in neutral to low positive impacts to entities that land small mesh multi-species for commercial sale. There are no expected negative impacts to entities related to commercial harvest of small mesh multi-species (e.g. dealers, fishing gears suppliers) from the preferred alternative, relative to the no-action alternative.

The preferred alternative for the northern red hake possession limits and accountability measures is estimated to result in low positive impacts to affected entities. Compared to the no-action alternative, it is estimated that fewer trips that land northern red hake will have reduced northern red catch and revenue from landings. In addition, predicted revenues from landing northern red hake are higher under the preferred alternative than they are under the no-action alternative (Table 25). The non-preferred action alternative may yield higher landings and revenues in the short term, but it is not preferred because of the need to minimize the risk of exceeding the TAL from northern red hake, as occurred in 2012 and 2013. Finally, the preferred alternative for the northern red hake possession limits and accountability measures is expected to minimize the risk of exceeding the ACL and may yield positive long term benefits by maintaining a sustainable fishery for those entities that land small-mesh multispecies.

There are no expected substantial distributional issues, and neutral to low positive expected impacts on income and employment related to slightly increased fishing opportunities. The cumulative impacts of management and regulations are not expected to change from those described in the underlying 2015-2017 Specifications Environmental Assessment (EA) in this document and in the Environmental Impact Statement for Amendment 19 (NEMFC 2013). There are no other expected social concerns.

Determination of Executive Order 12866 significance

The proposed actions are not expected to have any adverse impact on fishing vessels, purchasers of seafood products, ports, recreational anglers, and operators of party/charter businesses. The proposed actions are expected to have neutral to low positive, but not significant, impacts for commercial fishermen and associated businesses. 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 actions are also similar to specification adjustments in this or other NEFMC-managed fisheries, and as such do not raise novel legal or policy issues. As such, the proposed actions are not considered significant as defined by Executive Order 12866.

9.1 GLOSSARY

ABC – "Acceptable biological catch" means a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL.

ACL – "Annual catch limit" is the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures (AMs).

Adult stage – One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect – Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation – A group of animals or plants occurring together in a particular location or region.

AMs – "Accountability measures" are management controls that prevents ACLs or sector ACLs from being exceeded, where possible, and correct or mitigate overages if they occur.

Amendment – a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure".

Availability – refers to the distribution of fish of different ages or sizes relative to that taken in the fishery.

Benthic community – Benthic means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. Benthic community refers to those organisms that live in and on the bottom.

Biological Reference Points – specific values for the variables that describe the state of a fishery system which are used to evaluate its status. Reference points are most often specified in terms of fishing mortality rate and/or spawning stock biomass.

Biomass – The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1+, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

Biota – All the plant and animal life of a particular region.

Bivalve – A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom tending mobile gear – All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear – All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear

which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

B_{MSY} – the stock biomass that would produce maximum sustainable yield (MSY) when fished at a level equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity.

Bycatch – (v.) the capture of non-target species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity – the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch – The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment – Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Continental shelf waters – The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Council – New England Fishery Management Council (NEFMC).

CPUE – Catch per unit effort. This measure includes landings and discards (live and dead), often expressed per hour of fishing time, per day fished, or per day-at-sea.

DAS – A day-at-sea is an allocation of time that a vessel may be at-sea on a fishing trip. For vessels with VMS equipment, it is the cumulative time that a vessel is seaward of the VMS demarcation line. For vessels without VMS equipment, it is the cumulative time between when a fisherman calls in to leave port to the time that the fisherman calls in to report that the vessel has returned to port.

Demersal species – Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Discards – animals returned to sea after being caught; see Bycatch (n.)

Environmental Assessment (EA) – an analysis of the expected impacts of a fishery management plan (or some other proposed federal action) on the environment and on people, initially prepared as a "Draft" (DEA) for public comment. The Final EA is referred to as the Final Environmental Assessment (FEA).

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Exclusive Economic Zone (EEZ) – for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exempted fisheries – Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitation Rate – the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fathom – A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Final preferred alternative – The management alternative chosen by the Council in the final amendment, submitted to the Secretary of Commerce for approval and if approved publication as a proposed rule.

Fishing effort – the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Fishing Mortality (F) – (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. F is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

$\mathbf{F_{MSY}}$ – a fishing mortality rate that would produce the maximum sustainable yield from a stock when the stock biomass is at a level capable of producing MSY on a continuing basis.

$\mathbf{F_{MAX}}$ – the fishing mortality rate that produces the maximum level of yield per recruit. This is the point beyond which growth overfishing begins.

FMP (Fishery Management Plan) – a document that describes a fishery and establishes measures to manage it. This document forms the basis for federal regulations for fisheries managed under the regional Fishery Management Councils. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

$\mathbf{F_{threshold}}$ – 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Growth Overfishing – the situation existing when the rate of fishing mortality is above F_{MAX} and then the loss in fish weight due to mortality exceeds the gain in fish weight due to growth.

Individual Fishing Quota (IFQ) – A Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Landings – The portion of the catch that is harvested for personal use or sold.

Larvae (or Larval) stage – One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the egg for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and

is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited Access – a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation, and the participants remain constant over time (with the exception of attrition).

Limited-access permit – A permit issued to vessels that met certain qualification criteria by a specified date (the "control date").

LPUE – Landings per unit effort. This measure is the same as CPUE, but excludes discards.

Maximum Sustainable Yield (MSY) – the largest average catch that can be taken from a stock under existing environmental conditions.

Mesh selectivity (ogive) – A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 is the length where 50% of the fish encountered are retained by the mesh.

Meter – A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton – A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,204.6 lbs. A thousand metric tons is equivalent to 2.204 million lbs.

Minimum Biomass Level – the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long-term.

Mortality – Noun, either referring to fishing mortality (F) or total mortality (Z).

Multispecies – the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Natural Mortality (M) – a measurement of the rate of fish deaths from all causes other than fishing such as predation, cannibalism, disease, starvation, and pollution; the rate of natural mortality may vary from species to species.

Non-preferred alternative - All alternatives in the final amendment that were not chosen as a “final preferred alternative” are by definition non-preferred alternatives.

Northeast Shelf Ecosystem – The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northern stock area – for red and silver hake, fish are assumed to be in the southern stock area when the catches originate from fishing in statistical areas 464 to 515, or area 561. See map at http://www.nero.noaa.gov/nero/fishermen/charts/stat1.html.

Observer – Any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

OFL – "Overfishing limit" means the annual amount of catch that corresponds to the estimate of the maximum fishing mortality threshold applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

Open access – Describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Optimum Yield (OY) – the amount of fish which-
(a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;
(b) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and
(c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Overfished – A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing – A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

PDT (Plan Development Team) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council; the Council has a Whiting PDT that meets to discuss the development of this FMP.

Preferred alternative – An alternative that was favored by the Council in the draft amendment document and DEA based on analysis available at that time and based on input from the Whiting Advisory Panel.

Proposed Rule – a federal regulation is often published in the Federal Register as a proposed rule with a time period for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Rebuilding Plan – a plan designed to increase stock biomass to the B_{MSY} level within no more than ten years (or 10 years plus one mean generation period) when a stock has been declared overfished.

Recruitment overfishing – fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Recruitment – the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. "Recruitment" also refers to new year classes entering the population (prior to recruiting to the fishery).

Regulated groundfish species – cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation – an index of exploitation derived by dividing landings by trawl survey biomass. This variable does not provide an estimate of the proportion of removals from the stock due to fishing, but allows for general statements about trends in exploitation.

Sediment – Material deposited by water, wind, or glaciers.

Small-mesh multispecies – red hake, silver hake, and offshore hake

Small-mesh trawls – specified trawls that are exempt from large-mesh fishery regulations pertaining to trawl with cod end mesh greater than 5.5 or 6 inches square or diamond.

Southern stock area – for red and silver hake, fish are assumed to be in the southern stock area when the catches originate from fishing in statistical areas 521 to 543, area 562, or areas 611 to 639. See map at http://www.nero.noaa.gov/nero/fishermen/charts/stat1.html.

Spawning stock biomass (SSB) – the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Status Determination Criteria – objective and measurable criteria used to determine if overfishing is occurring or if a stock is in an overfished condition according to the National Standard Guidelines.

Stock assessment – An analysis for determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock – A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Surplus production models – A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include trends in stock biomass, biomass weighted fishing mortality rates, MSY, FMSY, BMSY, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Surplus production – Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). BMSY is often defined as the biomass that maximizes surplus production rate.

Survival rate (S) – Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB) – an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAL – Total allowable landings, which for whiting management is equivalent to the ACL minus the dead discard rate. The Federal TAL pertains to landings taken by Federally permitted vessels and excludes landings made by vessel with no Federal permits that fish in state waters

Ten-minute- "squares" of latitude and longitude (TMS) – A measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles at 40° of latitude. This is the spatial area that EFH designations, biomass data, and some of the effort data have been classified or grouped for analysis.

Total mortality – The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Yearclass (or cohort) – Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

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