Draft Amendment 19 to the Northeast Multispecies FMP
(Small Mesh Multispecies)
Environmental Assessment
Regulatory Impact Review
and
Initial Regulatory Flexibility Analysis

February ???, 2011

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

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1.0 EXECUTIVE SUMMARY

This document serves as Draft Amendment 19 to the Northeast Multispecies FMP, the Draft Environmental Assessment (EA) which updates and supplements the original EIS for the small mesh multispecies fishery (available at http://www.nefmc.org/nemulti/planamen/GFAmend12.pdf) contained in Amendment 12 (NEFMC 2000). The purpose of the amendment is to establish and implement Annual Catch Limits (ACLs) and Accountability Measures (AMs) to bring management of the small mesh fishery into compliance with the re-authorized Magnuson Fishery Conservation and Management Act, using best available science developed during and derived from the recent benchmark assessment (NEFSC 2011a).

This amendment is a follow up on a Secretarial Amendment which NMFS has developed at the same time as and in parallel with this amendment. The Secretarial Amendment follows a different approval procedure and contains many but not all of the alternatives included in this document.

The Secretarial Amendment is expected to include the same ACL specifications and stock wide Total Allowable Landings (TALs) for red, silver, and offshore hake that are included in this document. The Secretarial Amendment also proposes a general specifications process, an annual monitoring process, stock wide TAL triggers, in-season accountability measures, and a pound-for-pound post season accountability measure. These measures, at whatever levels are approved in the final Secretarial Amendment, are considered to be No Action in this document.

Alternatives in this document that are not included in the Secretarial Amendment include a formal adoption of the overfishing definitions (Section 5.1.1) that were recommended by the SAW during the benchmark assessment, landings targets (Section 5.3.2 and 5.3.3) and in-season AMs (Section 5.4.3) for the small mesh area exemption programs, quarterly TAL allocations for the southern stock area (Section 5.5.2 and 5.5.3), roll over and adjustment provisions for unlanded TALs or overages (Section 5.3.4), year-around red hake possession limits for the northern and southern stock areas by mesh category (Section 5.7), two alternatives for post-season AMs (Section 5.9), a more detailed specifications process (Section 5.2.1), two annual monitoring alternatives (Section 5.2.2), and new reporting requirements (Section 5.8). The Council may select AMs that differ in value or parameters than those approved in the Secretarial Amendment.

Red, silver, and offshore hakes are fish in families of cod-like stocks known as hakes. Individually, these managed stocks are described as hakes in this document. The fishery however is known as the whiting fishery and collectively catches of silver and offshore hake are known as ‘whiting’. Sometimes this document will refer to the whiting fishery, which is meant to describe vessels using small mesh to target one or all of red, silver, and offshore hakes. Occasionally, this document will describe landings or catch as ‘whiting’, which is meant to include silver and offshore hake, but not red hake.

1.1 Document organization

This is an integrated document that complies with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, and other applicable laws. The Affected Environment section of this EA describes the Biological Environment (Section 7.2 including a description of the biology, the population dynamics of the hake stocks, and a summary/description of the fishery), the Physical Environment and Essential Fish Habitat (Section 7.3), and Human Communities (aka Economic and Social Environment; Section 7.5).

The document also includes a discussion of the Management Background (Section 3.3) and a brief History of the Fishery (Section 3.2), the Purpose and Need for action (Section 3.1), a description of Proposed Alternatives (Section 4.0) and Considered And Rejected Alternatives (Section 6.0), an analysis of Environmental Consequences of the proposed alternatives (Sections 8.1 to 8.5), and a Cumulative Effects analysis (Section 8.6; including an evaluation of past, present, and reasonably foreseeable future actions). The Environmental Consequences evaluation includes an analysis of the direct and indirect impacts on hakes and the small mesh multispecies fishery (Section 8.1.1), on protected species (Section 8.1.2.3), on habitat, including essential fish habitat (EFH; Section 8.4), on the economy and on social and community factors (Section 8.5).

1.2 Specifications and Alternatives

The Allowable Biological Catch (ABC) and ACL specifications for fishing years 2012-2014 by stock are presented as a separate section. Section 4.0 describes and adopts the ACL specifications (ABCs and ACLs, Sections 4.1 and 4.2, respectively) which were developed by the Whiting PDT, recommended by the Council's SSC, and through this amendment approved by the Council. The ACL framework described below is consistent with the Magnuson-Act requirements, National Standard 1 guidelines, the recommendations of the Council's SSC, and best available science, and therefore there are no proposed alternatives. The Council is not proposing any changes to the framework and the analysis developed for the Secretarial Amendment is still applicable. Therefore, no additional analysis is necessary.

Total Allowable Landings (TAL) allocations are part of the ACL specifications, but the Secretarial Amendment is expected to implement stock-wide annual TALs for red and silver hakes (offshore hakes would be counted against the southern stock area TAL for silver hake, aka 'whiting'). Amendment 19 includes these stock wide annual TAL specifications, but also includes alternatives for landings targets by small mesh area program in the northern stock area and by quarter in the southern stock area. Since these are alternatives which differ from the status quo. They are included in Sections 5.3 and 5.5, and are analyzed in Section 8.1.1.1 of this document.

The proposed alternatives described in Section 5.0 include TAL allocations and AMs, a proposed specification and annual monitoring process, year around red hake possession limits, and new reporting requirements to enable NMFS to monitor the fishery consistently with the proposed ACL specifications. Overfishing definitions, ABCs, ACLs, the specification process, the annual monitoring process, monitoring requirements, and post-season AMs that would apply to both the northern and southern stock areas (Map 2) are described in alternatives that apply to both stocks. Various TAL allocation alternatives (Sections 5.3 and 5.5) and in-season AM alternatives (Sections 5.4 and 5.6) apply differently in the northern and southern stock areas are described in separate sets of alternatives. The TAL and in-season AM alternatives differ by stock area largely because of the small mesh exemption area programs that are present entirely in the northern stock area. And the Council may choose different approaches in each area for the proposed action in the final amendment.

The table below summarizes the measures included in each alternative and a general approach or philosophy behind each alternative.

Alternative	Proposed measures	Philosophy or rationale
Section 5.1	New overfishing definitions; red and silver hake	Recommended by the SAW using best available science
Section 5.2	Specification framework and annual monitoring procedures	Enables the Council to keep abreast of changes in the fishery, respond to changes through framework adjustments, and change specification via a new (for the small mesh multispecies fishery) specification process, similar to that used to adjust specifications in other FMPs.
Section 5.3	Northern stock area TALs for red and silver hakes	Stock wide TALs to account for expected discards and state water landings, with potential sub-allocations for the small mesh area exemption programs, possibly with a roll over provision for unlanded TAL for the Cultivator Shoals Area.
Section 5.4	Northern stock area accountability measures (AMs) • Incidental red hake possession limit alternatives of 200, 300, and 400 lbs. • Incidental silver hake possession limit alternatives of 500, 1000, and 2000 lbs.	TAL triggers and incidental possession limits to reduce the risk that catches will exceed ACLs, by restricting the directed hake fisheries and by putting limits on incidental catch.
Section 5.5	Southern stock area TALs for red and silver hakes	Stock wide TALs to account for expected discards and state water landings, with potential sub-allocations by quarter, possibly with roll over provisions.
Section 5.6	Southern stock area accountability measures (AMs) • Incidental red hake possession limit alternatives of 200, 300, and 400 lbs. • Incidental silver hake possession limit alternatives of 500, 1000, and 2000 lbs.	TAL triggers and incidental possession limits to reduce the risk that catches will exceed ACLs, by restricting the directed hake fisheries and by putting limits on incidental catch.

Alternative	Proposed measures	Philosophy or rationale
Section 5.7	Year around red hake possession limits; ranges vary by stock area and mesh category North: • 1,000 to 3,000 lbs. for vessels using 2.5 to 5 inch mesh trawls • 300 to 1,200 lbs. for vessels using any other gears or mesh size South: • 4,000 to 10,000 lbs. for vessels using 2.5 to 5 inch mesh trawls • 2,000 to 6,000 lbs. for vessels using any other gears or mesh size	Intended to reduce the risk of derby-style fishing behavior that might close the directed fishery early. Mesh-based possession limits are intended to improve size selectivity.
Section 5.8	TAL monitoring and reporting requirements	Monitoring and reporting changes needed to assign landings and catch to appropriate stock boundaries
Section 5.9	Post-season accountability measures	If all else fails, one of the two alternatives will account for catches that exceed the stock wide annual catch limits.

1.3 Proposed action

The proposed action will be identified in the Final Amendment 19 document, to be prepared after the Council conducts public hearings.

1.4 Final EA analysis

The proposed action will be analyzed and changes to the draft EA analyses in this document will be included in the Final Amendment 19 document, to be prepared after the Council conducts public hearings.

1.5 Conclusions

Conclusions will be based on the final alternatives selected by the Council as a proposed action and will include public comment on the Draft Amendment 19 document and EA.

2.0 TABLE OF CONTENTS

2.1 Appendix

Document 1a – Options for Whiting/Hake Biological Reference Points, MSY Proxies, and ABC– Whiting PDT, March 2011

Document 1b – Guidance on Acceptable Biological Catch for Whiting Hake – Scientific and Statistical Committee, April 2011

Document 2a – Recommendations for Red, Silver, and Offshore Hake (Whiting) Allowable (sic) Biological Catches for 2012-2014 – Whiting PDT, July 2011

Document 2b – Acceptable Biological Catch Recommendations for Whiting for Fishing Years 2012-2014 - Scientific and Statistical Committee, September 2011

Document 3 – Analysis of Potential Red and Silver Hake Possession Limit Alternatives – Whiting PDT, November 2011

2.2 List of Tables

2.3 List of Figures

2.4 List of Maps

2.5 List of Acronyms

ABC	Acceptable biological catch
ACL	Annual Catch Limit
AIM	An Index Method of Analysis (the assessment model used to determine red and silver hake status)
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ANPR	Advanced Notice of Proposed Rulemaking
AP	Advisory Panel
APA	Administrative Procedures Act

ASMFC	Atlantic States Marine Fisheries Commission
B_{MSY}	Biomass that would allow for catches equal to Maximum Sustainable Yield when fished at the overfishing threshold (F_{MSY})
BiOp, BO	Biological Opinion, a result of a review of potential effects of a fishery on Protected Resource species
CAI	Closed Area I
CAII	Closed Area II
CEQ	Council on Environmental Quality
CPUE	catch per unit of effort
DAM	Dynamic Area Management
DAS	days-at-sea
DFO	Department of Fisheries and Oceans (Canada)
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DPWG	Data Poor Working Group
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing mortality rate
FEIS	Final Environmental Impact Statement
FMP	fishery management plan
FW	framework
FY	fishing year
GARM	Groundfish Assessment Review Meeting
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
GRT	gross registered tons/tonnage
HAPC	habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
IFQ	individual fishing quota
ITQ	individual transferable quota
IVR	interactive voice response reporting system
IWC	International Whaling Commission
LOA	letter of authorization
LPUE	landings per unit of effort
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act

MPA	marine protected area
MRFSS	Marine Recreational Fishery Statistics Survey
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSMC	Multispecies Monitoring Committee
MSY	maximum sustainable yield
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NLSA	Nantucket Lightship closed area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NT	net tonnage
OBDBS	Observer database system
OLE	Office for Law Enforcement (NMFS)
OY	optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SAP	Special Access Program
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SNE	Southern New England
SNE/MA	Southern New England-Mid-Atlantic
SSB	spawning stock biomass
SSC	Social Science Committee
TAC	Total allowable catch
TAL	Total allowable landings
TED	Turtle excluder device
TEWG	Turtle Expert Working Group
TMS	ten minute square
TRAC	Trans-boundary Resources Assessment Committee
TSB	total stock biomass
USCG	United States Coast Guard

USFWS	United States Fish and Wildlife Service
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	Vessel trip report
WGOM	Western Gulf of Maine
YPR	Yield per recruit

3.0 INTRODUCTION AND BACKGROUND

3.1 Purpose and Need for the Action (EA, RFA)

Amendment 19's purpose is to implement a mechanism for specifying annual catch limits (ACL) and accountability measures (AM) as required by the re-authorized Magnuson Fishery Conservation and Management Act (MSA; Magnuson Stevens Act). The Dec 2010 benchmark assessment (NEFSC 2011a and NEFSC 2011b) is the best available science to use for determining Acceptable Biological Catch (ABC) and ACL specifications. This action would follow up and supplement a Secretarial Amendment which is expected to be implemented by NMFS on May 1, 2012. The amendment also includes alternatives to add measures to the Secretarial Amendment describing a specification process and implementing accountability measures to reduce the risk that catches will exceed ACLs and to account for overages by reducing future catch limits if they occur. This amendment will also establish specifications (catch and landings limits) for the 2012-2014 fishing years, with a new specification process to make adjustments as necessary for the 2015 fishing year and for every three years thereafter. Amendment 19 also considers setting year around red hake possession limits, a measure that is not included in the Secretarial Amendment. The proposed red hake possession limits would be related to the trawl mesh size used by the vessel to encourage use of more size selective gear, similar to the existing silver hake possession limits.

This action is needed to establish the mechanism for implementing ACLs and AMs which is intended to reduce the risk of overfishing, by taking into account scientific uncertainty in estimating the overfishing limit and management uncertainty.

3.2 History of the Fishery

The commercial silver hake fishery in the United States may have begun as early as the mid-1800s (Anderson et al, 1980). Prior to the early 1920s, landings of silver hake (commonly known as 'whiting') totaled less than seven million pounds annually, and most fishermen considered whiting a nuisance fish because its soft flesh tended to spoil quickly without refrigeration. Technological advances in handling, freezing, processing, and transportation aided in expanding this market as well as creating new opportunities to capitalize on whiting. Until this time, the fishery operated primarily inshore using pound nets. As the demand for whiting increased, operations began to extend offshore, and vessels started using otter trawls to catch more whiting. By 1950, U.S. commercial silver hake landings had increased to more than 45,000 metric tons. Floating traps, gillnets, purse seines, and longline trawls were also employed. Today, almost all of the U.S. commercial silver hake catch is taken with otter trawls.

Prior to 1960, the commercial exploitation of silver hake in the Northwest Atlantic was exclusively by U.S. fleets. Distant water fleets had already reached the banks of the Scotian Shelf by the late 1950s, and by 1961, scouting/research vessels from the USSR were fishing on Georges Bank. By 1962, factory freezer fleets (ranging from 500 to 1,000 GRT) intensively exploited the whiting and red hake stocks on the Scotian Shelf and on Georges Bank. Led by the USSR, the distant water fleet landed an increasingly larger share of the silver hake catch from the Gulf of Maine, Georges Bank, and northern Mid-Atlantic waters. In 1962, the distant water fleet landed 41,900 tons of silver hake (43% of the total silver hake landings), but that number had increased to 299,200 tons (85% of the total silver hake landings) in 1965. That year marked the year of the highest total commercial silver hake landings, 351,000 tons. Recreational landings of silver hake in the southern New England and Mid-Atlantic areas were also at record levels between 1955 and 1965, averaging about 1,360 tons. Unable to sustain such high rates of

fishing, the abundance of silver hake off the U.S. Atlantic coast began to decline. As a result, total commercial catches decreased significantly after 1965 and reached a 20-year low of 55,000 tons in 1970. U.S. recreational landings also dropped after 1965 to about half the levels of previous years.

After 1970, catches of silver hake by the distant water fleet in U.S. waters increased again, especially in southern New England and the Mid-Atlantic. Between 1971 and 1977, distant water fleet landings from the southern stock averaged 75,000 tons annually and accounted for 90% of the total harvest from the southern stock. The size and efficiency of distant water fleet factory ships also increased, many ranging between 1,000 and 3,000 GRT. In 1973, the International Commission for the Northwest Atlantic Fisheries established temporal and spatial restrictions that reduced the distant water fleet to small "windows" of opportunity to fish for U.S. silver hake. These windows restricted the distant water fleet to the continental slope of Georges Bank and the Mid-Atlantic. As effort control regulations increased, foreign fleets gradually left most areas of Georges Bank.

Although foreign fishing had ceased on Georges Bank by about 1980 and in the Mid-Atlantic by about 1986, the U.S. groundfish fleet's technologies and fishing practices began to advance, and between 1976 and 1986, fishing effort (number of days) increased by nearly 100% in the Gulf of Maine, 57% on Georges Bank, and 82% in southern New England (Anthony, 1990). Such increases in effort, although directed primarily towards principal groundfish species (cod, haddock, yellowtail flounder), were accompanied by a 72% decline in silver hake biomass. In turn, U.S. East Coast landings of silver hake began to decline, dropping to 16,100 tons in 1981. Since that time, landings have remained relatively stable, but at much lower levels in comparison to earlier years. U.S. East Coast silver hake catches are taken almost exclusively by otter trawls, either as bycatch from other fisheries or through directed fisheries targeting a variety of sizes of silver hake.

3.3 Management Background (EA,RFA)

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. A summary of the biological information from the most recent stock assessment (SAW 51) can be found in Section 4.1.

The small-mesh multispecies fishery is managed as a series of exemptions from the Northeast Multispecies Fishery Management Plan (FMP), which is managed by the New England Fishery Management Council (Council). In 2007, the reauthorized Magnuson-Stevens Act required all managed species to have annual catch limits (ACLs) and measures to ensure accountability (accountability measures, or "AMs"). The Magnuson-Stevens Act required ACLs and AMs by 2010 for stocks that were experiencing overfishing, and by 2011 for all other stocks. The Council started developing Amendment 19 with scoping hearings in early 2010, but the amendment was delayed to accommodate the Dec 2010 benchmark assessment. And in order to conduct public hearings on the draft amendment and accommodate the Secretarial review process, the amendment will not be implemented prior to the Magnuson-Stevens Act deadline. In order to meet that deadline, NMFS proposed a Secretarial Amendment on December 23, 2011 (76 FR 80318).

The Council began development of Amendment 19 in early 2010, but postponed development until new science could be considered in a benchmark assessment (NEFSC 2011a and 2011b). Prior assessments were not analytically based, due in large part to conflicting signals of increasing biomass and relatively

fewer large fish (often called 'age truncation', which is often indicative of high fishing mortality) and uncertainties about stock identification. As a result, management previously relied on a set of survey-based biological reference points to determine overfishing and overfished status.

The Council expected that the new benchmark assessment would produce an analytic, model based assessment with appropriate reference points to set ABCs. Survey and fishery data were fitted to various population models, but none fit the data well and none were deemed reliable enough by the 51st SAW (NEMFC 2011a) to determine stock status. Instead, the benchmark assessment produced an index-based update of stock status, like previous assessments, but with newly proposed overfishing definitions.

If the benchmark assessment produced estimates of MSY using analytical models, these reference points could have been used straightaway to estimate ABCs and scientific uncertainty, allowing the Council's SSC to quickly set ABC and develop ACL specifications. Since analytical models were unavailable, the Council directed the Whiting PDT to develop ABC setting methods and recommend ABCs for the small mesh multispecies (hake) stocks using the best available science. The Council reviewed the proposed methods during Apr 2011 (see Document 1a in the Appendix) and ACL recommendations in Aug 2011 (see Document 2a in the Appendix).

The Council intends to finalize Amendment 19 at its April Council meeting and submit Final Amendment 19 shortly thereafter to the Secretary of Commerce for approval. If approved, the final alternatives would be published as a rule and implemented in late 2012. The Council anticipates that the ACL specifications will be consistent with those in the Secretarial Amendment, but that some AMs may differ and apply to management areas and/or fishing year quarters. In addition, Amendment 19 would implement a specification process that is more detailed than contained in the Secretarial Amendment and possibly include year around red hake possession limits by gear.

The following sections summarize the management background and regulations pertaining to small mesh fisheries that target hakes in the Northeast Region. Readers may access the text of these amendments and accompanying regulations via the Council's web page (http://www.nefmc.org/nemulti/planamen/planamen.html).

3.3.1 Amendment 1

The Northeast Multispecies Fishery Management Plan (Multispecies FMP; NEFMC 1985) was approved and implemented in 1985. In addition to regulating groundfish fishing with large mesh and other gears, it defined areas and seasons when fishing for red hake, silver hake, herring, and shrimp was permissible, with the intent on minimizing catches of large mesh groundfish species. Amendment 1 (NEFMC 1987) was implemented on Oct 1, 1987, decreasing the area and season when small mesh fishing for red and silver hake was allowed in an Exempted Fishery Program. Amendment 1 also refined how the 10% allowance for regulated multispecies was defined.

3.3.2 Amendment 4

Amendment 4 (NEFMC 1990) was implemented on June 27, 1991. Among changes to measures regulating large mesh groundfish fisheries, the amendment also made some modifications to the Exempted Fisheries Program that regulated small mesh fishing for hakes and other species. Most of the changes were related to reporting and sea sampling. More importantly, Amendment 4 incorporated red and silver hake into the management unit (i.e. fisheries that targeted red and silver hake became regulated under the FMP), while establishing and defining the Cultivator Shoals Area Small Mesh Program.

Amendment 4 also set a minimum 2.5 inch trawl mesh which restricted fishing for small mesh multispecies, improving size selectivity and reducing bycatch of regulated multispecies.

3.3.3 Amendment 12

Amendment 12 (NEFMC 1999) was implemented on April 28, 2000. Amendment 12 focused on the management of small mesh fisheries targeting hakes and established overfishing definitions and optimum yield for red, silver, and offshore hakes. It made adjustments to the Cultivator Shoals Area Small Mesh Program including adjustments to the fishing season. Most importantly, Amendment 12 established silver hake (aka whiting) and offshore hake possession limits for vessels fishing outside of the Cultivator Shoals Area. These limits varied by mesh size to encourage vessels to use more size selective fishing gear and to reduce targeting of small fish for a juvenile whiting market. Amendment 12 also made other gear regulation adjustments and made allowances for transferring silver hake at sea (for bait).

3.3.4 Reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act

In 2006, the Magnuson-Stevens Act was passed, which updated the original Act as well as the Sustainable Fisheries Act of 1996. The bill reauthorized the MSA for Fiscal Years 2007 through 2013.

The MSA reauthorization contained several provisions that introduced new legal requirements for fishery management. One key change that pertains to this amendment is the following:

- A firm deadline to end overfishing in America by 2011. For stocks that are currently experiencing overfishing, the deadline for ending that overfishing is 2010. Two key approaches are included to achieve this mandate:
    - The reauthorization requires the use of Annual Catch Levels (ACLs) to prevent overfishing. Every management plan must contain an ACL, which is set at a level to ensure that overfishing does not occur in the particular fishery. The ACL is required to be set at or below the Acceptable Biological Catch (ABC) of the fishery. Furthermore, the Councils are directed to follow the recommendations of the Scientific and Statistical Committee (SSC), and the ACL cannot exceed the SSC's recommendation for ABC.
    - Accountability Measures (AMs) are required in each management plan that detail what actions will be taken in the event of an overage of harvest level.

Proposed specifications and measures in this amendment address the above mandate.

3.3.5 Current Management Measures

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

Table 1. 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 30								
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 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 2) for all the areas with that requirement are:

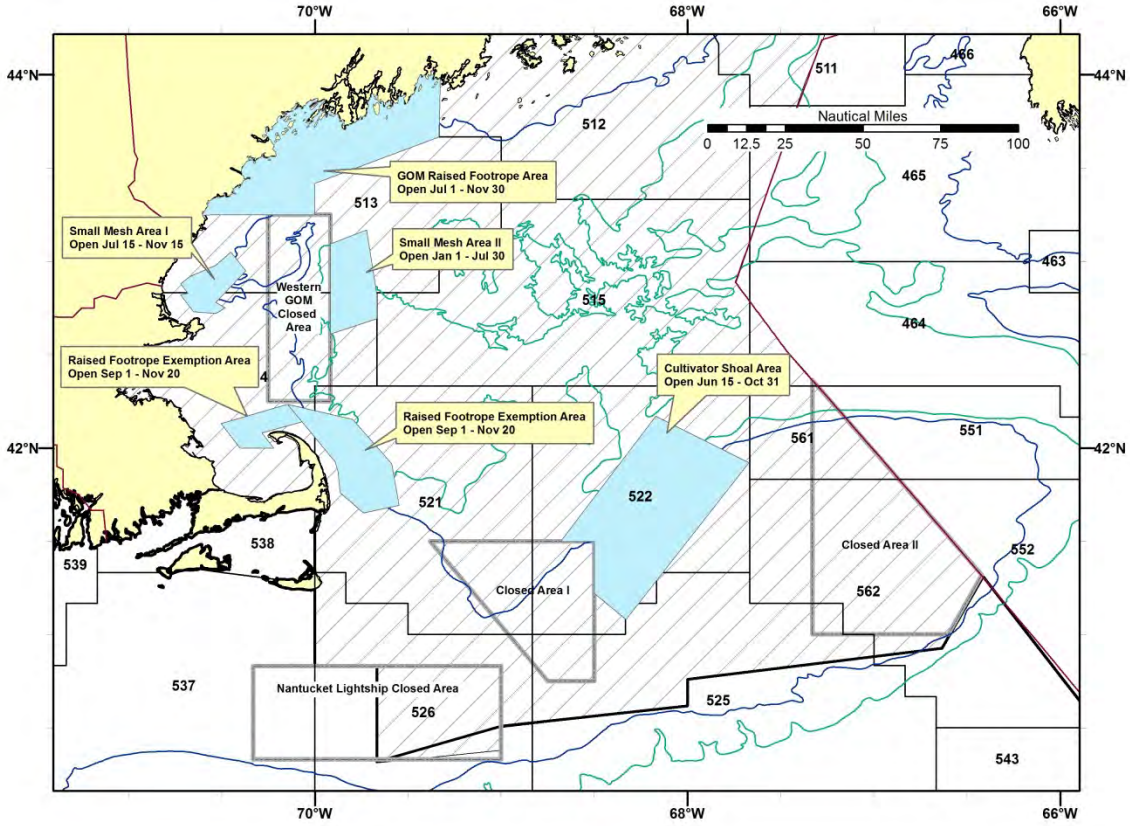
Table 2. Mesh size dependent possession limits.

Codend Mesh Size	Silver and offshore hake, combined, possession limit
Smaller than 2.5”	3,500 lb
Larger than 2.5”, but smaller than 3.0”	7,500 lb
Equal to or greater than 3.0”	30,000 lb

The exemption areas were implemented as part of several different amendments and framework adjustments to the Northeast Multispecies FMP. In 1991, Amendment 4 incorporated silver and red hake and established an experimental fishery on Cultivator Shoal. Framework Adjustment 6 (1994) was intended to reduce the catch of juvenile whiting by changing the minimum mesh size from 2.5 inches to 3 inches. Small Mesh Areas I and II, off the coast of New Hampshire, were established in Framework Adjustment 9 (1995). The New England Fishery Management Council (Council) established essential fish habitat (EFH) designations and added offshore hake to the plan in Amendment 12 (2000). Also in Amendment 12, the Council proposed to establish limited entry into the small-mesh fishery. However, that measure was disapproved by the Secretary of Commerce because it did not comply with National Standard 4[1] as a result of measures that benefited participants in the Cultivator Shoal experimental fishery and because of the “sunset” provision that would have ended the limited entry program at some date. The Raised Footrope Trawl Area off of Cape Cod was established in Framework Adjustment 35 (2000). A modification to Framework Adjustment 35 in 2002 adjusted the boundary along the eastern side of Cape Cod and extended the season to December 31 in the new area. Framework Adjustment 37 modified and streamlined some of the varying management measures to increase consistency across the exemption areas. In 2003, Framework Adjustment 38 established the Grate Raised Footrope Exemption Area in the inshore Gulf of Maine area.

[1] National Standard 4 states that measures “shall not discriminate between residents of different States,” and that fishing privileges must be “fair and equitable to all such fishermen.”

Map 1. Small mesh exemption areas in the Gulf of Maine and on Georges Bank.



Vessels participating in any of the exemption areas must have a Northeast Multispecies limited access or open access category K permit and must have a letter of authorization from the Regional Administrator to fish in Cultivator Shoal and the Cape Cod Raised Footrope areas. None of the exemption areas have a possession limit for red hake. Most of the areas (Small Mesh Areas I and II, the Cape Cod Raised Footrope areas, Southern New England Exemption Area, and the Mid-Atlantic Exemption Area) have mesh size dependent possession limits for silver and offshore hake, combined (Table 2). The Gulf of Maine Grate Raised Footrope Area has a possession limit of 7,500 lb, with a 2.5-inch minimum mesh size, and Cultivator Shoal has a possession limit of 30,000 lb, with a 3-inch minimum mesh size.

3.4 Management Objectives

The Council's objective is to manage fisheries catching red, silver, and offshore hakes to build to and maintain stock size at levels that are capable of sustaining MSY on a continuing basis. In addition to existing restrictions on fishing through small mesh regulations and exemption programs as well as silver hake possession limits specified according to the mesh size used by the vessel, this amendment will establish and specify catch and landings limits which are deemed to be sustainable. The amendment includes 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.

3.5 Methods of Analysis

The analysis of this amendment uses the best available science to identify and set ACL specifications and analyze the potential effects of accountability measures. The ABCs were proposed by the Whiting PDT using reference points and analysis derived from the benchmark assessment (NEFSC 2011a) and approved by the Council's Scientific and Statistical Committee (SSC). The impact analyses (Section 7.1) were developed using data described in the Affected Environment (Section 7.0) and were reviewed by the Whiting PDT. These data and analyses were developed using accepted procedures and comply with the provisions of the Information Quality Act (Section 9.11).

3.6 Maximum Sustainable Yield (MSY) and Optimum Yield (OY)

National Standard 1 requires that FMPs achieve "on a continuing basis, the optimum yield from each fishery for the United States fishing industry." The term "optimum," with respect to yield from a fishery, is defined as 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.

Optimum yield (OY) for silver hake, offshore hake, and red hake will therefore be the amount of fish that results from fishing under the set of rules designed to achieve the plan objectives. It is the amount of fish caught by the fishery when fishing at target fishing mortality rates (F_{target}) at current biomass levels (B_t), or when fishing in a manner intended to maintain or achieve biomass levels biomass capable of producing maximum sustainable yield (MSY) on a continuing basis. Accounting for scientific uncertainty in the estimate of MSY, F_{target} is defined as the mortality that would produce the ACL at existing stock biomass and size selectivity. Expressed as an equation:

$$OY = F_{target} \times (B_t)$$

For a rebuilt stock, B_t is always greater than B_{MSY} (stock biomass capable of sustaining MSY over time). F_{target} is the target level of fishing mortality and is set safely below F_{MSY} (the fishing mortality rate capable of producing MSY over time) to prevent overfishing and ensure that OY can be achieved on a continuing basis. For an overfished stock, B_t is the current stock biomass level estimated or projected from the most recent assessment, and F_{target} is the fishing mortality rate objective that will achieve the desired rebuilding. If the current F, F_{target}, or B_t is unknown, proxy control rules are applied and the long-term potential yield may be a satisfactory proxy for OY.

The target fishing mortality rate (F_{target}) is the rate that will achieve the plan objectives with an acceptable degree of safety or precaution. Factors to be considered in setting F_{target} will be calculated through periodic stock assessments and include the stock size relative to B_{MSY}, the current age structure of the population and recruitment, as well as projected growth and recruitment characteristics of the stock. The Council may also consider social and economic characteristics in setting F_{target} provided the stock rebuilding projections are within the Council's range of precaution.

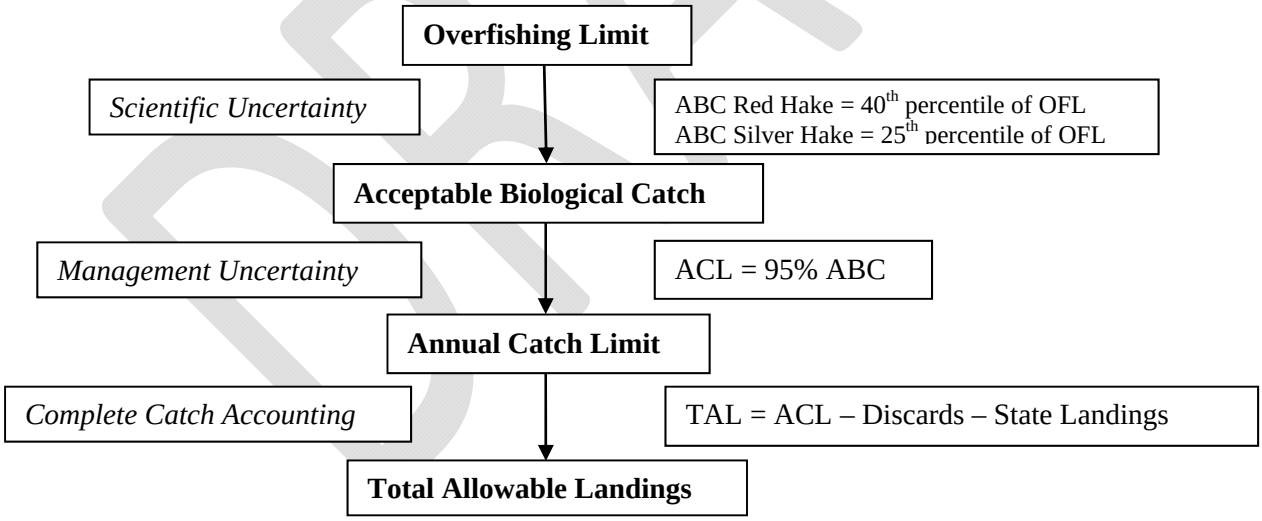
For an overfished stock (no stock is currently overfished), for example, the Council would set a target rate to rebuild the stock within a maximum time, usually not to exceed ten years. On a rebuilt stock, the Council should set F_{target} safely below the threshold level that will produce MSY. In setting target fishing mortality rates, the Council must balance maximizing short-term economic yield and providing for sustained participation of communities in the fishery against the risk or cost of allowing the biomass to decline to levels below B_{MSY}. Thus, the Council will consider social, economic, and ecological factors in setting the F_{target} in addition to considering the risk of not achieving stock recovery in an acceptable time period, or the risk of the rebuilt stock becoming overfished at any given time.

OY, therefore, is not a fixed amount but varies with the status of the stocks in the fishery, but it cannot be above a level that would exceed F_{MSY}. It is a quantity that represents the yield resulting from fishing at target levels on a rebuilt stock or stock complex, or the yield resulting from fishing at target levels designed to rebuild the stock in a specified time frame.

3.7 Acceptable Biological Catch (ABC) and Annual Catch Limit (ACL) Specifications

This amendment proposes ABCs for northern and southern stocks of red and silver hake. Due to insufficient data and science, there is no ABC for offshore hake, but an adjustment has been made in the silver hake ABC for the southern stock to account for customary catches of offshore hake in this mixed species trawl fishery. ACLs for each stock account for management uncertainty by reducing the ABC by 5% and after accounting for state landings and expected discards, the amendment would specify total allowable landings for each stock and species. More details and specifications are given in Sections 4.1, 5.3, and 5.5.

The ACL framework, including the overfishing limits and ABCs is illustrated below:



3.8 Stock Status

Using the biological reference points estimated by the benchmark assessment (NEFSC 2011a) and updated data through the 2010 calendar year and survey data through spring 2011, no stock of red or silver hake is overfished and overfishing is not occurring (see Document 1??? in the Appendix). The

status of offshore hake is unknown because the benchmark assessment (NEFSC 2011a) produced no biological reference points that were reliable for management and status determination.

3.9 Essential Fish Habitat (EFH)

Section 3.4 of the Amendment 11 (NEFMC 1999) described and identified 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.

This amendment proposes no changes to small mesh multispecies (hake) EFH descriptions or designations.

4.0 SMALL MESH MULTISPECIES SPECIFICATION FRAMEWORK WITH SPECIFICATIONS FOR 2012-2014 FISHING YEARS

This section describes and adopts the ABC and ACL specifications (Sections 4.1 and 4.2, respectively) that have been proposed in the Secretarial Amendment and are expected to be implemented. The framework and specifications were developed by the Whiting PDT, recommended by the Council's SSC, and through this amendment approved by the Council. The ACL framework described below is consistent with the Magnuson-Act requirements, National Standard 1 guidelines, the recommendations of the Council's SSC, and best available science, and therefore there are no proposed alternatives. The Council is not proposing any changes to the framework and the analysis developed for the Secretarial Amendment is still applicable. Therefore, no additional analysis is necessary.

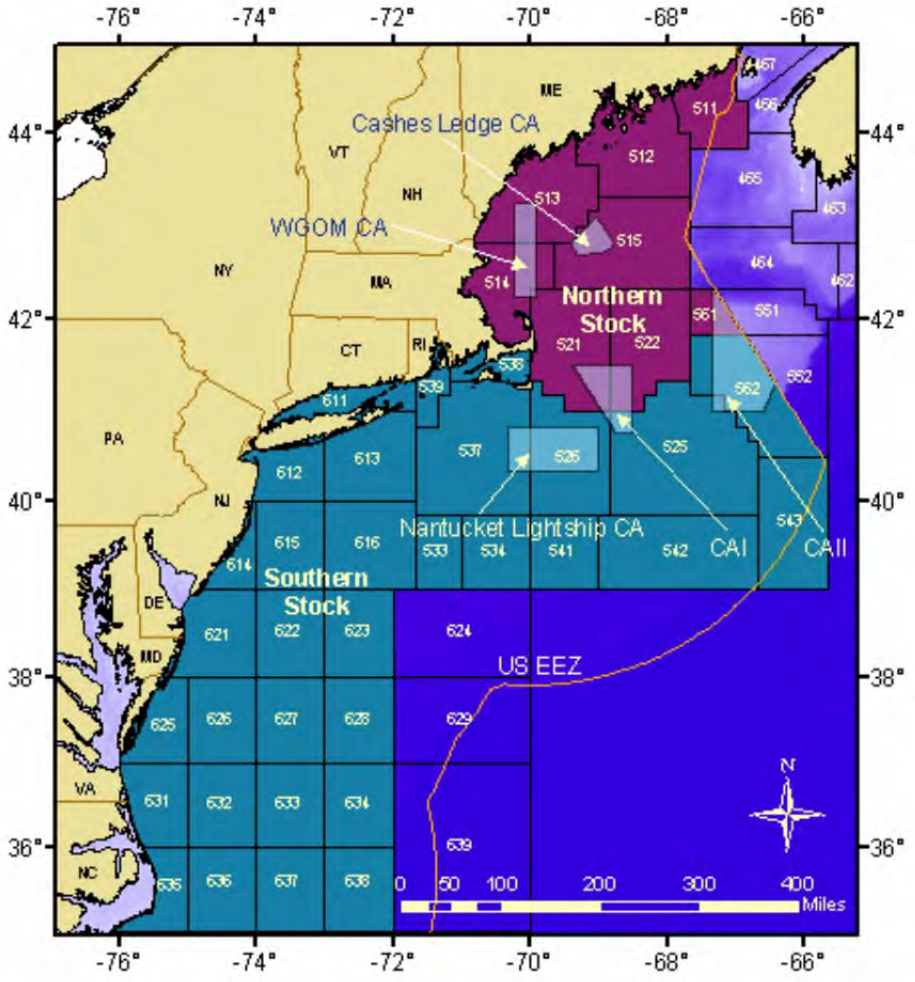
Total Allowable Landings (TAL) allocations are part of the ACL specifications, but there are alternatives that differ from those proposed in the Secretarial Amendment. The Secretarial Amendment proposes stock wide annual TALs for red and silver hake in the northern stock area and for red hake and whiting (silver and offshore hake) in the southern stock area. Although different values are proposed, the Council expects that the final rule for the Secretarial Amendment will include corrections that have been factored into the Amendment 19 analysis. Amendment 19 includes these stock wide annual TAL specifications, but also includes alternatives for landings targets by small mesh area program in the northern stock area and by quarter in the southern stock area. Since these are alternatives which differ from the status quo. They are included in Sections 5.3 and 5.5, and are analyzed in Section **Error! Reference source not found.** of this document.

4.1 Allowable Biological Catch (ABC)

Using proxy values for F_{MSY} approved by the 51st SAW (NEFSC 2011a) and estimates of scientific uncertainty for the reference point and for the three year moving average for NMFS trawl survey biomass, the Council's SSC recommended (see Document 2a in the Appendix) ABCs for red and silver hake by stock area (see Map 2). Offshore hake are caught almost entirely in the southern stock area along the offshore edge of the continental shelf, sometimes as a target species and sometimes as an incidental or mixed catch with silver hake. Furthermore, the 51st SAW (NEFSC 2011a) found that commercial catch and survey indices were too noisy to provide a reliable indicator of stock condition. Therefore, the Whiting PDT recommended and the SSC approved combining the catch from both species into one species complex to account for the catches of silver and offshore hake[2].

[2] AKA 'whiting' or 'southern whiting'

Map 2. Statistical areas used to define the northern and southern red and silver hake stocks.



The intent of establishing an allowable biological catch below F_{MSY} is to take into account scientific uncertainty and risk tolerance that the ABC may cause overfishing. Lower ABCs imply less risk. The small mesh multispecies ABCs are expressed as a percentile of the overfishing level (OFL) distribution that estimates quantifiable scientific uncertainty, with the 50th percentile being risk neutral (see Document 1a in the Appendix). The following ABCs would apply to the 2012-2014 fishing years, serving as a starting point to set other specifications in this amendment.

These and future specifications would continue beyond the 2014 fishing year, unless changed by a planned specification setting process (see Section 5.2.1), a framework action, or a plan amendment.

Described below are the following ABC alternatives:

1. Northern and southern red hake ABCs based on the 40th percentile of the stochastic estimate of OFL.

2. Northern and southern silver hake ABCs based on the 25th percentile of the stochastic estimate of OFL. In the southern stock area, the ABC is increased by 4% to account for the customary

estimated catches of offshore hake.

3. No ABC control rules

4.1.1 Red hake (northern and southern stocks)

All commercial and recreational red hake catches in each stock area (Map 2) will be capped at the following limits to prevent overfishing and account for scientific uncertainty in these limits to prevent overfishing. These limits were drawn from the 40th percentile of the OFL and will apply to specifications beyond using new data, including an updated three year moving average for biomass from the NMFS spring trawl survey.

2012-2014 ABC set at 40th percentile of OFL to account for scientific uncertainty:

- 280.1 mt (89% of OFL; 90% of 2010 catch) north
- 3259 mt (95% of OFL; 241% of 2010 catch)) south

Rationale: The proposed limits are less than the 50th percentile, which is equivalent to the median estimate of F_{MSY} and therefore considered to be risk neutral. Mathematically, the 40th percentile is 89 and 95% of the catches at the OFL, for the northern and southern stock areas, respectively. The values differ in this respect by stock area due to the differences in the distribution of OFL, but account for equivalent levels of scientific risk.

The Council decided that lower and less risky limits on catch (e.g. < 40th percentile on OFL) were not appropriate because of the relatively low economic value and costs of potential consequences of overfishing. Red hake is targeted infrequently and often is a common bycatch in the trawl and scallop dredge fisheries in the NE region. As such, excessively low catch limits that have a low risk could prevent the fishery from reaching optimum yield in these fisheries that target more valuable species.

This is also the ABC control rule that is proposed for the Secretarial Amendment and is likely to be implemented.

4.1.2 Silver hake (northern and southern stocks)

All commercial and recreational silver hake catches in each stock area (Map 2) will be capped at the following limits to prevent overfishing and account for scientific uncertainty in these limits to prevent overfishing. These limits were drawn from the 25th percentile of the OFL and increased by 4% in the southern stock area to account for customary catches of offshore hake (see Section 4.1.3 and Document 2a in the Appendix). The limit at the 25th percentile of OFL will apply to specifications beyond 2014 and will be calculated using new data, including an updated three year moving average for biomass from the NMFS fall trawl survey.

2012-2014 ABC set at 25th percentile of OFL to account for scientific uncertainty:

- 13,177 mt (53% of OFL; 532% of 2010 catch) north
- 33,995 mt (52% of OFL; 459% of 2010 catch)) south

Rationale: The proposed limits are less than the 50th percentile, which is equivalent to the median estimate of F_{MSY} and therefore considered to be risk neutral. Mathematically, the 25th percentile are 53 and 52% of the catches at the OFL for the northern and southern stocks, respectively.

The Council decided that more precaution was needed for silver hake than for red hake because of its higher economic value and relative amount of past and present targeting by the fishery. A core group of trawl vessels with open access groundfish permits target silver hake for specific markets, domestic and foreign. Much of the landings are processed and marketed through dealers in New York City. The vessels that target silver hake with small mesh in exemption areas rely on these landings for a large proportion of their fishery income, so there would be a high cost for a concentrated group of fishermen if catches were unsustainable.

In addition, there were some additional unquantifiable risks identified by the Whiting PDT which were taken into consideration in the SSC recommendations for silver hake ABCs (see Document 2a in the Appendix). These include but are not limited to a declining relative abundance of large silver hake despite increases in biomass and a large amount of consumption by silver hake predators relative to catch.

This is also the ABC control rule that is proposed for the Secretarial Amendment and is likely to be implemented.

4.1.3 Offshore hake

This measure would increase the silver hake southern stock ABC by 4 percent to account for estimated historic catches of offshore hake and monitor silver and offshore hake together in southern stock area (SSC recommendation). This would increase the 2012-2014 southern silver hake ABC to 33,995 mt.

Rationale: Although sometimes targeted on specific trips, offshore hake are often landed and marketed as silver hake or 'whiting' due to a similarity in appearance and price. Some trips catch more offshore hake on certain tows, but others tows include a mixed catch which is seldom separated from silver hake.

Instead of requiring fishermen to separate catch and dealers to track and report separate landings of offshore hake (sometimes requiring dealers or fishermen to visually estimate the proportion of offshore hake in a trip's landings, or sort and separately weigh large volumes of similarly looking fish), the Council decided to monitor these two species as one species complex in the southern stock area and to increase the southern area whiting (silver and offshore hake) ABC to accommodate the historic average landings of offshore hake, estimated by two catch allocation models evaluated in the benchmark assessment (NEFSC 2011b). By doing so, all other ACL specifications (see the following sections) are adjusted accordingly to account for offshore hake landings.

This is also the ABC control rule that is proposed for the Secretarial Amendment and is likely to be implemented.

4.2 Annual Catch Limits (ACL)

This measure would set the ACLs for all four stocks or stock groups equal to 95 percent of the corresponding ABC (see Table 3) to allow a buffer for management uncertainty.

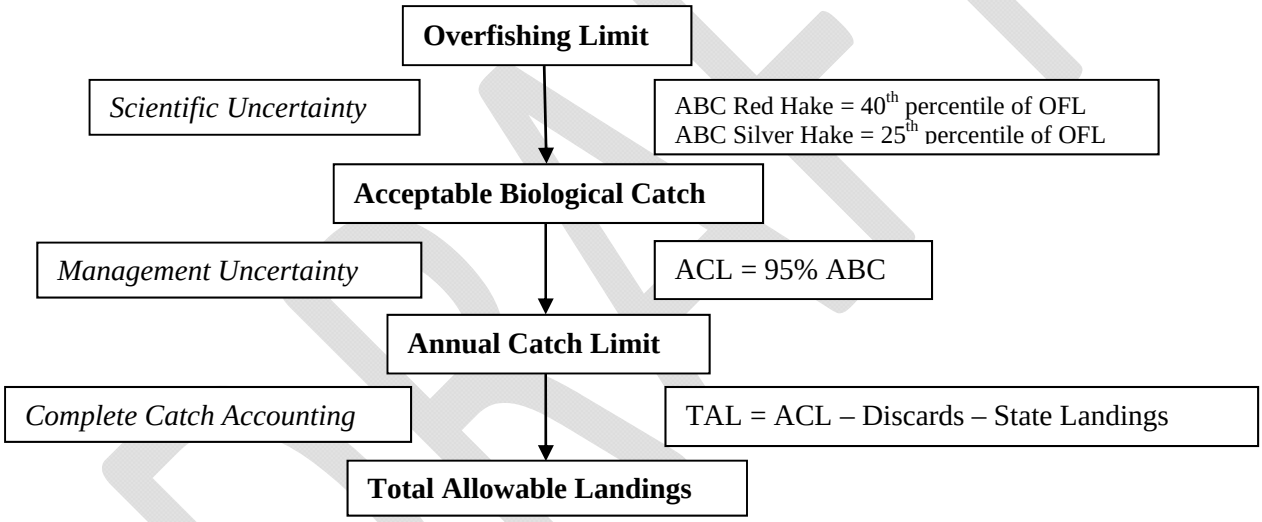
Table 3. 2012-2014 ACLs for small-mesh multispecies stocks.

	Northern Red Hake	Southern Red Hake	Northern Silver Hake	Southern Whiting
ABC	280.1 mt	3,259 mt	13,177 mt	33,995 mt
ACL	266 mt	3,096 mt	12,518 mt	32,295 mt

Table 4. Comparison of Proposed 2012-2014 Northern Area ACLs to recent catch

	Northern Red Hake	Northern Silver Hake
ACL	266.1 mt	12,518 mt
2010 Catch	311 mt	2,478 mt
Difference	-14%	+405%
	Southern Red Hake	Southern Silver Hake
ACL	3096 mt	32,295 mt
2010 Catch	1352 mt	7,110 mt
Difference	+129%	+354%

The ACL framework, including the overfishing limits and ABCs is illustrated below:



Rationale: The fishery is and will be relatively heavily regulated and monitored and with this amendment subject to a post-season accountability measure if catches exceed the ACL. Catches in the fishery have also demonstrated remarkable stability over the last decade or so, related to trip limits, the unique fishing characteristics, limited market demand, and prices. Although some of these factors may change, the Council believes that there is and will be sufficient safeguards that a 5% buffer to account for management uncertainty will be adequate. Setting the ACL at 95% of ABC is also being used for other large mesh groundfish stocks. The Council may revisit this buffer in a future specification if it is found to be inadequate.

This is also the ACL framework that is proposed for the Secretarial Amendment, and is likely to be implemented.

5.0 DESCRIPTION OF MANAGEMENT ALTERNATIVES AND RATIONALE (EA,RFA)

Because of the overlapping nature of Amendment 19 and the Secretarial Amendment, the discussion of a "no action" or "status quo" alternative is complicated. The Secretarial Amendment proposes an ACL framework mechanism, including ABCs, ACLs, stock-area TALs, and a specifications setting process. In addition, the Secretarial Amendment proposes an in-season accountability measure that would implement an incidental possession limit (400 lb for red hake; 1,000 lb for silver hake/whiting) when 90 percent of a TAL is projected to be harvested. A pound-for-pound payback of any ACL overage is proposed by the Secretarial Amendment for a post-season accountability measure. These measures, when they are alternatives below, are considered the "no action/status quo" alternative, even though those measures are currently only "proposed." Amendment 19 proposes to address a number of other management measures that were not addressed in the Secretarial Amendment. In those instances, the regulations that have been in effect for several years are the "no action/status quo" alternatives

5.1 Overfishing definitions

The red and silver hake overfishing definitions were reviewed during the most recent stock assessment (NEFMC 2011). The SAW51 panel recommended and the Council's SSC approved changes to the existing overfishing definitions which would be made by this amendment.

The following two alternatives describe the SAW51 recommended overfishing definitions for the northern and southern stocks of red and silver hake, compared to the previous stock assessment's definitions.

5.1.1 SAW51 recommended overfishing definitions (Preferred Alternative)

New overfishing definitions would apply independently to red and silver hakes in the northern and southern stock areas (Map 2) as follows:

5.1.1.1 Revised red hake overfishing definition

Red hake is overfished when the three-year moving arithmetic average of the spring survey weight per tow (i.e., the biomass threshold) is less than one half of the B_{MSY} proxy, where the B_{MSY} proxy is defined as the average observed from 1980 – 2010. The current estimates of $B_{THRESHOLD}$ for the northern and southern stocks are 1.27 kg/tow and 0.51 kg/tow, respectively.

Overfishing occurs when the ratio between catch and spring survey biomass exceeds 0.163 kt/kg and 3.038 kt/kg, respectively, derived from AIM analyses from 1980-2009.

Rationale: These overfishing definitions were proposed based on new analysis of red hake stock dynamics and was approved by the SAW 51 review panel and recommended for implementation by the Council's SSC. These overfishing definitions include updated survey biomass thresholds, in FRV Albatross units for consistently sampled survey strata.

The Council designated this alternative as preferred because it has been developed through the SAW process, has been peer reviewed, and represents best available science.

5.1.1.2 Revised silver hake overfishing definition

Silver hake is overfished when the three-year moving average of the fall survey weight per tow (i.e. the biomass threshold) is less than one half the B_{MSY} proxy, where the B_{MSY} proxy is defined as the average observed from 1973-1982. The most recent estimates of the biomass thresholds are 3.21 kg/tow for the northern stock and 0.83 kg/tow for the southern stock.

Overfishing occurs when the ratio between the catch and the arithmetic fall survey biomass index from the most recent three years exceeds the overfishing threshold. The most recent estimates of the overfishing threshold are 2.78 kt/kg for the northern stock and 34.19 kt/kg for the southern stock of silver hake.

Rationale: These overfishing definitions were proposed based on new analysis of red hake stock dynamics and was approved by the SAW 51 review panel and recommended for implementation by the Council's SSC. These overfishing definitions include updated survey biomass thresholds, in FRV Albatross units for consistently sampled survey strata.

The Council designated this alternative as preferred because it has been developed through the SAW process, has been peer reviewed, and represents best available science.

5.1.1.3 Offshore hake

Overfishing for offshore hake could not be defined using the available stock assessment information. Indices of abundance and biomass from surveys and commercial catch data were deemed to be unreliable for management.

5.1.2 No action (pre-SAW51 overfishing definition)

The following overfishing definitions would continue to apply:

5.1.2.1 Existing red hake overfishing definition

The southern stock of red hake is in an overfished condition when the three-year moving average weight per individual in the fall survey falls below the 25th percentile of the average weight per individual from the fall survey time series 1963-1997 (0.12) AND when the three-year moving average of the abundance of immature fish less than 25 cm falls below the median value of the 1963-1997 fall survey abundance of fish less than 25 cm (4.72).

5.1.2.2 Existing silver hake overfishing definition

Silver hake is overfished when the three-year moving average of the fall survey weight per tow is less than 3.31 kg/tow and 0.89 kg/tow for the northern and southern stocks respectively, one half of the B_{MSY} proxy (the average observed from 1973 – 1982). If an analytical assessment (e.g. VPA) for silver hake is available, the three-year moving average will be replaced with the terminal year biomass estimate and compared with the mean biomass estimated for 1973 – 1982.

Overfishing occurs when fishing mortality, derived from the latest three years of survey data, exceeds $F_{0.1}$ (0.41 and 0.39 for the northern and southern stocks of silver hake respectively). If an analytical assessment is available, then the terminal year fishing mortality rate will be compared to $F_{0.1}$.

Rationale: There is no rationale to retain the existing overfishing definitions since it would violate guidelines that require using best available science.

5.1.2.3 Offshore hake

No overfishing definition for offshore hake exists.

5.2 Mechanism for Specifying Annual Catch Limit (ACL)

The intent of the ACL is to set a catch limit that will account for management uncertainty. This is the amount of catch that would trigger post season accountability measures if the fishing year catch exceeds the values below. The ACLs would apply to the 2012-2014 fishing years.

The following options are described below:

1. ACL Alternatives
    a. ACLs = 95% of ABC for all ABCs in the small-mesh multispecies fishery
    b. No ACLs
2. Specifications Process Alternatives
    a. Specifications Process, including those measures which may be adjusted in a framework
    b. No specifications process
3. Annual Review Alternatives
    a. Council-led annual reports
    b. NMFS-led annual reports
    c. No Annual Reports

Rationale: The same buffer for management uncertainty and rationale would apply to red and silver hake. Most of the management uncertainty arises from the ability of the management system to control catch and monitor landings, assigning these values to the proper stock area. Since ACL management is in wide use throughout the NE region and this amendment will require improved and more frequent VTR reporting, the Council feels that management uncertainty will be relatively low and a 5% buffer as applied to other groundfish stocks is appropriate. In addition, this amendment proposes in-season accountability measures to halt directed fishing for hakes and impose low incidental possession limits when the landings reach 90% of the TALs, possibly allocated to small mesh management program in the north (Section 5.3.1) and to quarters in the south (Sections 5.5.2 and 5.5.3).

5.2.1 Setting Annual Specifications and Frameworkable Measures

The intent of the specification process is to allow for adjustment of various specifications, including but not limited to ACL specifications and possession limits. These adjustments would respond to changes in resource conditions indexed by the survey and/or estimated by an assessment as well as changes in fishery conditions, such as discarding.

In addition, the amendment would allow for adjustment to new management measures implemented by this amendment in future years using the Council's framework adjustment process.

5.2.1.1 Specification package (Preferred Alternative)

Every three years beginning with the 2015 fishing year, the Council will initiate a specification package that would update the ACL specifications and possibly other measures such as possession limits,

responding to new data and changes in fishery conditions. These specifications and adjusted measures would apply for another three-year specification cycle. Where needed, the Council may also initiate a framework adjustment, responding to information provided in annual monitoring reports.

In the spring of 2014 (and every three years thereafter), the Council would begin the process with the Whiting PDT developing a report on the fishery which provides information to help the Council in its decision-making. The term of reference for the PDT will be to monitor the effectiveness of the management plan and if necessary develop options for changes in specifications or inclusion in a framework adjustment or amendment such that the plan continues to meet the objectives. This report will also provide information and form the basis of the Affected Environment and Impact Analysis sections of a Specifications Package.

Data in this report will include but will not be limited to new survey biomass indices, reported landings, estimated discards. In fishing year 2014 the available data would include survey data for 2011-2013 fall and 2012-2014 spring biomass indices, plus calendar year 2011-2014 landings reports and discard estimates. The report may also include relevant information about recently implemented or developing alternatives in other plans that have or may affect the effectiveness of the existing management measures and specifications. Estimates of OFL, ABC, ACL, and TAL specifications will be provided using the new data.

If the PDT recommends adjustments to the FMP to meet the plan objectives and to respond to new data and fishery conditions, it will make recommendations to the SSC, which will review the PDT's analysis and subsequently advise the Council at its June meeting on potential adjustments to the Small Mesh Multispecies FMP. If the Council agrees that action is required, it will initiate a framework action. Neither a framework action nor specifications process will be needed to apply automatic accountability measures for prior ACL overages.

For a specifications package, the document may be developed and approved by the Council at the summer or early fall Council meeting. Final framework documents would be approved by the Council during the fall meetings and submitted for NMFS review by December 1, so that the proposed and final rulemaking may be completed by the beginning of the fishing year (May 1). In addition to existing management measures that may be adjusted by framework action, the Council may also modify the ACL specifications (OFLs, ABCs, ACLs, TALs), allocations by mesh exemption program and quarter, catch monitoring procedures, the buffer separating the ABC from the OFL and the ACL from the ABC, the TAL triggers, and possession limits to be consistent with the revised specification recommendations and estimates of scientific and management uncertainty.

The Regional Administrator would publish the Councils' recommendation in the *Federal Register* as a proposed rule. The *Federal Register* notification of the proposed action will provide a public comment period in accordance with the Administrative Procedures Act. If the Regional Administrator concurs that the Councils' final recommendation meets the Northeast Multispecies FMP objectives and is consistent with other applicable law, and determines that the recommended management measures should be published as a final rule, the action would be published as a final rule in the *Federal Register*.

If a regulatory action is not implemented to establish new ACLs for the small mesh multispecies fishery for a given year, either through the annual review procedure or triennial specification process, the OFL, ABC, ACL, and TAL specifications in effect during the previous year would remain in effect until new measures are implemented.

In addition to management measures that may already be adjusted by a framework process described in the Northeast Multispecies FMP, the Council may adjust the additional measures listed below. These

framework measures are not considered to be part of a specification process which accommodates new data to set specifications like ABCs, ACLs, TALs, and possession limits.

- OFL and ABC values
- ACLs, TALs, and TAL allocations
- Red, silver, or offshore hake possession limits, including incidental possession limits that may be triggered
- Red and silver hake landings targets for specific small mesh management programs
- Proportions used to allocate landings by area or season
- Changes to reporting requirements and methods to monitor the fishery
- Overfishing definition mortality, biomass proxy values, and the basis for establishing those MSY proxies, including
    - Selected reference time series
    - Survey strata used to calculate biomass indices and reference points
    - The selected survey used for status determination
- Other measures contained within the NE Multispecies that apply to the small mesh multispecies fisheries

Rationale: The proposed process described above would be followed every three years to make necessary adjustments to specifications and measures in the plan. This process would include the development of a new specifications package to make routine adjustments based on new scientific data without following a more cumbersome framework adjustment or amendment development process. Inclusion of these new measures which were implemented by this amendment would give the Council added flexibility to deal with new issues in a timely manner.

The Council designated this alternative as preferred because it follows other successful procedures that the Council uses to develop and adjust specifications.

5.2.1.2 No Action (no specification process – all changes and specifications to be developed through amendments or framework actions, or through a more general process).

No Action would require the Council to develop adjustments to specifications and management measures using the existing framework adjustment and plan amendment process, or using a more general specifications process described in the Secretarial Amendment.

Rationale: Although these processes would take longer to develop and implement, amendments and framework actions allow for a greater amount of public input through official framework meetings or public hearings.

5.2.2 Annual Monitoring Alternatives

5.2.2.1 Annual monitoring report to be prepared and presented to the Council by the Whiting PDT

In addition to the specification process described in Section 5.2.1, the PDT will analyze the data and prepare an annual monitoring report to be presented at the summer Council meeting, or as soon as data from the prior calendar year becomes available to allow estimates of landings, discards, and survey biomass. The PDT may or may not recommend adjustments of management measures, depending on how drastically the indicators have changed since the last Council action. This report will also be used to

determine whether post season accountability measures (Section 5.5) for the next fishing year are necessary.

Rationale: Although the Council may not initiate an action, an annual monitoring report by the PDT would help the Council to decide whether such action is necessary. This process is also described in the Secretarial Amendment and is likely to be approved.

5.2.2.2 Annual landings, discard estimates, and stratified mean survey biomass to be prepared and presented to the Council by NMFS

In addition to the specification process described in Section 5.2.1, NMFS will prepare an annual monitoring report to be presented at the summer Council meeting or when data from the prior calendar year becomes available to allow estimates of landings, discards, and survey biomass. This report will also be used to determine whether post season accountability measures (Section 5.5) for the next fishing year are necessary.

Rationale: The information needed to determine whether accountability measures need to apply is routine and would be sufficient for the Council to determine whether further work is needed by the PDT to develop a management action.

5.2.2.3 Annual landings, discard estimates, and stratified mean survey biomass to be prepared and presented to the Council by NMFS (Preferred Alternative)

Annually when data become available for analysis, NMFS would prepare a report summarizing the trends in the fishery and changes in stock biomass. NMFS would present this information to the Whiting PDT, which would review such information and advise the Council. Unlike the process in Section 5.2.2.1, NMFS would be responsible for preparing the summarized data, but the Whiting PDT will still be charged with reviewing the data and providing advice. This report will also be used to determine whether post season accountability measures (Section 5.5) for the next fishing year are necessary.

Rationale: Although requiring action at one or more meetings by the Whiting PDT, this alternative would require NMFS to prepare the relevant data summaries which would be reviewed by the Whiting PDT and reported to the Council.

The Council designated this alternative as preferred because it clearly assigns responsibilities as needed, without obligating the Council's PDT to a heavy workload. This process is used for other Council FMP monitoring processes and has worked well.

5.2.2.4 No Action

The Council would conduct periodic reviews as necessary to prepare management actions, either amendments or framework adjustments. Alternatively, an annual monitoring report will be prepared as described in the Secretarial Amendment to be approved and implemented.

Rationale: This alternative would rely on NMFS to determine whether post-season AMs would be triggered, without a formal report being made to the Council. Adjustments to specifications would be considered every three years and the Council could initiate a framework adjustment or develop a new amendment at any time in response to new issues that are brought to the Council's attention.

5.3 Northern Stock Area Total Allowable Landings (TAL) Alternatives

Red and silver hake TALs are proposed for the northern stock area to reduce the risk that fishing effort targeting these species may increase, causing catches to exceed the ACLs. The intent of a stock wide TAL for each species is to account for expected discards and state water landings. Incidental possession limits would be triggered at 90% of the TAL to put a brake on the fishery and reduce catches, with the intention that landings should not exceed the TAL. This alternative is the same as the one proposed for the Secretarial Amendment and is therefore considered as No Action.

Small mesh exemption area silver hake and red hake landings targets are also proposed. Unlike the stock wide TAL, the exemption area landings targets are mainly proposed to establish an in-season AM trigger at 90% of the landings target. The intent of this measure is to discourage fishing on a species approaching the landings target, reducing the risk that the stock wide TAL trigger would be met. It could prevent the directed small mesh fishery from affecting fishing by vessels targeting other species and landing some red and silver hake as an incidental catch in the northern stock area.

The following alternatives are described below. They are not mutually exclusive and the Council may select a stock wide TAL, or a stock wide TAL with exemption area landings targets. The Council may or may not also select a roll-over provision for unlanded amounts in the Cultivator Shoals Area to make those pounds available in other small mesh exemption areas that remain open later in the fishing year.

1. Stock wide TALs (No Action)
2. Silver and red hake TAL specifications that are derived from the ACL and account for expected discards and state water landings
3. Exemption area landings targets for the Cultivator Shoals Area and the five small mesh exemption area programs
4. A rollover provision for unlanded amounts allocated to the Cultivator Shoals Area, which would make unlanded pounds available in the other inshore small mesh areas

5.3.1 Stock-wide TAL (No Action; Preferred Alternative)

This alternative would establish a stock area-wide TAL for red and silver hake, individually.

The Council has recommended setting the discard rate equal to the most recent three-year average. For the 2012-2014 specifications, discards in the northern stock area as a proportion of total catch were 65% for red hake and 26% for silver hake (see Section 7.1.3.???). Discard mortality assumed in the benchmark assessment and used to establish the ABCs was 100% for all gear types. The Whiting PDT may propose and the Council's SSC may approve variations in this procedure for future specifications, if there is good cause for expecting a change in discard rates due to regulatory changes or other causes.

The Council recommended that most recent three-year period to estimate discards because it is most reflective of probable conditions in the next specification cycle. An assumption about future discard mortality is needed to set future specifications, since many of the accountability measures rely on real-time monitoring of landings, instead of more costly real-time monitoring of discards and total catch.

The Council has recommended using an estimate of three percent to account for the landings of small-mesh multispecies by vessels without Federal permits (i.e., state landings). The Council may change this assumption for future specifications as the fishery adjusts to ACL management and new data are collected. Landings by vessels without Federal fishing permits and fishing exclusively in state waters cannot under normal circumstances be regulated by a Federal fishery management plan. Therefore, state

waters catches cannot be limited by Federal regulations under this amendment, but still contribute to total stock removals which can cause overfishing, if not taken into account. The ABCs chosen by the Council to prevent overfishing are based on all catches, regardless of source or location. The Council and NMFS rely on cooperation with states to regulate state waters catches when needed to achieve shared conservation objectives, the most parsimonious approach is to assume that state water catches will remain nearly constant, unless there is some external reason to expect changes.

During much of the recent red and silver hake landings history (see Section 7.1.3), state water landings have remained relatively low, close to 3 percent of total landings. The Council accepted this level as a reasonable expectation of future state water landings and reduced the Federal TALs accordingly.

Table 5. 2012-2014 Northern Area TALs

	Northern Red Hake	**Northern Silver Hake**
ACL	266.1 mt	12,518 mt
2008-2010 Discard Rate	65%	26%
Estimated Discards	173.0 mt	3,267 mt
State Landings Rate	3%	3%
State Landings Estimate	2.8 mt	278 mt
Federal TAL	90.3 mt	8,973 mt

Table 6. Comparison of Proposed Northern Area TALs to recent landings

	Northern Red Hake	**Northern Silver Hake**
Proposed Federal TAL	90.3 mt	8,973 mt
2009 Landings	92 mt	1,031 mt
Difference	-2%	+770%
2010 Landings	69 mt	1,639 mt
Difference	+31%	+447%

Rationale: This alternative is included in the Secretarial Amendment, and is likely to be implemented.

The Council designated this alternative as preferred because it would be less costly to monitor and the small mesh exemption area targets may not provide the expected benefits, reducing the impact on fishing targeting other species in the northern stock area.

5.3.2 Small Mesh Exemption Area Landings Silver Hake Targets

If the Council approves this alternative, Amendment 19 would establish separate landings targets for silver hake for the Cultivator Shoals Exemption Area Program and the inshore Gulf of Maine small-mesh exemption area programs (the Raised Footrope Trawl Exemption Area near Cape Cod, Small Mesh Area I, Small Mesh Area II, and the Gulf of Maine Raised Footrope Trawl Area along the coast of Maine). These calculations would start with the Federal TAL described in Section 5.3.1, but would further divide that TAL by the 2004-2010 landings proportions, described in Table 7. The remainder of the TAL and any of the landings not made by fishing in the small mesh programs (i.e. the directed fishery in the northern stock area) would be available for incidental landings by vessels not fishing in one of the small mesh exemption programs.

Silver hake landings by vessels fishing in the small-mesh exemption programs would be monitored based on VTRs and dealer reports. It is intended that this measure would work with the in-season accountability

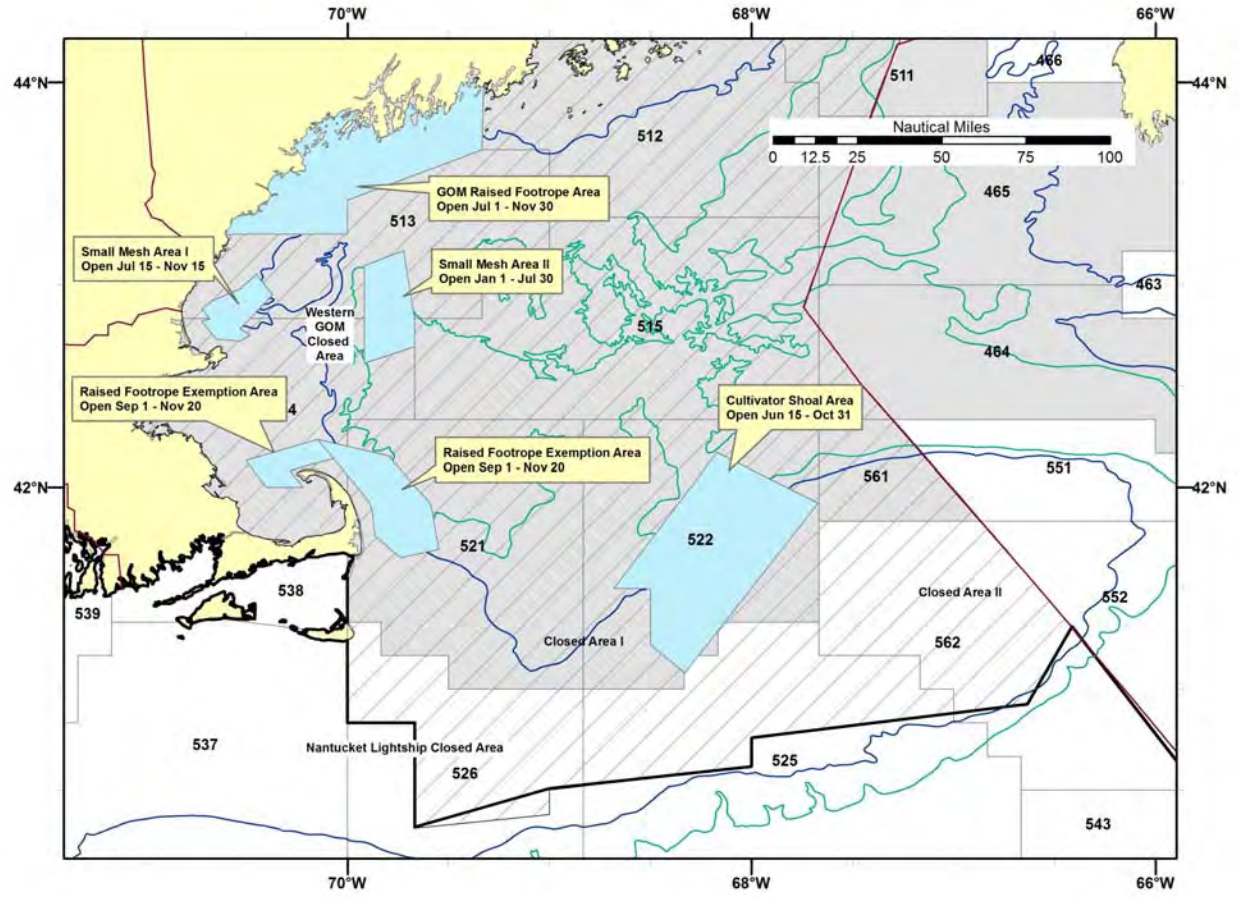
measure described in Section 5.4, which would reduce the possession limit to an incidental level when a trigger point is reached, as well as the alternative to require weekly VTRs by vessels landing small mesh multispecies. Vessels using small mesh to target silver hake, red hake, or shrimp would count toward the small mesh area program allocations. Silver hake landings by vessels using other gears, large mesh trawls, or targeting herring with mid-water trawls or pelagic purse seines (as defined in 50 CFR §648.2 and as regulated in 50 CFR §648.80(d) and 50 CFR §648.80(e)) would count toward the northern stock silver hake TAL regardless of where fishing occurred in the northern stock area.

VTR data from 2004 to 2010 would be used as the basis for allocating these landing targets by exemption program. According to this data for silver hake, 50.9% of landings were derived from the Cultivator Shoals Area and 34.6% from the other small mesh exemption areas[3]. These percentages would apply to the 2012-2014 fishing years (see table below) and future specifications.

Rationale: Because the small-mesh exemption programs serve different fleets, this measure would allow traditional vessels to catch and land silver hake in amounts consistent with their historic participation in the fishery since the small-mesh exemption programs were established. The Council's intention for this measure is for the landings allocations to serve as targets and to establish a level where directed fishing would be curtailed or temporarily close that small-mesh exemption program until the next fishing year.

[3] The remaining 14.5% of 2004-2010 landing were caught elsewhere in the Gulf of Maine by vessels not participating in a small-mesh exemption program.

Map 3. Small mesh area programs (labeled) with areas closed to all mobile gear fishing in the Gulf of Maine/northern stock area. The larger hatched area is the Gulf of Maine exemption area. Catches from the shaded statistical areas are attributed to the northern stock area, consistent with the small mesh multispecies stock assessments.



5.3.3 Exemption Area Red Hake Landings Targets

If the Council approves this alternative, Amendment 19 would establish separate red hake landings targets for the Cultivator Shoals Exemption Area Program and the inshore Gulf of Maine small-mesh exemption programs (the Raised Footrope Trawl Exemption Area near Cape Cod, Small Mesh Area I, Small Mesh Area II, and the Gulf of Maine Raised Footrope Trawl Area along the coast of Maine). These calculations would start with the Federal TAL described in Section 5.3.1, but would further divide that TAL by the 2004-2010 landings proportions (Table 7). The remainder of the TAL and any of the landings not made by fishing in the small mesh programs would be available for incidental landings by vessels not fishing in one of the small-mesh exemption programs.

Red hake landings by vessels fishing in the small mesh exemption programs would be monitored based on weekly VTRs and dealer reports (Section 5.8.1). It is intended that this measure would work with the in-season accountability measure described in Section 5.4, which would reduce the possession limit to an incidental level when a trigger point is reached. Vessels using small mesh to target silver hake, red hake, or shrimp would count toward the small-mesh area program allocations. Red hake landings by vessels using other gears, large mesh trawls, or targeting herring with mid-water trawls or pelagic purse seines (as

defined in 50 CFR §648.2 and as regulated in 50 CFR §648.80(d) and 50 CFR §648.80(e)) would count toward the northern stock red hake TAL regardless of where fishing occurred in the northern stock area.

VTR data from 2004 to 2010 would be used as the basis for allocating the landings targets by program. According to this data for red hake, 18.0% of landings were derived from the Cultivator Shoals Area, 56.7% from the other small mesh exemption areas[4]. These percentages would apply to the 2012-2014 fishing years (see table below) and future specifications.

Rationale: Because the small-mesh exemption programs serve different fleets, this measure would reduce the potential that red hake catches and landings in the Cultivator Shoals Exemption Area Program would curtail access to the small-mesh fisheries in the other small-mesh exemption programs in the Gulf of Maine. This may be very important because the proposed ABCs for the northern stock of red hake are less than recent catches. Because red hake landings have lower value and the ABC is less than silver hake, this measure could prevent Cultivator Shoals Exemption Area Program landings of red hake from preventing access to silver hake and red hake in other inshore small-mesh programs.

Table 7. Proposed 2012-2014 small-mesh program area landings targets of red and silver hake in the northern stock area.

		Red hake	Silver hake
Total northern stock area TAL (mt)		90.3	8973
Cultivator Shoals Exemption Area Program landings targets	Percent allocation	18.0%	50.9%
	2012-2014 Target (mt)	16.3	4567
Inshore Gulf of Maine Exemption Area Programs landings targets	Percent allocation	56.7%	34.6%
	2012-2014 Target (mt)	51.2	3105

5.3.4 Cultivator Shoals Exemption Area Program Roll-Over Provision Alternatives

If the Council chooses one of the above alternatives that would sub-divide the stock-area TALs of for silver hake, red hake, or both, into the exemption area programs, the Council must choose between one of the following alternatives:

1. Cultivator Shoals Exemption Area Program Landing Target Roll-Over

2. No Cultivator Shoals Exemption Area Program Landing Target Roll-Over

5.3.4.1 Cultivator Shoals Exemption Area Program Landing Target Roll-Over

The Cultivator Shoals Exemption Area Program opens on June 15 and closes on October 31 of each year, proceeding at least some of the open seasons for the other small-mesh exemption programs in the Gulf of Maine. Red and/or silver hake landings which have not been made at the end of the Cultivator Shoals Exemption Area season (i.e., if landings are less than the Cultivator Shoals Exemption Area Program landing target) would be re-allocated during the fishing year to the other small-mesh exemption area

[4] The remaining 25.3% of 2004-2010 landing were caught elsewhere in the Gulf of Maine or by vessels not using small mesh gear to target shrimp, red hake, or silver hake.

program landing target. This in-season re-allocation may allow a re-opening of the other small mesh area programs, if their landings have already exceeded the in-season accountability measure triggers by increasing the possession limit from an incidental level (Section 5.4.3) to the normal year around possession limit for red hake (if applicable; see Section **Error! Reference source not found.**)) or silver hake.

For example, if vessels in the Cultivator Shoals Exemption Area Program land 15 mt (of the available 19.5 mt) of red hake and 2,800 mt (of the available 4,635 mt) of silver hake by October 31, the Regional Administrator would increase the landings targets for the other small-mesh exemption area program's landing target by 4.5 mt and 1,835 mt, respectively.

Rationale: The re-allocation of potential landings from the Cultivator Shoals Exemption Area Program would increase the availability of fish to the vessels participating in the inshore small-mesh exemption area programs, increasing the potential that optimum yield would be achieved, without exceeding the ACLs for the northern stock area.

5.3.4.2 No Cultivator Shoals Exemption Area Target Roll-Over Provision

This alternative would not implement a roll-over of unused landings from the Cultivator Shoals Exemption Area Program to the Inshore Gulf of Maine Exemption Area Programs landing target, if a sub-divided TAL is selected by the Council. This alternative may result in some landings of either red or silver hake not being available for the directed, small-mesh fishery. The potential remains that those landings could be taken incidentally in other fisheries throughout the northern stock area, however.

5.4 Northern stock area in-season accountability measures

The intent of in-season accountability measures is to limit landings and discourage trips targeting red, silver, and offshore hake when landings reach 90% of the TAL to reduce the risk that catches will exceed the northern stock area TALs.

In Section 5.4.3, the Council additionally proposes management alternatives that would apply to fishing in the small mesh area programs for red and/or silver hake to prevent the landings in those areas from affecting fishing opportunity in other parts of the northern stock area.

The following alternatives are described below:

1. Incidental possession limits for red hake when landings reach a TAL trigger with alternatives for 200, 300, and 400 lbs.
2. Incidental possession limits for silver hake when landings reach a TAL trigger with alternatives for 500, 1000, and 2000 lbs.
3. Small mesh area program incidental limits
    a. Incidental possession limits for red hake when landings reach a landings target trigger with alternatives for 200, 300, and 400 lbs.
    b. No small mesh are incidental limits
4. No in-season accountability measures
5. No Action – a stock wide in-season AM to be chosen for the Secretarial Amendment

5.4.1 Red hake incidental possession limits for the northern stock area

One of the following possession limits would be automatically triggered when northern stock area red hake landings reach 90% of the TAL and the Regional Administrator determines that without taking action landings would exceed the TAL for that stock by the end of the fishing year. If the Council chooses different red hake possession limits for the northern and southern stock areas and the vessel fishes in both the Gulf of Maine/Georges Bank (Map 3) and Southern New England or Mid-Atlantic exemption areas (Map 4) during a trip, the lower of the stock area possession limits will apply to that trip. These limits would be implemented by Notice Action and would remain in place until the end of the fishing year.

5.4.1.1 200 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 200 lbs. of whole or whole weight equivalent of red hake may be retained on board vessels fishing in the Gulf of Maine exemption area (see Map 3). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This incidental limit would discourage vessels from targeting red hake and encourage vessels to fish in other areas where red hake are less abundant. Out of the options examined by the PDT, this alternative was determined to be the most effective at discouraging vessels from targeting red hake, but would increase discards more than the other alternatives, particularly for vessels that target silver hake with small mesh trawls.

5.4.1.2 300 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 300 lbs. of whole or whole weight equivalent of red hake may be retained on board vessels fishing in the Gulf of Maine exemption area (see Map 3). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting red hake and encourage vessels to fish in other areas where red hake are less abundant, but would be less effective than the above alternative and more effective than the alternative below. Compared to the expected behavior for the alternative above, some vessels fishing inshore on day trips may continue to target red hake, particularly to be sold as bait, and vessels targeting silver hake may have less incentive to avoid catching red hake.

On the other hand, this alternative would increase discards less than the above alternative because more trips would be unaffected by the higher incidental possession limit.

5.4.1.3 400 pounds of whole landings, no more than one landing in a calendar day (Preferred Alternative)

When triggered by the process described above, no more than 400 lbs. of whole or whole weight equivalent of red hake may be retained on board vessels fishing in the Gulf of Maine exemption area (see Map 3). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting red hake and encourage vessels to fish in other areas where red hake are less abundant, but would be less effective than either of the above alternatives. Compared to the expected behavior for the two alternatives above, some vessels fishing inshore on day trips may continue to target red hake, particularly to be sold as bait, and vessels targeting silver hake may have less incentive to avoid catching red hake.

On the other hand, this alternative would increase discards less than the other alternatives because more trips would be unaffected by the higher incidental possession limit.

N.B. This alternative is being proposed as part of the Secretarial Amendment.

The Council designated this alternative as preferred because analysis by the Whiting PDT indicates that it is likely to be effective in keeping landings (and induced discards) below the TAL. There isn't a meaningful contrast in the effectiveness of lower incidental possession limits, but a 200 lbs. possession limit is estimated to cause an unacceptable increase in discards.

5.4.2 Silver hake incidental possession limits for the northern stock area

One of the following possession limits would be automatically triggered when northern stock area silver hake landings reach 90% of the TAL and the Regional Administrator determines that without taking action landings would exceed the TAL for that stock by the end of the fishing year. If the Council chooses different red hake possession limits for the northern and southern stock areas and the vessel fishes in both the Gulf of Maine/Georges Bank (Map 3) and Southern New England or Mid-Atlantic exemption areas (Map 4) during a trip, the lower of the stock area possession limits will apply to that trip. These limits would be implemented by Notice Action and would remain in place until the end of the fishing year.

5.4.2.1 500 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 500 lbs. of whole or whole weight equivalent of silver hake may be retained on board vessels fishing in the northern stock area (see Map 3). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This incidental limit would discourage vessels from targeting silver hake and encourage vessels to fish in other areas where silver hake are less abundant, stop fishing, or target other species with different gear. Since vessels that land more than this amount of silver hake are typically using small mesh trawls to target the species, many vessels would stop fishing for silver hake.

Out of the options examined by the PDT, this alternative was determined to be the most effective at discouraging vessels from targeting silver hake, but would increase discards more than the other alternatives, particularly for vessels that fish for other species using large mesh trawls and catch larger quantities of silver hake.

5.4.2.2 1000 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 1000 lbs. of whole or whole weight equivalent of silver hake may be retained on board vessels fishing in the northern stock area (see Map 3). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting silver hake and encourage vessels to fish in other areas where silver hake are less abundant, but would be less effective than the above alternative and more effective than the alternative below. Compared to the expected behavior for the alternative above, some vessels fishing inshore on day trips may continue to target silver hake, particularly to be sold as bait or food, and vessels targeting other species may have less incentive to avoid catching silver hake.

On the other hand, this alternative would increase discards less than the above alternative because more trips would be unaffected by the higher incidental possession limit.

N.B. This alternative is being proposed as part of the Secretarial Amendment.

5.4.2.3 2000 pounds of whole landings, no more than one landing in a calendar day (Preferred Alternative)

When triggered by the process described above, no more than 2000 lbs. of whole or whole weight equivalent of silver hake may be retained on board vessels fishing in the northern stock area (see Map 3). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting silver hake and encourage vessels to fish in other areas where silver hake are less abundant, but would be less effective than either of the above alternatives. Compared to the expected behavior for the two alternatives above, some vessels fishing inshore on day trips may continue to target silver hake, particularly to be sold as bait or food, and vessels targeting other species may have less incentive to avoid catching silver hake.

On the other hand, this alternative would increase discards less than the other alternatives because more trips would be unaffected by the higher incidental possession limit.

The Council designated this alternative as preferred because analysis by the Whiting PDT indicates that it is likely to be effective in keeping landings (and induced discards) below the TAL. There isn't a meaningful contrast in the effectiveness of lower incidental possession limits, but a 500 lbs. possession limit is estimated to cause an unacceptable increase in discards.

5.4.3 Red hake incidental possession limits for the Cultivator Shoals Area and other Small Mesh Area Programs

The intent of the special accountability measures for Cultivator Shoals Area and the other Small Mesh Area Programs is to prevent excessive landings from these programs from affecting the opportunity fish in areas that open later in the fishing year and to avoid higher discards that could occur if the northern stock area landings reach 90% of the TALs. At this time, the Council proposes that this alternative only apply to red hake landings because a) the recent red hake catches are closer to or exceed the proposed ACL and b) vessels fishing for silver hake with small mesh trawls are often able to avoid catching red hake by fishing in different depth ranges. Because the recent silver hake catches are a relatively small fraction of the proposed ACL, exceeding the silver hake landings target in Cultivator Shoals Area or in the other Small Mesh Area Programs would be unlikely to cause silver hake catches to exceed the ACL for the northern stock area.

5.4.3.1 Reduce red hake possession limit an incidental level for vessels fishing in Small Mesh Area Programs

When landings of red hake reach 90% of the landings targets for the small mesh area programs (Sections 5.3.2 and 5.3.3), the Regional Administrator will reduce the red hake possession limit to an incidental limit (Section 5.3.1), regardless of timing. The Council may select a different incidental limit of 200, 300, or 400 lbs. to apply to vessels fishing in the small mesh area programs than the one chosen for the northern stock area (Section 5.4.1).

Rationale: The recent red hake landings are at or slightly above the proposed northern stock area TAL, so red hake landings in one area may affect the opportunity to fish with small mesh in other areas and/or cause discarding in fisheries targeting other species with small or large mesh trawls. Industry advisors report that depending on existing conditions, they are able to fish in the small mesh area programs to target silver hake while catching relatively few red hake by exercising more selective fishing behavior (for example fishing in specific depths). Consequently, limiting red hake landings when they reach the small mesh area landings targets (Sections 5.3.2 and 5.3.3) could allow more opportunity to fish for silver hake while limiting discarding in fisheries using small and large mesh trawls to target groundfish, herring, shrimp, and other species.

5.4.3.2 No small mesh management program accountability measures (No Action)

No action would mean that there would be no special in-season accountability measures for the small mesh area program fishing. Incidental possession limits would only apply when triggered for the northern stock area. Thus landings of red or silver hake from the small mesh areas could exceed the landings targets for each program (see Sections 5.3.2 and 5.3.3). If the landings from one area reached all or most of the stock area TALs, one program could affect the opportunity to fish in another area if it triggered stock area incidental limits (Section 5.3.1).

Rationale: In-season accountability measures for small mesh programs could increase discarding in one program even though landings from other areas (which are open to fishing later in the fishing year) might be well under their targets and the stock wide landings are safely below the stock area TAL trigger.

5.4.4 No in-season accountability measures[5]

This alternative proposes no incidental possession limits for either red or silver hake in the northern stock area. Year around possession limits (which currently exist for silver hake and are proposed in Section 5.7.1 for red hake) would remain in place throughout the fishing year, regardless of whether or not landings exceed the TALs.

Rationale: The MSA does not require in-season accountability measures if post-season accountability measures exist. This alternative would rely entirely on post-season accountability measures (Section 5.5) to prevent overfishing. In-season accountability measures may be unnecessary at this time, particularly for stocks where catches have been significantly below the ACLs. The Council could develop and implement in-season accountability measures later if needed through an amendment or framework action, but doing so would take time and would be unavailable during a fishing year when catches first exceed the ACLs. This alternative would thus be more risky or carry substantial costs (by limiting fishing in future years as a payback for prior overages) compared to alternatives with in-season accountability measures.

5.4.5 No Action

This alternative will make no changes to the in-season accountability measures that may be included in the Secretarial Amendment to curtail landings and catch when the former approaches the TAL. The Secretarial Amendment is proposing a 400 lbs. incidental red hake possession limit and a 2000 lbs. incidental silver hake possession limit.

[5] This alternative is not equivalent to No Action, because the Council expects that the Secretarial Amendment will include some form of northern stock area in-season accountability measures.

Rationale: This measure is likely to be approved and implemented in the Secretarial Amendment. If one of the above alternatives is chosen it might be implemented mid-season after an accountability measure has already gone into effect.

5.5 Southern Stock Area TAL Alternatives

Red and silver hake TALs are proposed for the southern stock area to reduce the risk that fishing effort targeting these species may increase, causing catches to exceed the ACLs. Landings of offshore hake would monitored and count toward the silver hake TAL, which has been adjusted accordingly based on historic landings. The intent of a stock wide TAL for each species is to account for expected discards and state water landings. Incidental possession limits would be triggered at 90% of the TAL to put a brake on the fishery and reduce catches, with the intention that landings should not exceed the TAL. This alternative is the same as the one proposed for the Secretarial Amendment and is therefore considered as No Action.

Beginning at the start of the fishing year on May 1, quarterly silver hake and red hake landings targets are also proposed. The intent of these quarterly TALs is to prevent landings from occurring quickly, causing a closure for an extended period until the end of the fishing year. The quarterly allocations are based on historic landings patterns. Overages or underages would by carried forward into future quarters, using one of the two alternative methods described below.

The following alternatives are described below. The Council may choose the stock wide TAL with or without (triggered or permanent) quarterly allocations. If one of the quarterly allocation alternatives are selected, one of the roll over provisions may also be selected.

1. Stock wide TALs for red and silver/offshore hakes (No Action)
2. Quarterly TALs triggered when landings are above 2/3rds of the proposed TAL specifications
3. Quarterly TALs
4. TAL rollover provisions
    a. A quarterly adjustment process
    b. Roll up TALs – landings monitored against a cumulative quarterly TAL
    c. No rollover provisions

5.5.1 Stock-wide annual TAL (No Action)

This alternative would establish a stock area-wide TAL for red and silver hake, individually.

The Council has recommended setting the discard rate equal to the most recent three year average. For the 2012-2014 specifications, discards in the southern stock area as a proportion of total catch were 56% for red hake and 13% for silver hake (see Section 7.1.3.???). Discard mortality assumed in the benchmark assessment and used to establish the ABCs was 100% for all gear types. The Whiting PDT may propose and the Council's SSC may approve variations in this procedure for future specifications, if there is good cause for expecting a change in discard rates due to regulatory or other causes. The most recent three year period is most reflective of probable conditions in the next specification cycle. An assumption about future discard mortality is needed to set future specifications, since many of the accountability measures rely on real-time monitoring of landings, instead of more costly real-time monitoring of discards and total catch.

The Council has recommended using an estimate of 3 percent to account for the landings of small-mesh multispecies by vessels without Federal permits (i.e., state landings). The Council may change this

assumption for future specifications as the fishery adjusts to ACL management and new data are collected. Landings and catches by vessels without Federal fishing permits and fishing exclusively in state waters cannot under normal circumstances be regulated by a Federal fishery management plan. Therefore state waters catches cannot be limited by Federal regulations under this amendment, but still contribute to total stock removals which can cause overfishing if not taken into account. The ABCs chosen by the Council to prevent overfishing are based on all catches, regardless of source or location. Because the Council and NMFS rely on cooperation with states to regulate state waters catches when needed to achieve shared conservation objectives, the most parsimonious approach is to assume that state water catches will remain nearly constant, unless there is some external reason to expect changes.

During much of the recent red and silver hake landings history (see Section 7.1.2), state water landings have remained relatively low, close to 3 percent of total landings. The Council accepted this level as a reasonable expectation of future state water landings and reduced the Federal TALs accordingly.

This alternative is the status quo, if the Secretarial Amendment is implemented as proposed.

Table 8 2012-2014 Southern Area TALs

	Southern Red Hake	Southern Whiting
ACL	3,096 mt	32,295 mt
2008-2010 Discard Rate	56%	13%
Assumed Discards	1,718 mt	4,198 mt
State Landings Rate	3%	3%
Assumed State Water Landings	42 mt	84 mt
Federal TAL	1,336 mt	27,255 mt

Table 9 Comparison of Proposed Southern Area TALs to recent landings

	Southern Red Hake	Southern Whiting
Proposed Federal TAL	1,336 mt	27,255 mt
2009 Landings	675 mt	6,606 mt
Difference	+98%	+313%
2010 Landings	616 mt	6,330 mt
Difference	+117%	+331%

5.5.2 Quarterly fishing year TAL allocations

This alternative would divide the stock-area TAL, as described above, into quarterly TALs. The quarterly TAL allocations would be allocated in the average proportion of landings from 2008-2010. These proportions estimated by the Whiting PDT from dealer reported landings of red, silver, and offshore hake are given in the table below, along with the initial sub-TAL specifications for fishing years 2012-2014.

Table 10. Quarterly TAL allocations and initial specifications for the southern stock area.

		May - Jul	*Aug - Oct*	*Nov - Jan*	*Feb - Apr*
Southern red hake	Proportional allocations	33.30%	25.30%	17.70%	23.70%
	2012-2014 specifications (mt)	445	338	237	317
	Cumulative (mt)	445	783	1020	1336
Southern Whiting	Proportional allocations	27.00%	21.40%	22.80%	28.80%
	2012-2014 specifications (mt)	7359	5832	6214	7849
	Cumulative (mt)	7359	13191	19405	27254

Rationale: Quarterly allocations would ensure that opportunities to target the small-mesh multispecies would be available in proportion to historic landings and also provide the market with a steadier supply of small-mesh multispecies compared to a single annual allocation. Roll-over and make-up provisions would provide some adaptability to market, biological, or regulatory change.

5.5.3 Quarterly fishing year TAL allocations, triggered when prior landings exceed ⅔rds of the TAL (Preferred Alternative)

This alternative would implement the above described quarterly TALs when the landings in the previous year were two-thirds or more of the annual, stock-area TAL.

For example, if the fishing year 2012 red hake landings were 800 mt (74% of the 1,081 mt TAL), the quarterly red hake TAL allocations would be implemented for the 2014 fishing year, beginning on May 1, 2014. If the 2012 landings of silver and offshore hake were less than 2/3rds of the fishing year 2014 southern whiting TAL, there would be no quarterly allocation of silver/offshore hakes, even though red hake quarterly allocations had been triggered (and vice versa).

Rationale: The quarterly allocations are really unnecessary until landings begin to approach the TALs in future years, but this alternative would not take effect in the current year if landings reach the trigger. Consequently, increases in landings could cause a prolonged closure until the next fishing year when quarterly allocations began. Roll-over and make-up provisions would provide some adaptability to market, biological, or regulatory change.

The Council designated this alternative as preferred because it was recommended by the Advisory Panel to prevent long directed fishery closures, possibly affecting the ability to target whiting in the winter and spring. The quarterly allocations would spread fishing out more evenly throughout the year. This alternative would also implement quarterly allocations only when needed, if and when the landings approach the TALs, without requiring further Council action.

5.5.4 TAL roll over provisions

If there are quarterly allocation of TAL as presented in Section 4.7.1.4, which would be implemented when Amendment 19 becomes effective, or Section 4.7.1.5, which would be implemented when landings of either red or silver and offshore hake exceed 2/3rds of the TAL specification in the next fishing year, the Council intends that unlanded TAL may be carried over to a future quarter within the fishing year, and

overages should be deducted. Two alternatives methods for allowing roll overs and accounting for quarterly overages are presented below.

5.5.4.1 Quarterly TAL adjustments

Unlanded amounts from the May-Jul (1st) quarter would be added to the allocation for the Nov-Jan (3rd) quarter. Unlanded amounts from the Aug-Oct (2nd) and Nov-Jan (3rd) quarters would be added to the allocation for the Feb-Apr (4th) quarter. All overages of quarterly TALs would be deduced from the fourth fishing year quarter.

Rationale: This alternative accounts for overages only at the end of the year. TAL triggers only increase in quarter 3 and remain unchanged in quarter 2. Thus the allowable landings in each quarter is more stable than the alternative below, except for quarter 4 when the in-season AM would be adjusted to account for prior overages if any occurred. This alternative could result in a longer closure period in quarter 4 (Feb-Apr) than might occur than for the procedure described in the alternative below.

5.5.4.2 Roll up TALs and triggers (Preferred Alternative)

Instead of a formal in-season adjustment mechanism described in the above alternative, landings would be monitored against cumulative quarterly TALs and AM triggers. In other words, the landings from quarter 1 (May-Jul) would be monitored and compared with the quarter 1 TAL and trigger. Cumulative landings for all of quarter 1 (even if an AM was triggered) and for quarter 2 would be monitored and compared to the sum of the quarter 1 and quarter 2 TALs and AMs. In quarter 3, cumulative landings since the start of the fishing year would be monitored and compared to the sum of the quarter 1, 2, and 3 TALs and triggers. And in quarter 4, the cumulative annual landings to date would be monitored and compared with the annual TALs and AM triggers. The table below gives an example.

Table 11. Example monitoring and adjustment of cumulative quarterly TALs.

Quarter	Cumulative TAL (mt)	TAL trigger (mt)	Cumulative landings (mt)	AM triggered
1 (May-Jul)	30	27	27	No
2 (May-Oct)	60	54	59	Yes
3 (May-Jan)	80	72	83	Yes
4 (annual)	100	90	95	Yes, but TAL not exceeded

Rationale: Any unlanded TALs could be taken in the next or future quarters in the fishing year, without a formal adjustment mechanism. Thus, the system would be easier than the alternative to monitor, manage, and understand.

The Council designated this alternative as preferred because it would be simpler to monitor and understand, yet provide most of the same benefits of a more structured approach that accounts for overages only at the end of the fishing year. Unlanded amounts in quarter 1 could be taken in quarter 2, unlike an alternative that requires publication of a Notice Action to make quarterly adjustments to the quarter after next, i.e. adjustments to quarter 3 allocations to account for unlanded amounts in quarter 1.

5.5.4.3 No roll over provisions

The quarterly allocations may be chosen in the final alternative with no provisions for roll over of underages or overages. In this case, any overages of the quarterly TALs would accrue and count against the stock wide TALs.

Rationale: Accounting and making frequent adjustment to quarterly allocations may be an unnecessary complication. All overages would accrue in the fourth quarter anyway in determining whether a stock wide TAL trigger had been met.

5.6 Southern stock area in-season accountability measures

The intent of in-season accountability measures is to limit landings and discourage trips targeting red, silver, and offshore hake when landings reach 90% of the TAL to reduce the risk that catches will exceed the southern stock area annual and/or quarterly TALs. If quarterly TAL specifications exist or have been triggered the incidental limits will apply for the remainder of the quarter. These accountability measures would apply on a fishing year or fishing year quarterly basis, whichever is applicable.

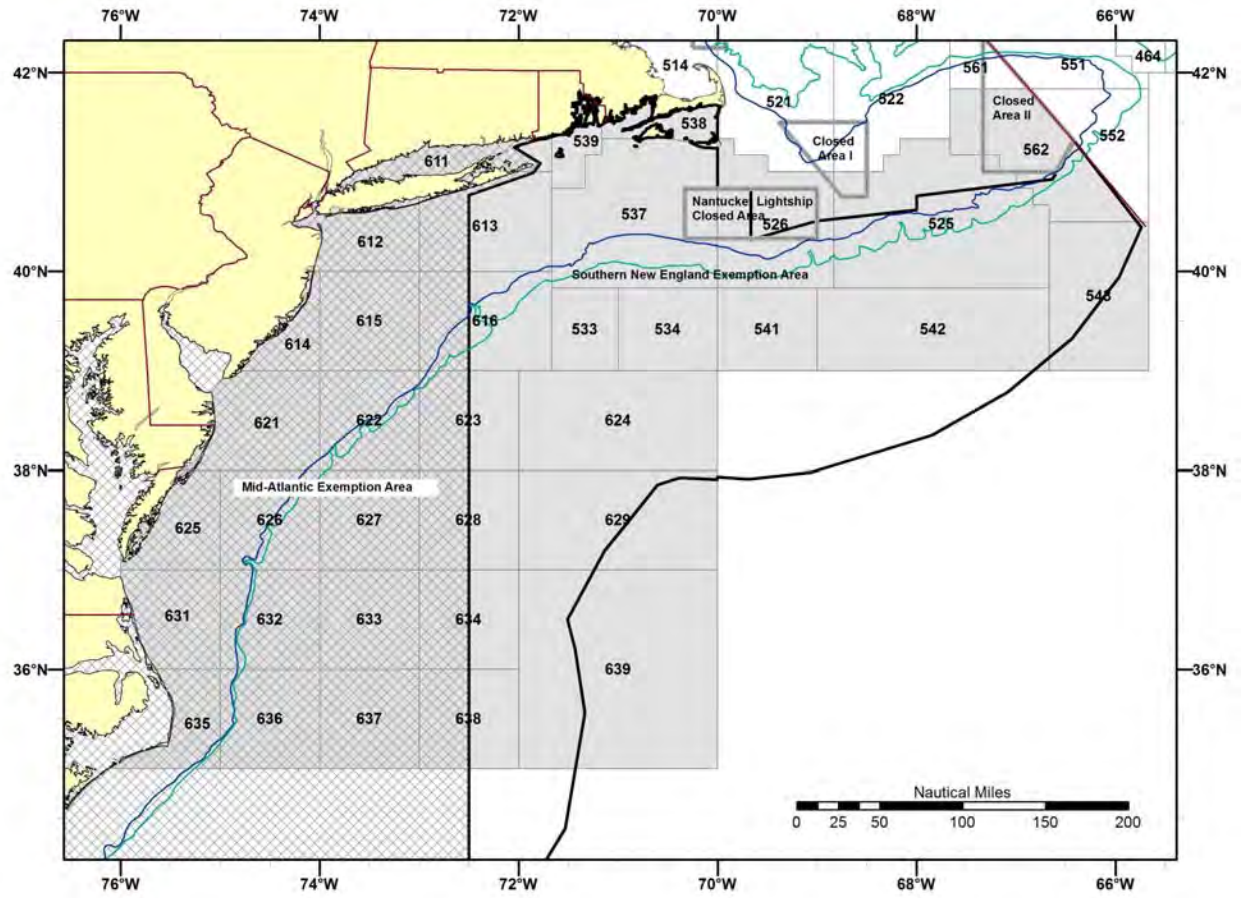
The following alternatives are described below:

1. Incidental possession limits for red hake when landings reach a TAL trigger with alternatives for 200, 300, and 400 lbs.
2. Incidental possession limits for silver hake when landings reach a TAL trigger with alternatives for 500, 1000, and 2000 lbs.
3. No in-season accountability measures
4. No Action – a stock wide in-season AM to be chosen for the Secretarial Amendment

5.6.1 Red hake incidental possession limits for the southern stock area

One of the following possession limits would be automatically triggered when southern stock area red hake landings reach 90% of the TAL and the Regional Administrator determines that without taking action landings would exceed the TAL for that stock by the end of the fishing year or quarter. If the Council chooses different red hake possession limits for the northern and southern stock areas and the vessel fishes in both the Gulf of Maine/Georges Bank and Southern New England or Mid-Atlantic exemption areas (Map 4) during a trip, the lower of the stock area possession limits will apply to that trip. These limits would be implemented by Notice Action and would remain in place until the end of the fishing year.

Map 4. Relationship between three digit statistical areas and the Southern New England and Mid-Atlantic Exemption Areas. Catches from the shaded statistical areas are attributed to the southern stock area, consistent with the small mesh multispecies stock assessments.



5.6.1.1 200 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 200 lbs. of whole or whole weight equivalent of red hake may be retained on board vessels fishing in the Southern New England and/or Mid-Atlantic exemption areas (see Map 4). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This incidental limit would discourage vessels from targeting red hake and encourage vessels to fish in other areas where red hake are less abundant. Out of the options examined by the PDT, this alternative was determined to be the most effective at discouraging vessels from targeting red hake, but would increase discards more than the other alternatives, particularly for vessels that target silver hake with small mesh trawls.

5.6.1.2 300 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 300 lbs. of whole or whole weight equivalent of red hake may be retained on board vessels fishing in the Southern New England and/or

Mid-Atlantic exemption areas (see Map 4). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting red hake and encourage vessels to fish in other areas where red hake are less abundant, but would be less effective than the above alternative and more effective than the alternative below. Compared to the expected behavior for the alternative above, some vessels fishing inshore on day trips may continue to target red hake, particularly to be sold as bait, and vessels targeting silver hake may have less incentive to avoid catching red hake.

On the other hand, this alternative would increase discards less than the above alternative because more trips would be unaffected by the higher incidental possession limit.

5.6.1.3 400 pounds of whole landings, no more than one landing in a calendar day (Preferred Alternative)

When triggered by the process described above, no more than 400 lbs. of whole or whole weight equivalent of red hake may be retained on board vessels fishing in the Southern New England and/or Mid-Atlantic exemption areas (see Map 4). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting red hake and encourage vessels to fish in other areas where red hake are less abundant, but would be less effective than either of the above alternatives. Compared to the expected behavior for the two alternatives above, some vessels fishing inshore on day trips may continue to target red hake, particularly to be sold as bait, and vessels targeting silver hake may have less incentive to avoid catching red hake.

On the other hand, this alternative would increase discards less than the other alternatives because more trips would be unaffected by the higher incidental possession limit.

N.B. This alternative is being proposed as part of the Secretarial Amendment.

The Council designated this alternative as preferred because analysis by the Whiting PDT indicates that it is likely to be effective in keeping landings (and induced discards) below the TAL. There isn't a meaningful contrast in the effectiveness of lower incidental possession limits, but a 200 lbs. possession limit is estimated to cause an unacceptable increase in discards.

5.6.2 Silver hake incidental possession limits for the southern stock area

One of the following possession limits would be automatically triggered when southern stock area silver hake landings reach 90% of the TAL and the Regional Administrator determines that without taking action landings would exceed the TAL for that stock by the end of the fishing year or quarter. If the Council chooses different red hake possession limits for the northern and southern stock areas and the vessel fishes in both the Gulf of Maine/Georges Bank and Southern New England or Mid-Atlantic exemption areas (Map 4) during a trip, the lower of the stock area possession limits will apply to that trip. These limits would be implemented by Notice Action and would remain in place until the end of the fishing year.

5.6.2.1 500 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 500 lbs. of whole or whole weight equivalent of silver hake may be retained on board vessels fishing in the Southern New England and/or Mid-Atlantic exemption areas (see Map 4). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This incidental limit would discourage vessels from targeting silver hake and encourage vessels to fish in other areas where silver hake are less abundant, stop fishing, or target other species with different gear. Since vessels that land more than this amount of silver hake are typically using small mesh trawls to target the species, many vessels would stop fishing for silver hake.

Out of the options examined by the PDT, this alternative was determined to be the most effective at discouraging vessels from targeting silver hake, but would increase discards more than the other alternatives, particularly for vessels that fish for other species using large mesh trawls and catch larger quantities of silver hake.

5.6.2.2 1000 pounds of whole landings, no more than one landing in a calendar day

When triggered by the process described above, no more than 1000 lbs. of whole or whole weight equivalent of silver hake may be retained on board vessels fishing in the Southern New England and/or Mid-Atlantic exemption areas (see Map 4). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting silver hake and encourage vessels to fish in other areas where silver hake are less abundant, but would be less effective than the above alternative and more effective than the alternative below. Compared to the expected behavior for the alternative above, some vessels fishing inshore on day trips may continue to target silver hake, particularly to be sold as bait or food, and vessels targeting other species may have less incentive to avoid catching silver hake.

On the other hand, this alternative would increase discards less than the above alternative because more trips would be unaffected by the higher incidental possession limit.

N.B. This alternative is being proposed as part of the Secretarial Amendment.

5.6.2.3 2000 pounds of whole landings, no more than one landing in a calendar day (Preferred Alternative)

When triggered by the process described above, no more than 2000 lbs. of whole or whole weight equivalent of silver hake may be retained on board vessels fishing in the Southern New England and/or Mid-Atlantic exemption areas (see Map 4). A vessel may not land more than the incidental possession limit in a single calendar day.

Rationale: This limit would discourage vessels from targeting silver hake and encourage vessels to fish in other areas where silver hake are less abundant, but would be less effective than either of the above alternatives. Compared to the expected behavior for the two alternatives above, some vessels fishing inshore on day trips may continue to target silver hake, particularly to be sold as bait or food, and vessels targeting other species may have less incentive to avoid catching silver hake.

On the other hand, this alternative would increase discards less than the other alternatives because more trips would be unaffected by the higher incidental possession limit.

The Council designated this alternative as preferred because analysis by the Whiting PDT indicates that it is likely to be effective in keeping landings (and induced discards) below the TAL. There isn't a meaningful contrast in the effectiveness of lower incidental possession limits, but a 500 lbs. possession limit is estimated to cause an unacceptable increase in discards.

5.6.3 No in-season accountability measures[6]

This alternative proposes no incidental possession limits for either red or silver hake in the southern stock area. Year around possession limits would remain in place throughout the fishing year, regardless of whether or not landings exceed the TALs.

Rationale: This alternative would rely entirely on post-season accountability measures (Section 5.5) to prevent overfishing. In-season accountability measures may be unnecessary at this time, particularly for stocks where catches have been significantly below the ACLs. The Council could develop and implement in-season accountability measures later if needed through an amendment or framework action, but this would take time and would be unlikely to be available during a fishing year when catches first approach the ACLs. This alternative would thus be more risky than ones with in season accountability measures and may limit fishing in future years as a payback for prior overages.

5.6.4 No Action

This alternative will make no changes to the in-season accountability measures that may be included in the Secretarial Amendment to curtail landings and catch when the former approaches the TAL. The Secretarial Amendment is proposing a 400 lbs. incidental red hake possession limit and a 2000 lbs. silver/offshore hake possession limit.

Rationale: This measure is likely to be approved and implemented in the Secretarial Amendment. If one of the above alternatives is chosen it might be implemented mid-season after an accountability measure has already gone into effect.

5.7 Year around red hake possession limits

The intent of establishing red hake possession limits that apply year around is to reduce the potential for the season to end early, reduce the risk that catches may exceed the ACL or landings exceed the TAL, and/or improve size selectivity through differential possession limits for vessels targeting hakes with 3 inch or larger mesh, similar to existing regulations for possession of silver hake. A year-around possession limit also reduces the potential for fishermen to exhibit derby style fishing behavior, landing large quantities of red hake before a TAL trigger is met and incidental possession limits are imposed. The proposed possession limits are intended to be high to accommodate most or all landings that have occurred in recent years to achieve the above objectives, but not reduce landings.

5.7.1 Northern stock possession limits

Based on 2008-2010 dealer data, the Council would set a red hake possession limit between 1,000 and 3,000 pounds of whole red hake or whole weight equivalent for vessels using 2.5 to 5 inch square or diamond cod end mesh and from 300 and 1,200 pounds of whole red hake or whole weight equivalent for vessels using all other cod end meshes and other gears, while fishing in the Gulf of Maine/Georges Bank

[6] This alternative is not equivalent to No Action, because the Council expects that the Secretarial Amendment will include some form of northern stock area in-season accountability measures.

exemption area (Map 3). Vessels may not land more than the possession limit within a calendar day. If a vessel fishes in both the Gulf of Maine/Georges Bank and Southern New England exemption areas during a trip and different red hake possession limits apply, the lower of the exemption area possession limits will apply to that trip, the lower limit will apply to the entire trip.

Rationale: Recent red hake catches were at almost the same level as the proposed ACL. Year around possession limits would reduce the potential by existing vessels to increase fishing effort targeting red hake. This measure could reduce the potential for derby style fishing behavior. The proposed possession limits would accommodate 80% or more of the landings that occurred in 2008-2010. At the upper end of the range, the limit would have allowed all trips to land the amount of red hake they had landed under then-existing regulations, i.e. the limit would not have constrained reported trips but would prevent some trips from landing more than the proposed possession limit by increasing fishing effort targeting red hake. Lower limits for vessels using smaller than 2.5 inch mesh will discourage targeting red hake with very small mesh. The lower limits for large mesh are based on historic landings and accommodate most or all of the reported trips.

5.7.2 Southern stock possession limits

Based on 2008-2010 dealer data, the Council would set a red hake possession limit between 4,000 and 10,000 pounds of whole red hake or whole weight equivalent for vessels using 2.5 to 5 inch square or diamond cod end mesh and from 2,000 and 6,000 pounds of whole red hake or whole weight equivalent for vessels using all other cod end meshes and other gears, while fishing in the Southern New England or Mid-Atlantic exempted areas. Vessels may not land more than the possession limit within a calendar day. If the Council chooses different red hake possession limits for the northern and southern stock areas and the vessel fishes in both the Gulf of Maine/Georges Bank (Map 3) and Southern New England or Mid-Atlantic exemption areas (Map 4) during a trip, the lower of the stock area possession limits will apply to that trip.

Rationale: Recent red hake catches were at almost the same level as the proposed ACL. Year around possession limits would reduce the potential by existing vessels to increase fishing effort targeting red hake. This measure could reduce the potential for derby style fishing behavior. The proposed possession limits would accommodate 80% or more of the landings that occurred in 2008-2010. At the upper end of the range, the limit would have allowed all trips to land the amount of red hake they had landed under then-existing regulations, i.e. the limit would not have constrained reported trips but would prevent some trips from landing more than the proposed possession limit by increasing fishing effort targeting red hake.

5.7.3 No red hake possession limits (No Action/Status quo; Preferred Alternative)

Unless landings reached the TAL triggers and incidental possession limits apply, no red hake possession limits would apply. The Council may select No Action for one stock area, but establish a year around possession limit for the other area, or select No Action for both stock areas.

Rationale: Possession limits could unnecessarily constrain landings and could cause discarding when large catches of red hake occur. The Council designated this alternative as preferred because it was unclear that the mesh size based possession limits would reduce the risk of increasing fishing effort on red hake or that the higher possession limits for 2.5 to 5 inch mesh would improve size selectivity by the fishery.

5.8 TAL monitoring, in addition to existing reporting requirements

Additional reporting requirements will be needed to make timely assessment of landings to stock or management area.

5.8.1 Weekly Vessel Trip Reports (VTRs) (Preferred Alternative)

Vessels taking small mesh multispecies trips and landing red, silver, or offshore hake would be required to make weekly VTR reports, which NMFS will use to assign dealer-reported hake landings to stock area or small mesh area program. If necessary, NMFS may add a gear code to the VTR system to identify small mesh trawls used to target red, silver, and offshore hake. No additional reporting requirements will be needed, but the reports must comply with existing rules for vessel operators submitting VTR reports.

In order to link this information the vessel operator must provide a VTR serial number to the dealer or dealers purchasing the fish from that trip, as well as to the observer if the trip is observed. The dealer will include this serial number when reporting purchases to NMFS. NMFS will provide directions for reporting this serial number for those vessels that fish in multiple statistical areas or use multiple gears on the same trip (vessels are required to submit a new VTR page for each statistical area fished or gear used).

Rationale: This requirement would enable NMFS to determine in near real time the origin of landings and assign the landings to the appropriate stock area or management program. Unless other more burdensome reporting or sampling occurs, NMFS would have no other way to assign landings to the proper area until well after the end of the fishing year, using existing processing procedures used to assign catch to stock area for assessments.

The Council designated this alternative as preferred because it would allow the most timely monitoring of the TAL triggers and improve the accuracy of assigning landings to the appropriate stock and/or management area.

5.8.2 Assigning landings to management program based on gear use

Only red hake landings reported by vessels using small mesh (including shrimp trawls) would be applied to the landings targets for Cultivator Shoals and other exempted areas (Map 3). The combination of a gear descriptions/codes and the three digit statistical area, and trip or landings dates will be used to assign landings to the appropriate small mesh area program.

Landings by all other gears, including but not limited to large mesh trawl, gillnets, and herring mid-water trawls and purse seines [as defined in 50 CFR §648.2 and regulated under 50 CFR §648(d) and (e)] would be counted against the Gulf of Maine/Northern Georges Bank exemption area (Map 3) TAL. NMFS would use gear usage as reported on a vessel's VTR to assign landings appropriately.

This procedure would only apply to the northern stock area unless the Council later defined specific small mesh exemption areas in the Southern New England and Mid-Atlantic exemption areas. And this procedure is unnecessary unless there are small mesh area program landings targets (Sections 5.3.2 and 5.3.3) and accountability measure triggers.

Rationale: This procedure would ensure that landings are monitored in the same manner as the procedure applied to estimate the small mesh area program landings targets (Sections 5.3.2 and 5.3.3)

5.8.3 No additional monitoring (No Action) – landings assigned to stock area on an annual basis using existing NEFSC area allocations procedures that use Vessel Trip Reports (VTRs).

NMFS would use existing procedures to allocate catches and landings to stock area based on VTRs which are submitted according to the existing schedule

Rationale: This alternative would only be appropriate if no real time monitoring were needed to implement in season accountability measures.

5.9 Post season accountability measures (northern and southern stock areas individually)

The intent of post season accountability measures is to mitigate the effects of overharvesting when catches for prior years exceeds the ACL. Re-active measures could include one-for-one reductions in future catch and/or landings limits or changes in buffers and specifications to reduce the risk that catches will exceed the ACLs. The Council may select one alternative or the other, but not both.

5.9.1 Pound-for-pound payback provision to apply in year 2, following a year when catches exceed the ACL (No Action)

When catches of either red or silver/offshore hake exceed the ACL, the ACL for the second year after the overage occurs will be reduced by an equivalent amount. The TALs and small mesh area program landings targets would be reduced accordingly. Landings that exceed a TAL will not trigger a post-season accountability measure if the ACL is not exceeded. This reduction to account for prior overages would be temporary and the ACL would revert back to previous amounts (as adjusted by specification updates), unless overages continued occurring and would be applied to future allocations.

If the 2012 silver hake ACL is exceeded by 1,000 mt, for example, the Regional Administrator will reduce the 2014 ACL by 1,000 mt by Notice Action. In 2015, the ACL would revert back to the specified amount unless more overages occurred in 2013.

Rationale: Some type of accountability when catches exceed the ACL is required by the Magnuson-Stevens Act. This alternative would ensure that catches do not continually exceed the ACLs and increase the risk of persistent overfishing. The adjustment is applied to the second year to allow time to collect the data necessary to determine whether the prior year's ACLs had been exceeded and apply it to a fishing year that has not begun. Applying adjustments to a fishing year already underway could cause unnecessary disruptions and uncertainty, allowing insufficient time for the fishery to adjust.

N.B. This alternative is being proposed as part of the Secretarial Amendment.

5.9.2 Reduce the incidental possession limit trigger (described in Sections 5.3.1 and 5.5) in year 2, following a year when catches exceed the ACL (Preferred Alternative)

When catches of either red or silver hake exceed the ACL, the in season accountability measure trigger (proposed at 90% of TALs) would be reduced by an equivalent percentage that the prior year's catch exceeds the ACL. In this alternative, the ACL would remain at the same amount, but the incidental possession limit trigger level (proposed at 90%) would be reduced. This adjustment would persist indefinitely to reduce the risk of future overages, unless it were adjusted through the specifications process, a framework adjustment, or amendment.

If the 2012 catch exceeds the ACL by 8 percent, for example, the accountability measure trigger for 2014 would decrease from 90% (proposed by this amendment) to 82 percent of the stock area TALs and the management program landings targets (if approved in the final amendment).

Rationale: Reducing the landings triggers that initiate incidental possession limits would reduce the risk that future catches exceed the ACL and cause overfishing to occur. If the cause of the overage had been due to landings exceeding the TALs, this automatic adjustment would make that outcome less likely. If the cause of the overage had been an increase in discards, this automatic adjustment would make it less likely that landings would reach the TALs, leaving more room to account for the additional discards until the Council adjusted the specifications through regular procedures.

The Council designated this alternative as preferred because it more directly reduces the trips targeting red or silver hakes, and consequently overall landings and catch by the directed fishery.

6.0 CONSIDERED BUT REJECTED ALTERNATIVES

The following sections describe some management approaches that the Council considered but rejected at face value during the development of this amendment. A summary of the rationale for their rejection is given.

6.1 Limited Access and/or Catch Share Management

The Council would establish entry requirements and possibly allocations based on historic participation in the fishery. Future participation in the fishery would require a permit issued on the basis of prior participation and may include catch restrictions for a vessel or sector (a group of self-selected vessels) based on the level of their past participation. The Council established a control date of March 23, 2003 that could be used as part of the basis for determination of eligibility. Vessels that began participating in the fishery after the control date may be denied access to the future fishery or be given no allocation.

Rationale for rejection: Although supported by the fishing industry, development of limited access or catch share management was postponed, largely because such allocations are difficult to make, take time to develop, and are often controversial. The Council feared that if it attempted to develop such management measures in Amendment 19 it would delay implementation for at least a year, missing the MSA deadline to establish ACL specifications by 2011. The level of access or allocations would also depend on the amount of fish that were likely to be available through the ABC. High ABCs could allow more liberal access, and vice versa. Therefore it was difficult to make much headway on this important management issue until Aug 2011 when the ABCs were approved.

6.2 Zero Possession Limits When Landings Reach 100% of TALS (i.e. Fishery Closure)

This measure to close a fishery when landings reach the TALs would prohibit posession during the allocation period (a fishing year, quarter, trimester, etc.). Vessels would be unable to target the species when this occurred and incidental catches while targeting other species would have to be discarded. Possibly as a part of this alternative, fishing in the small mesh area programs might be prohibited when the landings for red or silver hake reached the TAL for that area.

Rationale for rejection: Although this management measure applies in some other fisheries, particularly in the Mid-Atlantic region, red and silver hake are caught in significant amounts in other fisheries (e.g. large mesh groundfish, shrimp, herring, scallop) and cannot be avoided. Thus this measure would have

maximum effect on landings, but would not stop catches from occurring. The Council believes that such a measure would cause unacceptable discarding with little chance of survival.

6.3 TALs by Exemption Areas (The Committee Decided To Establish Landings Targets, Instead)

This alternative would establish red and silver hake TALs for the fishing year in the Cultivator Shoals Area and the other Small Mesh Area (Gulf of Maine Raised Footrope, Small Mesh Area I and II, MA Raised Footrope Areas) Programs. These TALs would be the same as the proposed landings targets, but would be considered as ceilings or caps, rather than targets. Landings that exceeded the TALs would not be acceptable and post-season AMs would apply. In-season AMs might also apply, but might be more restrictive than those considered in this amendment to keep actual landings from exceeding the TALs.

Rationale for rejection: This type of alternative was deemed inconsistent with the objective to prevent catch from exceeding the ACLs for the stock area as a whole. It could also impose unnecessary economic costs on the industry and lost fishing opportunity. Vessels fishing for other species using large mesh, for example, might face incidental catch limits that do not allow them to land their entire red or silver hake catches, even if the landings from the small mesh areas were well under the TALs. Conversely, fishing in the small mesh areas might be restricted more than necessary to reduce the potential for incidental catches from elsewhere from exceeding the TAL for other types of fishing effort (such as herring fishing and fishing for large mesh multispecies).

6.4 In-Season AMs for Silver Hake Caught in Small Mesh Area Programs

In addition to stock area in-season AMs, this alternative would establish incidental possession limits (or other measures) that apply to small mesh area programs as in-season AMs. This measure would be similar to the red hake AMs proposed in Section 5.4.3.1, intended to allow vessels to fish for silver hake while changing fishing behavior to catch fewer red hake.

Rationale for rejection: Unlike red hake, it is unlikely that silver hake landings will approach the TALs any time soon. Red hake could become a 'choke' species, preventing fishermen from targeting other species like silver hake, even though fishermen have indicated that they can fish in certain ways and at certain times of the year to avoid catching many red hake while they target silver hake. On the other hand, silver hake are the target of most trips in the small mesh areas, nearly all trips in the Cultivator Shoals Area. Except for trips targeting red hake for bait sales, most trips target silver hake. The Council therefore deemed small mesh area in-season AMs for silver hake as being not only unnecessary, but inconsistent with the intended effect of such a measure.

7.0 AFFECTED ENVIRONMENT (EA)

7.1 Biological Environment

7.1.1 Summary of life history characteristics

7.1.1.1 Silver hake

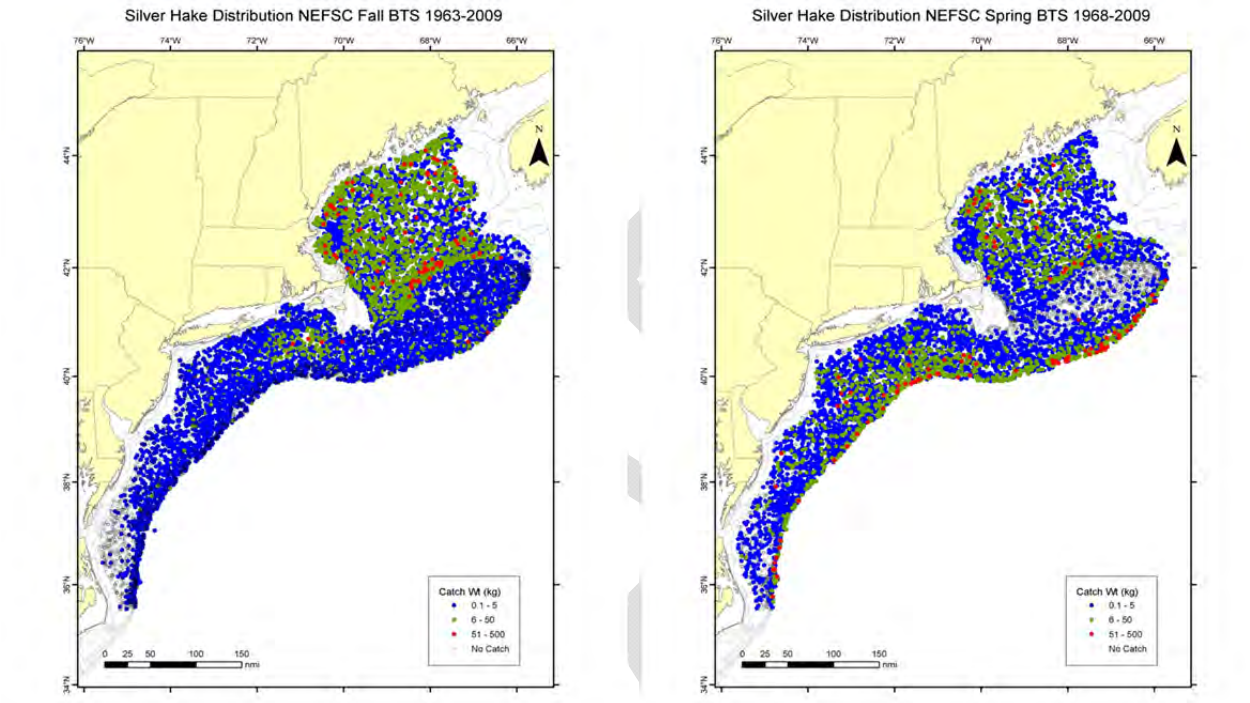
Silver hake, *Merluccius bilinearis*, also known as whiting, range from the Grand Banks of Southern Newfoundland to South Carolina (Brodziak, 2001, Lock and Packer 2004). In U.S. waters, two subpopulations of silver hake are assumed to exist within the EEZ based on numerous methods, primarily morphometric differences and otolith micro-constituent differences (Conover et al. 1967, Almeida 1987, Bolles and Begg 2000). The northern silver hake stock inhabits the Gulf of Maine to Northern Georges Bank waters, while the southern silver hake stock inhabits Southern Georges Bank to the Mid Atlantic Bight waters (Figure 3). However, Bolles and Begg (2000) reported some mixing of silver hake due to their wide migratory patterns, but the degree of mixing among the management areas is unknown. A re-evaluation of stock structure in the last silver hake assessment, based on trends in adult biomass, icthyolplankton survey, growth and maturity analyses, also suggests that reproductive isolation between the two stocks is unlikely (NEFSC, 2010). Based on the mixed evidence on silver hake stock structure (morphometrics, tagging, discontinuous larva distribution, homogeneous growth and maturity), it was concluded that there was no strong biological evidence to support either a separate or a single stock structure for silver hake. Thus, the two-stock structure definition remained as the basis for science and management (NEFSC, 2010).

Survey distribution suggests that most of the silver hake are in the Gulf of Maine and on Georges Bank in the fall and along the shelf edge in the spring (Figure 1). Silver hake migrate in response to seasonal changes in water temperatures, moving toward shallow, warmer waters in the spring. Silver hake spawn in shallow waters during late spring and early summer and then return to deeper waters in the autumn (Brodziak et al. 2001). The older, larger silver hake especially prefer deeper waters. During the summer, portions of both stocks can be found on Georges Bank. In winter, fish in the northern stock move to deep basins in the Gulf of Maine, while fish in the southern stock move to outer continental shelf and slope waters. Silver hake are widely distributed, and have been observed at temperature ranges of 2-17° C (36-63° F) and depth ranges of 11-500 m (36-1,640 ft). However, they are most commonly found between 7-10º C (45-50º F) (Lock and Packer 2004).

Female silver hake are serial spawners, producing and releasing up to three batches of eggs in a single spawning season (Collette and Klein-MacPhee eds. 2002). Major spawning areas include the coastal region of the Gulf of Maine from Cape Cod to Grand Manan Island, southern and southeastern Georges Bank, and the southern New England area south of Martha's Vineyard. Peak spawning occurs earlier in the south (May to June) than in the north (July to August). Over 50 percent of age-2 fish (20 to 30 cm, 8 to 12 in) and virtually all age-3 fish (25 to 35 cm, 10 to 14 in) are sexually mature (O'Brien et al. 1993). Silver hake grow to a maximum length of over 70 cm (28 in) and ages up to 14 years have been observed in U.S. waters, although few fish older than age 6 have been observed in recent years (Brodziak et al. 2001, NEFSC 2010). Silver hake are nocturnal, semi-pelagic predators, moving up in the water column to feed at night, primarily between dusk and midnight and returning to rest on the bottom during the day, preferring sandy, muddy or pebble substrate (Collette and Klein-MacPhee eds. 2002). Silver hake population constitutes an important link in the food web dynamics due to their high prey consumption capacity and as food source for major predators in the northwest Atlantic ecosystem. Consumptive estimates of silver hake indicate that predatory consumption represents a major source of silver hake

removals from the system and primarily includes goosefish, bluefish, windowpane, four spot flounder, red hake, cod, silver hake, thorny skate, winter skate, little skate, Pollock and spiny dogfish (Garrison and Link 2000, NEFSC, 2010). Silver hake are generally cannibalistic but their diet varies by region, size, sex, season, migration, spawning and age (Garrison and Link 2000, Lock and Packer 2004, Link et al. 2011).

Figure 1 Fall (left) and spring (right) survey distribution of silver hake from the NEFSC bottom trawl surveys, 1963-2009.



7.1.1.2 Red hake

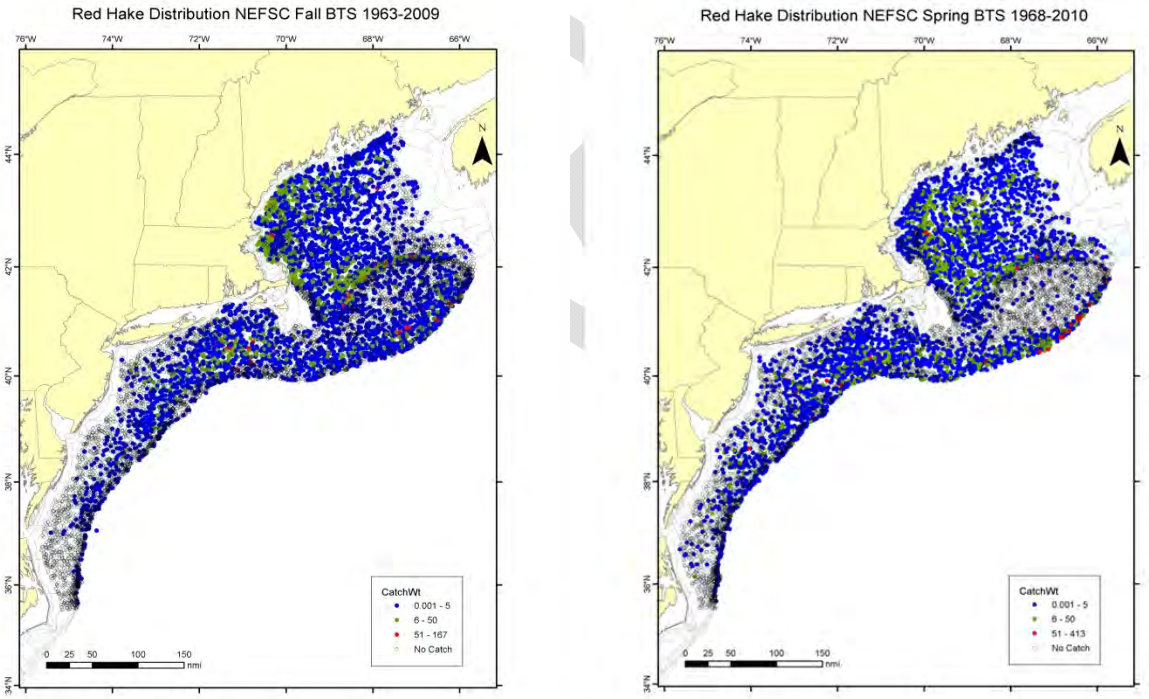
Red hake, Urophycis chuss, is a demersal gadoid species distributed from the Gulf of St. Lawrence to North Carolina, and are most abundant from the western Gulf of Maine through Southern New England waters. Red hake are separated into northern and southern stocks for management purposes. The northern stock is defined as the Gulf of Maine to Northern Georges Bank region, while the southern stock is defined as the Southern Georges Bank to Mid-Atlantic Bight region (Figure 3). Survey distributions indicate that there are higher concentrations of red hake by catch weight (kg) during the NEFSC spring surveys than the NEFSC fall surveys. Less red hake are caught in the middle of Georges Bank in the spring than the fall. They tended to be more in the Gulf of Maine and along the shelf, than in the middle of the bank (Figure 2).

Red hake migrate seasonally, preferring temperatures between 5 and 12° C (41-54° F) (Grosslein and Azarovitz 1982). During the spring and summer months, red hake move into shallower waters to spawn, then move offshore to deep waters in the Gulf of Maine and the edge of the continental shelf along Southern New England and Georges Bank in the winter. Spawning occurs from May through November, with primary spawning grounds on the southwest part of Georges Bank and in the Southern New England area off Montauk Point, Long Island (Colton and Temple 1961).

Red hake do not grow as large as white hake, and normally reach a maximum size of 50 cm (20 in) and 2 kg (4.4 lb) (Musick 1967). Females are generally larger than males of the same age, and reach a maximum length of 63 cm (25 in) and a weight of 3.6 kg (7.9 lb) (Collette and Klein-MacPhee eds. 2002). Although they generally do not live longer than 8 years, red hake have been recorded up to 14 years old. In the northern stock, the age at 50 percent maturity is 1.4 years for males and 1.8 years for females, and the size at 50 percent maturity is 22 cm (8.7 in) for males and 27 cm (10.6 in) for females (O'Brien et al. 1993). In the southern red hake stock, the age at 50 percent maturity is 1.8 years for males and 1.7 years for females, and the size at 50 percent maturity is 24 cm (9.5 in) for males and 25 cm (9.8 in) for females (O'Brien et al. 1993).

Red hake prefer soft sand or muddy bottom, and feed primarily on crustaceans such as euphausiids, decapods, and rock crabs as well as fish such as haddock, silver hake, sea robins, sand lance, mackerel and small red hake (Bowman et al. 2000). Primary predators of red hake include spiny dogfish, cod, goosefish, and silver hake (Rountree 1999). As juveniles, red hake seek shelter from predators in scallop beds, and are commonly found in the mantle cavities of (or underneath) sea scallops. In the fall, red hake likely leave the safety of the scallop beds due to their increasing size and to seek warmer temperatures in offshore waters (Steiner et al. 1982).

Figure 2 Fall (left) and spring (right) survey distribution of red hake from the NEFSC bottom trawl surveys, 1963-2009



7.1.1.3 Offshore hake

Offshore hake (*Merluccius albidus*) is a data-poor stock and very little is known about its biology and life history. They are commonly distributed from southern Georges Bank through the Mid-Atlantic Bight, at depths of 160-550 meters and temperatures ranging between 11-13^{o}C. They are known to co-occur with

silver hake in the outer continental slopes of the Atlantic Ocean and are easily confused with silver hake because of their strong morphological resemblances. There appears to be seasonal differences in the patterns of distribution with concentrations shifting south of Georges Bank in the winter months and extending to the southern flank of Georges Bank and further south in the spring (Figure 4).

The primary source of biological information for offshore hake is the annual fishery independent surveys conducted by the Northeast Fisheries Science Center (NEFSC). Offshore hake Survey catches are generally low and variable relative to other hake species.

Offshore hake are located primarily on the continental shelf and presumably beyond the NEFSC survey area. Offshore hake tend to be concentrated in the southern Georges Bank region in the fall, whereas in the spring, they are found further south in the Mid-Atlantic Bight. However, offshore hake appear to be more abundant during the winter months.

Offshore hake appear to be sexually dimorphic with females slightly larger than males. Females mature at a larger length than males, similar to other gadoid species (O'Brien et al 1993). Maximum size observed in the survey was approximately 56 cm. Length at 50 percent maturity also differed significantly between sexes with females maturing at larger sizes (28 cm) relative to males (23 cm). Spawning generally occurs between April and July. Maximum observed size was approximately 43 cm for males and 56 cm for female (Traver et al. 2011).

Figure 3. Statistical area used to define red and silver hake in the northern and southern management areas. Offshore hake statistical areas are restricted to the southern management region only.

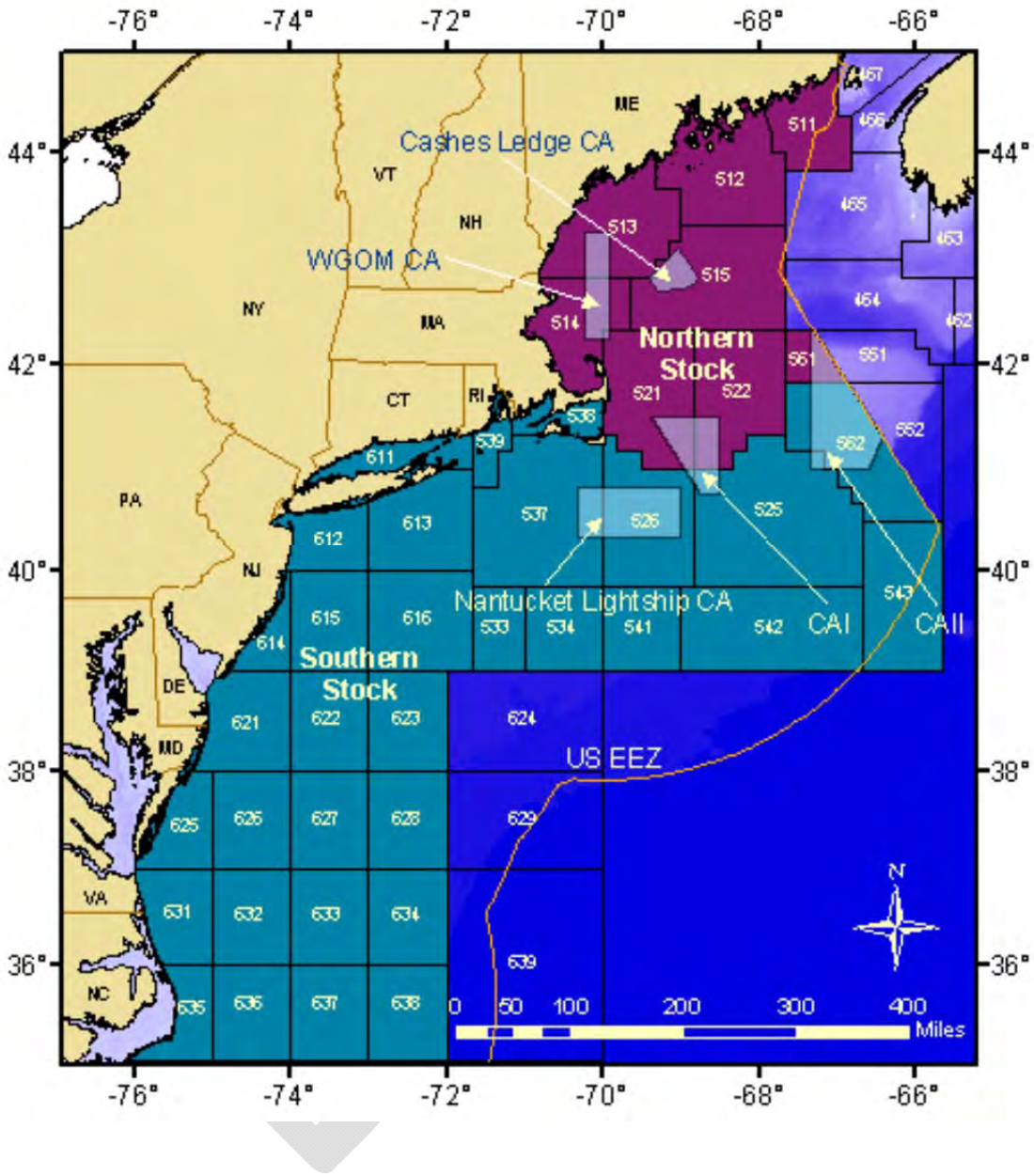
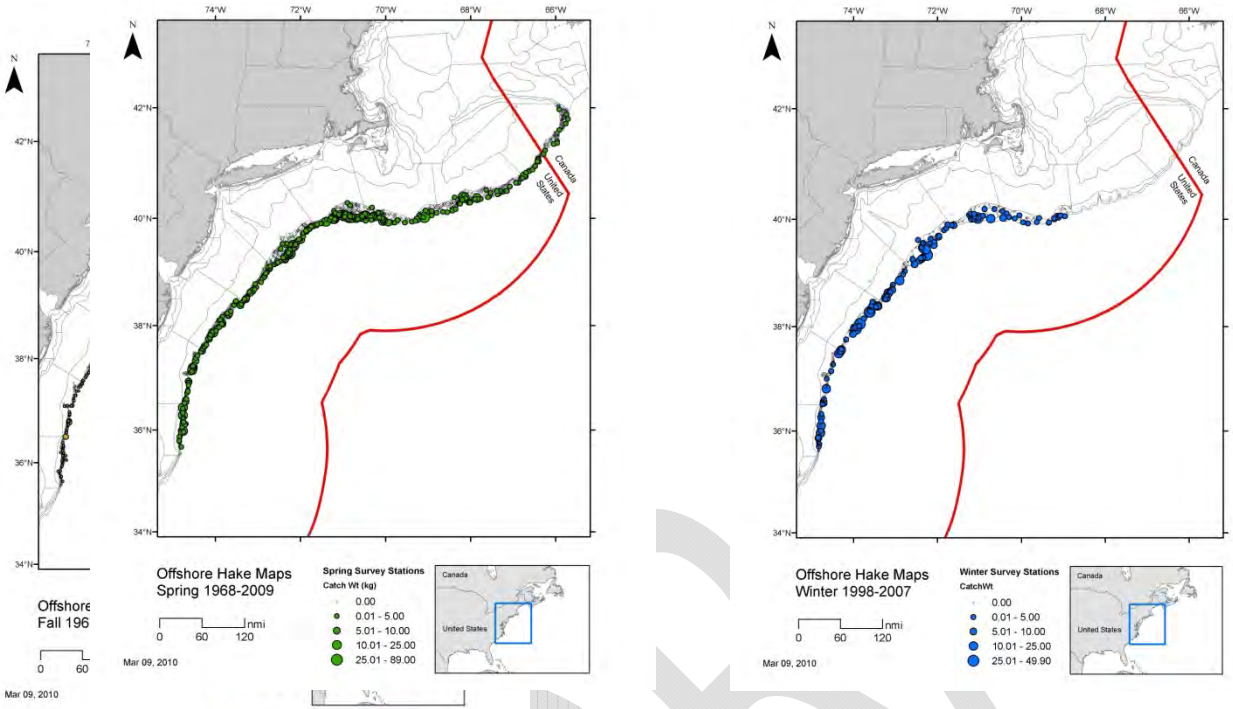


Figure 4 Fall (left), Spring (middle) and winter (right) survey distribution of offshore hake from the nefsc bottom trawl surveys, 1967-2009



7.1.2 Stock status

The 51st Stock Assessment Workshop (SAW 51) met from November 19 through December 3, 2010, at the NEFSC, in Woods Hole, MA to review the benchmark assessments of silver hake *(Merluccius bilinearis*), red hake (*Urophycis chuss*), and offshore hake (*Merluccius albidus*). Despite several attempts to produce an analytical assessment for the hake stocks, the benchmark could not ultimately resolve different signals coming from low catches (especially compared with those in the early part of the time series), increasing stock biomass, and an increasingly truncated age structure in survey catches (i.e., increasing absence of older fish, particularly silver hake). Nonetheless, the benchmark assessment made progress on resolving stock structure, species identification in the survey and commercial catches, and in estimating consumption. Despite the inclusion of predatory consumption estimates which were almost an order of magnitude greater than catch, the analytical models still did not perform well. Instead, the SAW accepted an index based assessment for both red and silver hake status determination, similar to previous assessments, with updated reference points (see Section 4.???). For offshore hake, there was no reliable information about catch or trends in abundance and biomass to guide management of offshore hake.

7.1.2.1 Silver hake

The 2010 silver hake assessment for both the northern and southern management areas included survey data from the NEFSC fall bottom trawl survey, commercial fishing data from vessel trip reports, dealer landings, and on-board fishery observer data through 2009. Since then, the Council's Small-Mesh Multispecies Planning Development Team (PDT) have updated the assessment results to include both the 2010 fall survey biomass and commercial catch data and will be the basis for this report (Table 13 and Table 14).

In the absence of an analytical assessment for silver hake, the biological reference points for both the northern and southern silver hake stocks are as follows (Table 12):

Silver hake is <u>overfished</u> when the three-year moving average of the fall survey weight per tow (i.e. the biomass threshold) is less than one half the B_{MSY} proxy, where the B_{MSY} proxy is defined as the average observed from 1973-1982. The most recent estimates of the biomass thresholds are 3.21 kg/tow for the northern stock, and 0.83 kg/tow for the southern stock.

<u>Overfishing</u> occurs when the ratio between the catch and the arithmetic fall survey biomass index from the most recent three years exceeds the overfishing threshold. The most recent estimates of the overfishing threshold are 2.78 kt/kg for the northern stock and 34.19 kt/kg for the southern stock of silver hake.

Overfishing threshold estimates are based on annual exploitation ratios (catch divided by arithmetic fall survey biomass) averaged from 1973-1982. Catch per tow is in "Albatross" units (Table 13 and Table 14).

Table 12 Revised silver hake overfishing definition reference points.

Stock	Threshold	Target
Northern Silver Hake	½ B_{MSY} Proxy (3.21 kg/tow) F_{MSY} Proxy (2.78 kt/kg)	B_{MSY} Proxy (6.42 kg/tow) F_{MSY} Proxy (n/a)
Southern Silver Hake	½ B_{MSY} Proxy (0.83 kg/tow) F_{MSY} Proxy (34.19 kt/kg)	B_{MSY} Proxy (1.65 kg/tow) F_{MSY} Proxy (n/a)

In the northern management area, the three year average arithmetic mean biomass based on the NEFSC fall bottom trawl survey for data 2008-2010 (8.50 kg/tow) was above the management threshold (3.21 kg/tow) and above the target (6.42 kg/tow). The three year average exploitation index (total catch divided by biomass index) for 2008-2010 (0.17 kt/kg) was below the overfishing threshold (2.78 kt/kg; Figure 5). In the southern management area, the three year arithmetic also based on the NEFSC fall bottom trawl survey data for 2008-2010 (1.76 kg/tow) was above the biomass threshold (0.83 kg/tow) and above the target (1.65 kg/tow). The three year average exploitation index (total catch divided by biomass index) for 2008-2010 (4.72 kt/kg) was below the overfishing threshold (34.19 kt/kg; Figure 6). Therefore, based on the accepted SAW 51 reference points, the northern and southern stocks of silver are NOT overfished and overfishing is NOT occurring.

Table 13. Northern silver hake stock - summary of catch and survey indices in albatross units for northern silver hake, 1955-2010 (*continues onto next page*)

Year	Northern Fall Survey arithmetic kg/tow	Northern Fall Survey 3-year average	Northern Landings (000'smt)	Northern Discards (000's mt)	Northern total catch (000 mt)	Northern Exploitation Index	Northern Exploitation Index (3 year avg)
1955			53.36		53.36		
1956			42.15		42.15		
1957			62.75		62.75		
1958			49.90		49.90		
1959			50.61		50.61		
1960			45.54		45.54		
1961			39.69		39.69		
1962			79.00		79.00		
1963	23.10		73.92		73.92	3.20	
1964	4.34		94.46		94.46	21.77	
1965	7.06	11.50	45.28		45.28	6.41	10.46
1966	4.19	5.20	47.81		47.81	11.41	13.20
1967	2.27	4.51	33.37		33.37	14.70	10.84
1968	2.28	2.91	41.38		41.38	18.15	14.75
1969	2.41	2.32	24.06		24.06	9.98	14.28
1970	3.03	2.57	27.53		27.53	9.09	12.41
1971	2.67	2.70	36.40		36.40	13.63	10.90
1972	5.78	3.83	25.22		25.22	4.36	9.03
1973	4.12	4.19	32.09		32.09	7.79	8.60
1974	3.45	4.45	20.68		20.68	5.99	6.05
1975	8.09	5.22	39.87		39.87	4.93	6.24
1976	11.25	7.60	13.63		13.63	1.21	4.05
1977	6.72	8.69	12.46		12.46	1.85	2.66
1978	6.32	8.10	12.61		12.61	2.00	1.69
1979	6.18	6.41	3.42		3.42	0.55	1.47
1980	7.23	6.58	4.73		4.73	0.65	1.07
1981	4.52	5.98	4.42	2.64	7.05	1.56	0.92
1982	6.28	6.01	4.66	2.91	7.57	1.21	1.14
1983	8.76	6.52	5.31	2.64	7.95	0.91	1.22
1984	3.36	6.13	8.29	2.59	10.88	3.24	1.78
1985	8.28	6.80	8.30	2.56	10.86	1.31	1.82
1986	13.04	8.23	8.50	2.35	10.86	0.83	1.79
1987	9.79	10.37	5.66	2.11	7.77	0.79	0.98
1988	6.05	9.63	6.79	1.79	8.57	1.42	1.01
1989	10.53	8.79	4.65	2.32	6.96	0.66	0.96
1990	15.61	10.73	6.38	1.96	8.34	0.53	0.87

Year	Northern Fall Survey arithmetic kg/tow	Northern Fall Survey 3-year average	Northern Landings (000'smt)	Northern Discards (000's mt)	Northern total catch (000 mt)	Northern Exploitation Index	Northern Exploitation Index (3 year avg)
1991	10.52	13.07	6.06	1.26	7.31	0.69	0.60
1992	10.25	15.61	5.31	1.42	6.73	0.66	0.53
1993	7.50	9.42	4.36	0.69	5.05	0.67	0.67
1994	6.84	8.20	3.90	0.24	4.14	0.61	0.65
1995	12.89	9.08	2.59	0.63	3.22	0.25	0.51
1996	7.57	9.10	3.62	0.82	4.44	0.59	0.48
1997	5.66	8.71	2.80	0.24	3.05	0.54	0.46
1998	18.91	10.71	2.05	0.69	2.74	0.14	0.42
1999	11.15	11.91	3.45	0.74	4.19	0.38	0.35
2000	13.51	14.52	2.59	0.36	2.95	0.22	0.25
2001	8.33	10.28	3.39	0.48	3.87	0.46	0.47
2002	7.99	10.09	2.59	0.51	3.11	0.39	0.47
2003	8.29	8.20	1.81	0.20	2.01	0.24	0.37
2004	3.28	6.52	1.05	0.12	1.16	0.35	0.33
2005	1.72	4.43	0.83	0.06	0.89	0.52	0.37
2006	3.69	2.90	0.90	0.04	0.94	0.26	0.38
2007	6.44	3.95	1.01	0.75	1.76	0.27	0.35
2008	5.27	5.13	0.62	0.17	0.79	0.15	0.23
2009	6.89	6.20	1.04	0.19	1.2320	0.18	0.20
2010	13.35	8.50	1.69	0.79	2.4784	0.19	0.17

Table 14. Southern silver hake stock– summary of catch and survey indices in albatross units for northern silver hake, 1955-2010 (*continues onto next page*)

Year	Southern Fall Survey arithmetic kg/tow	Southern Fall Survey 3-year average	Southern Landings (000'smt)	Southern Discards (000's mt)	Southern total catch (000 mt)	Southern Exploitation Index	Southern Exploitation Index (3 year avg)
1955			13.255		13.255		
1956			14.241		14.241		
1957			16.426		16.426		
1958			12.902		12.902		
1959			16.387		16.387		
1960			8.816		8.816		
1961			12.649		12.649		
1962			17.939		17.939		
1963	4.660		89.425		89.425	19.190	
1964	4.060		147.048		147.048	36.219	
1965	5.280	4.667	294.117		294.117	55.704	37.038
1966	2.640	3.993	202.318		202.318	76.636	56.186
1967	2.440	3.453	87.383		87.383	35.813	56.051
1968	2.730	2.603	58.157		58.157	21.303	44.584
1969	1.260	2.143	74.891		74.891	59.437	38.851
1970	1.350	1.780	26.832		26.832	19.876	33.539
1971	2.210	1.607	70.506		70.506	31.903	37.072
1972	2.130	1.897	88.179		88.179	41.399	31.059
1973	1.700	2.013	102.078		102.078	60.046	44.449
1974	0.850	1.560	102.396		102.396	120.466	73.970
1975	1.790	1.447	72.164		72.164	40.315	73.609
1976	1.990	1.543	64.608		64.608	32.466	64.416
1977	1.680	1.820	57.160		57.160	34.024	35.602
1978	2.500	2.057	25.834		25.834	10.334	25.608
1979	1.680	1.953	16.398		16.398	9.761	18.039
1980	1.630	1.937	11.684		11.684	7.168	9.087
1981	1.120	1.477	13.429	3.502	16.931	15.117	10.682
1982	1.560	1.437	14.152	4.654	18.806	12.055	11.447
1983	2.570	1.750	11.860	4.814	16.674	6.488	11.220
1984	1.40	1.84	12.96	4.88	17.84	12.74	10.43
1985	3.55	2.51	12.82	3.87	16.69	4.70	7.98
1986	1.45	2.13	9.70	4.33	14.03	9.68	9.04
1987	1.95	2.32	9.55	4.25	13.80	7.08	7.15
1988	1.78	1.73	8.95	4.50	13.45	7.55	8.10
1989	1.87	1.87	13.00	6.57	19.57	10.46	8.37
1990	1.52	1.72	13.02	5.97	18.99	12.49	10.17

Year	Southern Fall Survey arithmetic kg/tow	Southern Fall Survey 3-year average	Southern Landings (000'smt)	Southern Discards (000's mt)	Southern total catch (000 mt)	Southern Exploitation Index	Southern Exploitation Index (3 year avg)
1991	0.850	1.413	9.740	3.081	12.821	15.084	12.681
1992	0.990	1.120	10.531	3.446	13.977	14.118	13.899
1993	1.280	1.040	12.487	5.166	17.653	13.791	14.331
1994	0.790	1.020	12.181	5.936	18.117	22.933	16.947
1995	1.590	1.220	11.992	1.402	13.394	8.424	15.049
1996	0.450	0.943	12.134	0.479	12.613	28.029	19.795
1997	0.830	0.957	12.548	0.624	13.172	15.870	17.441
1998	0.570	0.617	12.558	0.526	13.084	22.954	22.284
1999	0.820	0.740	10.417	3.549	13.966	17.032	18.619
2000	0.720	0.703	9.472	0.329	9.801	13.613	17.866
2001	2.040	1.193	8.884	0.188	9.072	4.447	11.697
2002	1.180	1.313	4.888	0.410	5.298	4.490	7.516
2003	1.420	1.547	6.281	0.604	6.885	4.849	4.595
2004	1.240	1.280	6.965	1.203	8.168	6.587	5.309
2005	0.940	1.200	6.395	1.576	7.971	8.480	6.638
2006	1.420	1.200	4.583	0.161	4.744	3.341	6.136
2007	0.870	1.077	5.067	0.146	5.213	5.992	5.938
2008	1.360	1.217	5.582	1.033	6.615	4.864	4.732
2009	1.100	1.110	6.595	0.839	7.434	6.758	5.871
2010	2.818	1.759	6.330	0.780	7.110	2.523	4.715

Figure 5. Northern silver hake fall survey biomass in kg/tow (top) and relative exploitation ratios (bottom) of the total catch (kt) to the fall survey index with their calculated 3-yr running averages (red lines). The solid lines represent the overfishing thresholds.

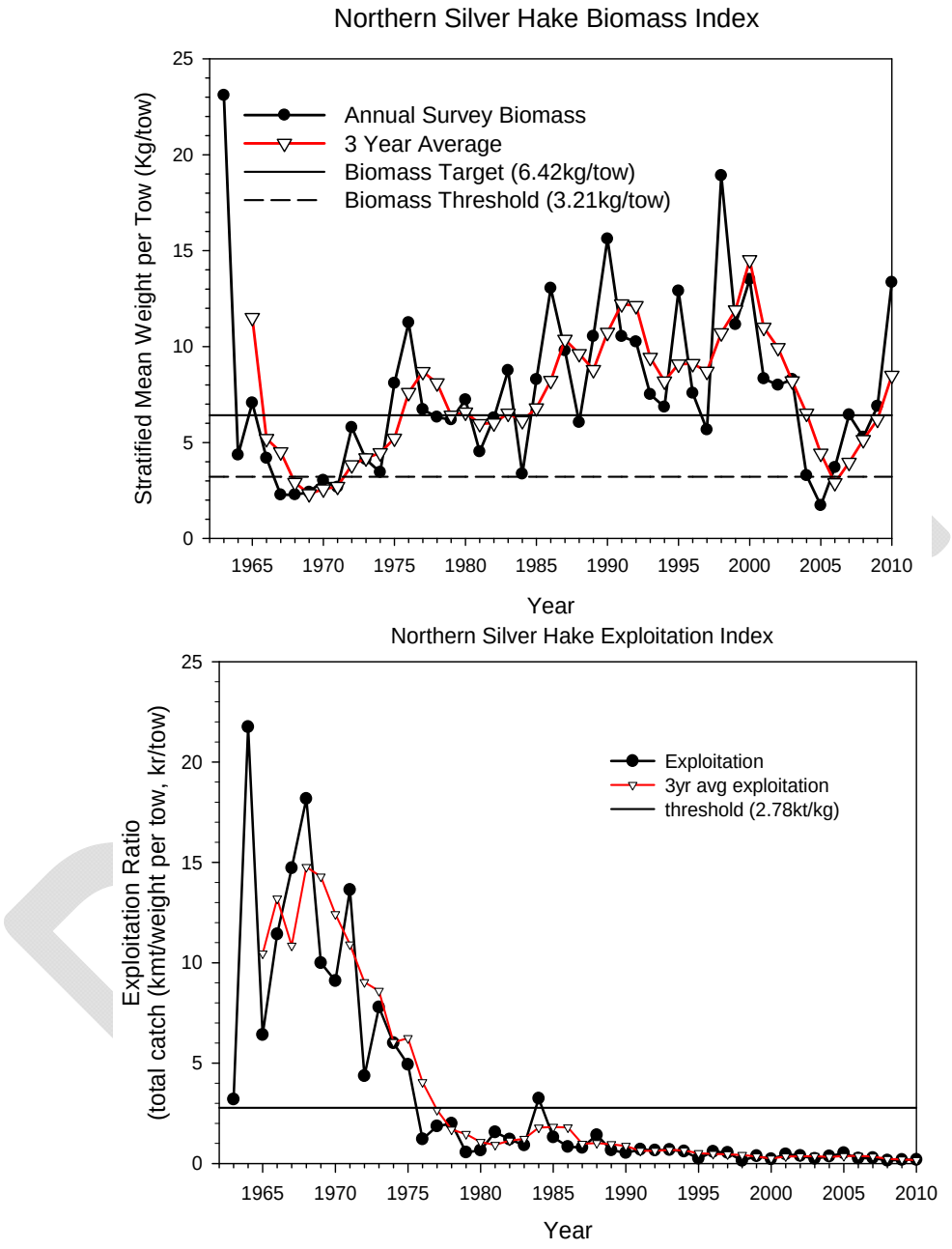
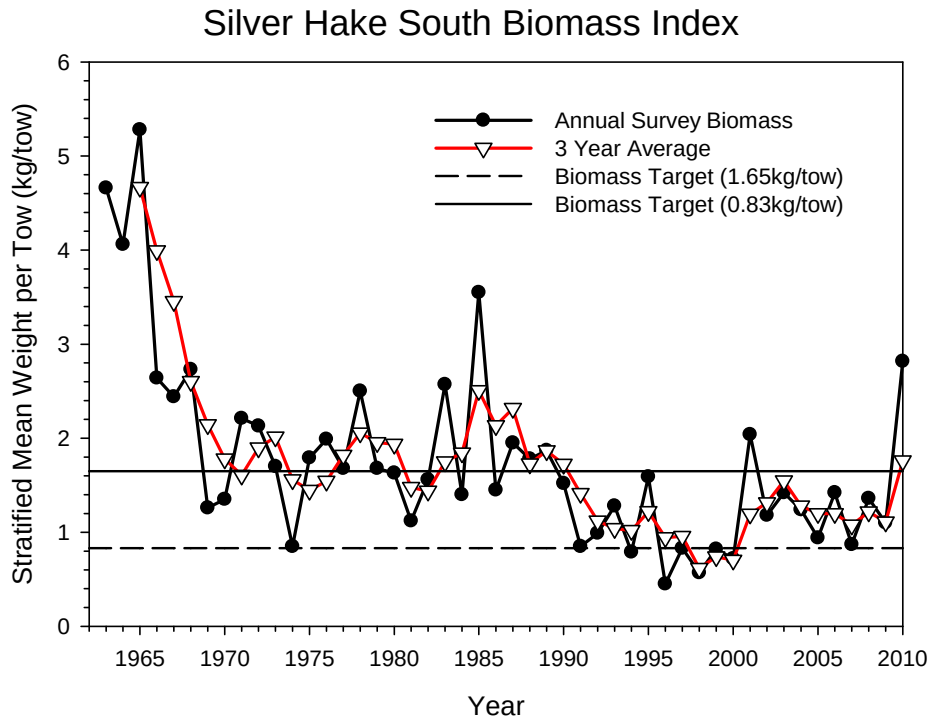
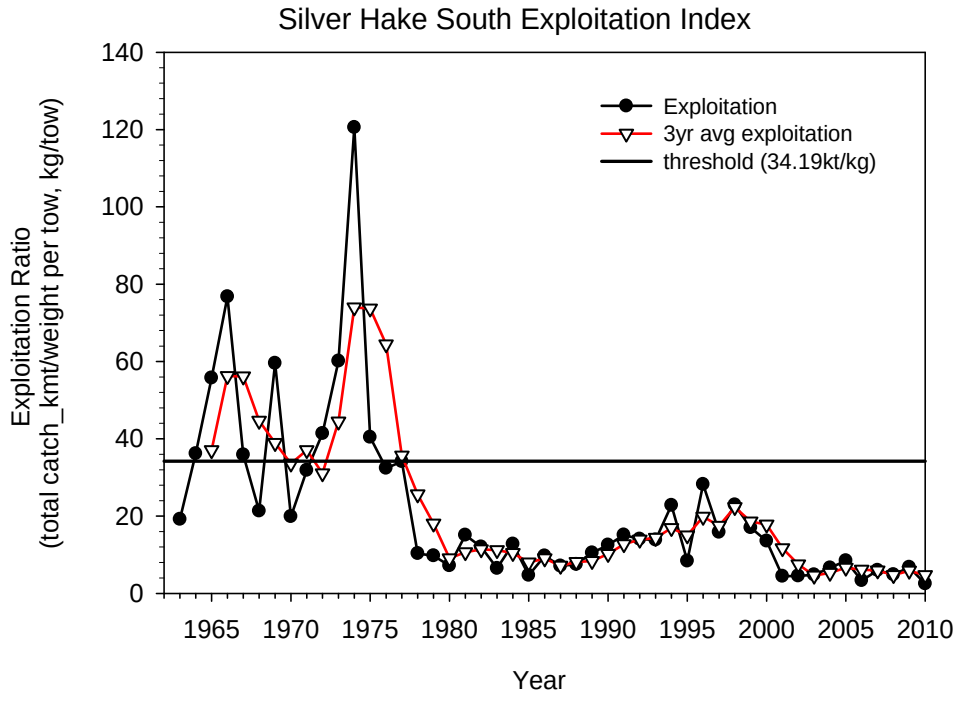


Figure 6. Southern silver hake fall survey biomass in kg/tow (top) and relative exploitation ratios (bottom) of the total catch (kt) to the fall survey index with their calculated 3-yr running averages (red lines). The solid lines represent the overfishing thresholds.





The range of years (1973-1982) adopted during the benchmark assessments for deriving the overfishing definition reference points are considered to be uncertain. The transition from the 1970's to the 1980's highlight a period of high and low productivity with respect to the stock dynamics. This time period also does not include more recent years as basis for defining the F_{MSY} proxy. Recognizing the potential for non-stationary productivity in the stock dynamics and the implications on estimates of the OFL, options for ABCs were explored to account for scientific uncertainty. Other sources uncertainty in the assessment include: truncation in the age structure, estimates of predatory consumption, and catch estimates relative to mixed landings in the fishery (NEFSC, 2011).

7.1.2.2 Red hake

The 2010 red hake assessment included survey data from the NEFSC spring bottom trawl survey through 2010, commercial fishing data from vessel trip reports, dealer landings, and on-board fishery observer data through 2009. Since the last assessment, the Council's Small-Mesh Multispecies PDT have updated the assessment results to include both the 2011 spring survey biomass and the 2010 commercial catch data and will be reflected in this report (Table 16 and Table 17). In the absence of a an analytical assessment for red hake, the biological reference points for both the northern and southern silver stocks are as follows (Table 15):

Red hake is <u>overfished</u> when the three-year moving arithmetic average of the spring survey weight per tow (i.e., the biomass threshold) is less than one half of the B_{MSY} proxy, where the B_{MSY} proxy is defined as the average observed from 1980 – 2010. The current estimates of $B_{THRESHOLD}$ for the northern and southern stocks are 1.27 kg/tow and 0.51 kg/tow, respectively.

<u>Overfishing</u> occurs when the ratio between catch and spring survey biomass for the northern and the southern stocks exceeds 0.163 kt/kg and 3.038 kt/kg, respectively, derived from AIM analyses from 1980-2009.

Table 15 Current Overfishing Definition Reference Points for Red Hake

Stock	Threshold	Target
Northern Red Hake	½ B_{MSY} Proxy (1.27kg/tow) F_{MSY} Proxy (0.163 kt/kg)	B_{MSY} Proxy (n/a) F_{MSY} Proxy (n/a)
Southern Red Hake	½ B_{MSY} Proxy (0.51 kg/tow) F_{MSY} Proxy (3.038 kt/kg)	B_{MSY} Proxy (n/a) F_{MSY} Proxy (n/a)

Table 16. Northern red hake stock - summary of catch and survey indices in albatross units for northern silver hake, 1962-2010 (*continues onto next page*)

Year	Northern Fall Survey arithmetic kg/tow	Northern Fall Survey 3-year average	Northern Landings (000'smt)	Northern Discards (000's mt)	Northern total catch (000 mt)	Northern Exploitation Index	Northern Exploitation Index (3 year avg)
1962			1.918	1.600	3.518		
1963			3.285	1.600	4.885		
1964			1.410	1.701	3.111		
1965			2.774	1.624	4.398		
1966			5.578	1.603	7.181		
1967			1.865	1.404	3.269		
1968	1.138		2.629	1.301	3.930	3.454	
1969	0.639		2.022	1.117	3.138	4.909	
1970	0.541	0.773	1.033	1.098	2.130	3.939	4.101
1971	0.648	0.609	4.806	1.162	5.969	9.211	6.020
1972	1.560	0.916	15.028	0.963	15.991	10.248	7.800
1973	4.311	2.173	15.289	0.909	16.199	3.757	7.739
1974	2.431	2.768	7.226	0.815	8.041	3.308	5.771
1975	4.254	3.665	8.703	1.199	9.902	2.328	3.131
1976	3.371	3.352	6.339	0.925	7.264	2.155	2.597
1977	2.656	3.427	0.894	1.081	1.976	0.744	1.742
1978	2.571	2.866	1.227	1.117	2.345	0.912	1.270
1979	2.041	2.422	1.529	1.223	2.751	1.348	1.001
1980	3.883	2.831	1.033	1.366	2.399	0.618	0.959
1981	6.353	4.092	1.277	1.324	2.601	0.409	0.792
1982	2.127	4.121	1.213	1.460	2.673	1.257	0.761
1983	3.698	4.059	0.895	1.353	2.248	0.608	0.758
1984	2.982	2.936	1.060	1.327	2.388	0.801	0.888
1985	3.913	3.531	0.992	1.270	2.262	0.578	0.662
1986	3.260	3.385	1.458	1.189	2.646	0.812	0.730
1987	2.941	3.371	1.013	1.052	2.066	0.702	0.697
1988	1.996	2.732	0.866	0.897	1.763	0.883	0.799
1989	1.651	2.196	0.777	1.447	2.224	1.347	0.977
1990	1.331	1.660	0.830	0.595	1.425	1.070	1.100

Year	Northern Fall Survey arithmetic kg/tow	Northern Fall Survey 3-year average	Northern Landings (000'smt)	Northern Discards (000's mt)	Northern total catch (000 mt)	Northern Exploitation Index	Northern Exploitation Index (3 year avg)
1991	1.621	1.621	0.745	0.818	1.563	0.964	0.964
1992	2.501	2.061	0.918	0.726	1.645	0.658	0.811
1993	2.824	2.315	0.769	0.083	0.853	0.302	0.641
1994	1.590	2.305	0.729	0.077	0.806	0.507	0.489
1995	1.973	2.129	0.187	0.063	0.250	0.127	0.312
1996	1.792	1.785	0.414	0.656	1.070	0.597	0.410
1997	1.811	1.859	0.339	0.125	0.464	0.256	0.327
1998	2.519	2.041	0.187	0.130	0.317	0.126	0.326
1999	2.322	2.217	0.220	0.468	0.687	0.296	0.226
2000	3.186	2.676	0.197	0.055	0.252	0.079	0.167
2001	3.579	3.029	0.223	0.135	0.358	0.100	0.158
2002	4.460	3.742	0.275	0.101	0.376	0.084	0.088
2003	0.996	3.012	0.210	0.088	0.297	0.298	0.161
2004	1.772	2.409	0.103	0.057	0.160	0.090	0.158
2005	1.097	1.288	0.096	0.057	0.153	0.140	0.176
2006	0.912	1.260	0.096	0.181	0.277	0.303	0.178
2007	2.056	1.355	0.069	0.127	0.197	0.096	0.180
2008	3.488	2.152	0.052	0.059	0.112	0.032	0.144
2009	1.748	2.431	0.085	0.095	0.180	0.103	0.077
2010	2.020	2.419	0.067	0.244	0.311	0.154	0.096
2011	**2.178**	1.982					

Table 17. Southern red hake stock - summary of catch and survey indices in albatross units for northern silver hake, 1962-2010 (*continues onto next page*)

Year	Southern Fall Survey arithmetic kg/tow	Southern Fall Survey 3-year average	Southern Landings (000'smt)	Southern Discards (000's mt)	Southern total catch (000 mt)	Southern Exploitation Index	Southern Exploitation Index (3 year avg)
1962			12.757	4.000	16.757		
1963			32.671	4.000	36.671		
1964			44.221	3.758	47.979		
1965			93.624	4.292	97.916		
1966			108.016	3.773	111.789		
1967			58.948	3.660	62.608		
1968	1.285		18.713	3.715	22.428	17.450	
1969	1.082		53.417	3.623	57.040	52.707	
1970	1.723	1.364	11.864	3.141	15.005	8.708	26.288
1971	3.488	2.098	35.421	2.313	37.734	10.817	24.077
1972	3.590	2.934	61.371	2.098	63.469	17.680	12.402
1973	3.992	3.690	51.679	2.240	53.919	13.506	14.001
1974	2.838	3.473	26.834	2.158	28.992	10.217	13.801
1975	3.179	3.336	20.028	1.763	21.791	6.855	10.193
1976	5.314	3.777	23.110	1.827	24.937	4.693	7.255
1977	2.300	3.598	7.812	1.818	9.630	4.186	5.245
1978	7.648	5.087	6.434	2.436	8.870	1.160	3.346
1979	1.514	3.821	7.837	2.665	10.502	6.938	4.095
1980	2.380	3.847	4.226	2.702	6.928	2.911	3.670
1981	4.613	2.835	2.496	2.715	5.211	1.130	3.660
1982	3.342	3.445	3.199	3.776	6.975	2.087	2.043
1983	2.207	3.387	1.576	3.889	5.465	2.476	1.898
1984	1.331	2.293	1.819	3.910	5.729	4.305	2.956
1985	1.392	1.643	0.932	2.968	3.901	2.802	3.194
1986	1.734	1.486	0.899	3.389	4.288	2.473	3.193
1987	0.878	1.335	1.415	3.313	4.728	5.389	3.554
1988	1.006	1.206	1.122	3.462	4.584	4.557	4.139
1989	0.487	0.790	1.367	5.006	6.372	13.077	7.674
1990	0.707	0.733	1.312	4.748	6.060	8.573	8.735

Year	Southern Fall Survey arithmetic kg/tow	Southern Fall Survey 3-year average	Southern Landings (000'smt)	Southern Discards (000's mt)	Southern total catch (000 mt)	Southern Exploitation Index	Southern Exploitation Index (3 year avg)
1991	0.611	0.602	1.210	2.612	3.822	6.257	9.302
1992	0.465	0.594	1.439	6.343	7.782	16.743	10.524
1993	0.424	0.500	1.014	5.308	6.321	14.926	12.642
1994	0.675	0.521	1.052	1.720	2.772	4.108	11.926
1995	0.516	0.538	1.473	1.329	2.801	5.433	8.156
1996	0.453	0.548	0.719	0.380	1.099	2.426	3.989
1997	1.161	0.710	1.172	2.422	3.595	3.097	3.652
1998	0.214	0.609	1.207	0.740	1.948	9.118	4.880
1999	0.455	0.610	1.404	1.060	2.465	5.420	5.878
2000	0.423	0.364	1.462	0.250	1.712	4.047	6.195
2001	0.642	0.507	1.492	0.138	1.630	2.540	4.002
2002	0.542	0.536	0.673	0.327	1.000	1.846	2.811
2003	0.206	0.463	0.641	0.345	0.986	4.794	3.060
2004	0.154	0.301	0.599	0.616	1.214	7.865	4.835
2005	0.376	0.245	0.411	1.007	1.418	3.772	5.477
2006	0.380	0.304	0.429	0.674	1.103	2.902	4.846
2007	0.857	0.538	0.489	1.545	2.035	2.373	3.015
2008	0.473	0.570	0.653	0.814	1.467	3.099	2.791
2009	1.342	0.891	0.674	0.869	1.543	1.150	2.207
2010	1.045	0.954	0.616	0.737	1.352	1.294	1.848
2011	**1.098**	**1.162**					

In the north, the three year arithmetic mean biomass index, based on the NEFSC spring bottom trawl survey for 2009-2011 (1.98 kg/tow) was above the management threshold (1.27 kg/tow) and below the target (2.54 kg/tow). The exploitation index (catch divided by biomass index for 2010 (0.15 kt/kg) was below the threshold (0.16 kt/kg; Figure 7). In the south, the three year arithmetic mean biomass index, based on the NEFSC spring bottom trawl survey for 2009-2011 (1.16 kg/tow) was above the management threshold (0.51 kg/tow) and above the target (1.02 kg/tow; Figure 8). The exploitation index (catch divided by biomass index for 2010 (1.29 kt/kg) was below the threshold (3.04 kt/kg; Figure 8). Therefore, based on the accepted SARC 51 reference points, the northern and southern red hake stocks are NOT overfished and overfishing is NOT occurring.

Figure 7. Northern red hake spring survey biomass in kg/tow (top) and relative exploitation ratios (bottom) of the total catch (kt) to the fall survey index with their calculated 3-yr running averages (red lines). The solid lines represent the overfishing thresholds.

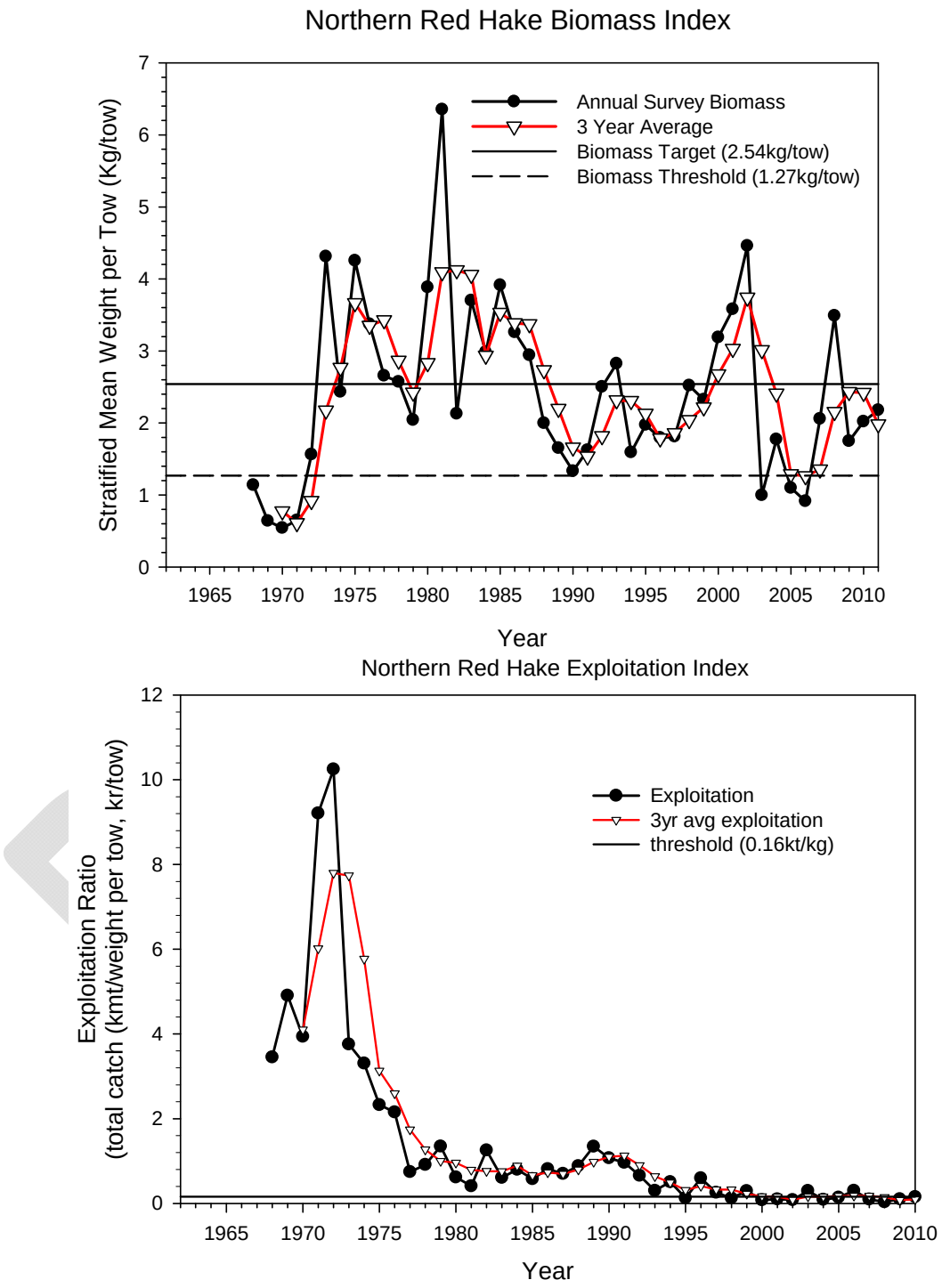
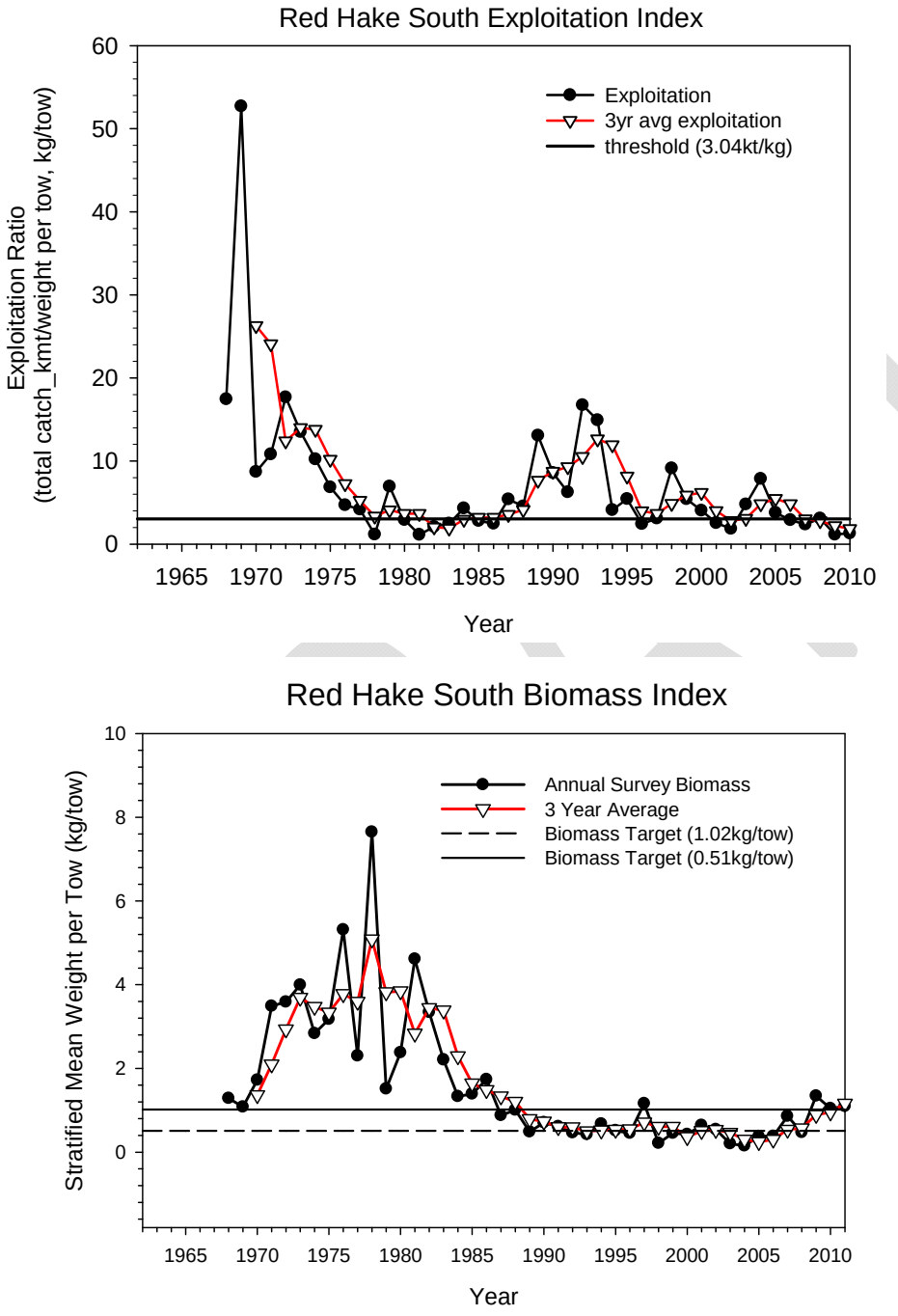


Figure 8. Southern red hake spring survey biomass in kg/tow (top) and relative exploitation ratios (bottom) of the total catch (kt) to the fall survey index with their calculated 3-yr running averages (red lines). The solid lines represent the overfishing thresholds.



7.1.2.3 Offshore hake

The new 2010 assessment concluded that information was not available to determine stock status for offshore hake because fishery data were insufficient and the survey data are not considered to reflect stock trends. It was not possible to recommend a reference points for offshore hake and the overfished and overfishing status of offshore hake is therefore unknown.

7.1.3 Landings and discards of non-target species on trips in the fishery

Information about the absolute level of bycatch species in the directed small-mesh multispecies fishery could not be determined due to difficulties of determining an appropriate trip definition for the hake fishery. Many factors were explored in attempt to define an observed hake trip, specifically regulated mesh size and possession limits for years 2000-2004. However, these factors were not sufficient to define "directed" small-mesh multispecies trips. This insufficiency results in trips that did target small-mesh multispecies being excluded, with potentially significant impacts. For the purpose of this exercise, bycatch species were determined using a broad definition of all trips (directed and non-directed) that caught small-mesh multispecies in the trawl fishery by mesh-size groups. Mesh size was grouped into three categories in an attempt to crudely disaggregate which trips are believed to most likely target small-mesh multispecies based on mesh regulations for the exempted area programs. The mesh groups include: <2.5-inch mesh (often trips targeting other species like herring, shrimp, and squid), 2.5-4.5-inch mesh (often trips targeting small-mesh multispecies), and > 4.5-inch mesh (often trips targeting other species like regulated groundfish, black sea bass, and summer flounder). In the southern area, trips that caught offshore hake were included with silver hake trips to account for mixed landings of whiting in the southern management area. In the analysis, mesh-size group 2.5-4.5-inches was used as a proxy for trips that are most likely to "target" small-mesh multispecies. However, it is also recognized that there are some overlaps with other targeted fisheries (i.e., the squid, mackerel, and butterfish fishery) within this category.

Table 18 – Table 33 provide a list of the most frequent discarded species or species group that comprised <1% or more of the discards on observed trips that caught either silver hake or red hake during 2004 - 2010 by management area based on data from the NEFSC Observer Program. Note the small-mesh multispecies resources are included in the list (grayed out in Table 18- Table 33). Across both stock areas, discards include the skate complex (*Raja eglanteria, Luecoraja erinacea, Leucoraja garmani, Malacoraja senta, Ambiraja radiate, Leucoraja ocellata*), dogfish (*Squalus acanthias*), fluke (*Paralicthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), yellowtail flounder (*Limanada ferriginea*), American plaice (*Hippoglossoides platessoides*), witch flounder (*Glyptocephalus cynoglossus*), red hake (*Urophycis chuss*), silver hake (*Merluccidae billinearis*), scup (*Stenotomus chrysops*), black sea bass (*Centropristis striata*), monkfish (*Lophius americanus*), cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), red crab (*Chaceon quinquedens*), scallops (*Placopecten magellanicus*), squid (*Loligo pealeii, Illex illecebrosus*), butterfish (*Peprilus triacanthus*), mackerel (*Scomber scombrus*), and redfish (*Sebastes fasciatus*).

The proportion of observed catches that were discarded by total weight on trips that were likely to target either red or silver hake were fairly similar regardless of stock area, but lower for other mesh-size groupings, with the exception of large the mesh fishery (>4.5 inches) in the southern region. In the northern area, for 2004-2010, 38% of observed catches were discarded on trips that were likely to target silver hake (Table 20), and 40% of total catches were discarded on trips that were likely directed towards red hake (Table 21). During the same time period, discards of all species caught in the trips that likely targeted silver hake or red hake in the southern area represented 31% and 36% of the observed catch for

these fisheries, respectively. For trips that likely targeted small-mesh multispecies, the majority of discards consisted of the small-mesh groundfish species complex (silver hake, offshore hake, and red hake). In the northern area, approximately 21-22% of the small-mesh multispecies catches were discarded (Table 20-Table 21) and in the southern area, 23-27% (Table 28-Table 29) of small-mesh multispecies were discarded. Other frequently discarded species on trips that caught small-mesh multispecies (i.e., trips with trawl mesh size < 2.5 inches or > 4.5 inches, as well as other gear types) include dogfish in the northern stock area, the squid, mackerel, and butterfish complex in the southern stock area, and skates in both the northern and southern stock areas (Table 18-Table 33). Because we are unable to definitively identify "targeted" small-mesh multispecies trips, it is difficult to assign discards to particular fisheries. For example, skates and dogfish catch would be uninformative, as those species are also often caught incidentally (and with a relatively high trip limit) to trips directing on higher value, lower trip limit species. If we were to say a trip is a directed skate trip because of a relatively high proportion of its landings are skates, it is likely not accurate because the trip could have been targeting a lower landing limit of cod (a higher value species). Because of this, it would be difficult to tease out of the data that the lower landing limit, higher value species is, in fact, the target.

In the following tables (Table 18-Table 33), "Pct Discard (Overall)" represents the discard weight (lb) of that species divided by the total discard weight across all species. "Pct Discard (Sp)" represents the percentage of the catch (Kept + Discards) of a species that was discarded from trips that caught silver hake.

Table 18. **Northern Silver Hake** (Mesh < 2.5 Inches): Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught silver hake in the northern management area for mesh size < 2.5 inches, from the NEFSC OBDBS Program (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Dogfish	29,973	103,177	133,150	77%	32%
Groundfish, Small-Mesh	272,919	39,646	312,566	13%	12%
Groundfish, Large-Mesh	2,581	22,893	25,474	90%	7%
Silver Hake	217,275	19,996	237,271	8%	6%
Red Hake	55,588	19,650	75,238	26%	6%
Skate	-	19,086	19,086	100%	6%
Herring	64,237	17,542	81,779	21%	5%
Squid, Mackerel, Butterfish	8,899	11,873	20,773	57%	4%
General *Alosa*	4,160	9,194	13,354	69%	3%
Winter Flounder	-	7,233	7,233	100%	2%
American Plaice	-	6,759	6,759	100%	2%
River Herring	774	5,399	6,173	87%	2%
Mackerel	855	4,838	5,693	85%	1%
Yellowtail Flounder	10	4,651	4,661	100%	1%
Butterfish	4,104	4,499	8,603	52%	1%
Alewife	170	3,442	3,612	95%	1%
Unknown Herring	3,124	3,398	6,522	52%	1%
Illex	915	2,004	2,918	69%	1%

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Blueback Herring	604	1,957	2,561	76%	1%
Other Species	5,569	8,011	13,580	59%	3%
Total	671,757	315,248	987,005	32%	NA

Table 19. **Northern Red Hake** (Mesh < 2.5 Inches): Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught red hake in the northern management area for mesh size <2.5 inches, from the NEFSC Program database (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Dogfish	24,983	96,355	121,338	79%	31%
Groundfish, Small-Mesh	266,406	39,301	305,708	13%	13%
Groundfish, Large-Mesh	1,524	22,055	23,579	94%	7%
Silver Hake	210,762	19,651	230,413	9%	6%
Red Hake	55,588	19,650	75,238	26%	6%
Skate	-	18,290	18,290	100%	6%
Herring	63,386	17,412	80,798	22%	6%
Squid, Mackerel, Butterfish	8,062	11,629	19,691	59%	4%
General *Alosa*	4,110	9,013	13,123	69%	3%
Winter Flounder	-	6,824	6,824	100%	2%
American Plaice	-	6,560	6,560	100%	2%
River Herring	771	5,284	6,054	87%	2%
Mackerel	855	4,838	5,693	85%	2%
Yellowtail Flounder	10	4,618	4,628	100%	1%
Butterfish	4,042	4,331	8,373	52%	1%
Unknown Herring	3,077	3,348	6,425	52%	1%
Alewife	167	3,327	3,494	95%	1%
Illex	915	1,975	2,889	68%	1%
Blueback Herring	604	1,957	2,561	76%	1%
Other Species	3,726	7,693	11,419	67%	3%
Total	648,985	304,112	953,096	32%	NA

Table 20. **Northern Silver Hake** (Mesh 2.5-4.5 Inches): Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught silver hake in the northern management area for mesh size range between 2.5 and 4.5 inches, from the NEFSC Program database (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Groundfish, Small-Mesh	545,261	198,314	743,574	27%	21%
Skate	8,121	164,917	173,038	95%	18%
Silver Hake	495,773	147,747	643,520	23%	16%
Dogfish	10,422	73,823	84,245	88%	8%
Groundfish, Large-Mesh	77,593	60,668	138,261	44%	7%
Herring	38,062	60,559	98,621	61%	7%
Red Hake	49,160	50,542	99,701	51%	5%
Squid, Mackerel, Butterfish	15,388	22,333	37,721	59%	2%
Winter Flounder	557	21,604	22,161	97%	2%
Yellowtail Flounder	524	13,397	13,921	96%	1%
American Plaice	15,623	12,854	28,477	45%	1%
Butterfish	8,112	11,304	19,416	58%	1%
Fluke, Scup, Black Sea Bass	486	9,532	10,018	95%	1%
Fluke	479	9,527	10,006	95%	1%
Illex	376	7,749	8,125	95%	1%
Monkfish	115,323	7,654	122,976	6%	1%
Haddock	6,096	4,890	10,986	45%	1%
Other Species	62,906	25,083	87,989	29%	3%
Total	1,450,259	902,496	2,352,755	38%	NA

Table 21. Northern Red Hake (Mesh 2.5-4.5 Inches): Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught red hake in the northern management area for mesh size range between 2.5 and 4.5 inches, from the NEFSC Program database (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Groundfish, Small-Mesh	527,119	197,298	724,416	27%	22%
Skate	1,713	163,293	165,006	99%	18%
Silver Hake	477,631	146,731	624,362	24%	16%
Dogfish	8,846	61,855	70,701	87%	7%
Herring	37,917	60,461	98,378	61%	7%
Groundfish, Large-Mesh	43,206	56,137	99,343	57%	6%
Red Hake	49,160	50,542	99,701	51%	6%
Squid, Mackerel, Butterfish	14,991	22,070	37,060	60%	2%
Winter Flounder	98	20,978	21,076	100%	2%
Yellowtail Flounder	3	12,957	12,960	100%	1%

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Butterfish	8,067	11,169	19,236	58%	1%
American Plaice	7,890	10,559	18,449	57%	1%
Fluke, Scup, Black Sea Bass	486	9,385	9,871	95%	1%
Fluke	479	9,380	9,859	95%	1%
Illex	330	7,659	7,989	96%	1%
Monkfish	69,172	6,819	75,991	9%	1%
Haddock	1,207	4,870	6,077	80%	1%
Other Species	41,745	23,146	64,891	36%	3%
Total	1,290,057	875,307	2,165,364	40%	NA

Table 22. **Northern Silver Hake** (Mesh 4.5 Inches): Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught silver hake in the northern management area for mesh size greater than 4.5 inches, from the NEFSC Program database (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Skate	5,319,058	15,531,636	20,850,694	74%	63%
Groundfish, Large-Mesh	23,700,480	2,399,490	26,099,970	9%	10%
Dogfish	67,352	1,823,470	1,890,821	96%	7%
Cod	4,028,453	705,852	4,734,305	15%	3%
Monkfish	6,513,241	466,669	6,979,910	7%	2%
Haddock	5,801,800	384,633	6,186,433	6%	2%
American Plaice	1,870,113	358,488	2,228,601	16%	1%
Fluke, Scup, Black Sea Bass	35,887	279,791	315,678	89%	1%
Fluke	35,853	279,594	315,447	89%	1%
Yellowtail Flounder	652,492	216,669	869,161	25%	1%
Redfish	1,477,410	188,120	1,665,530	11%	1%
Windowpane	11,887	160,987	172,875	93%	1%
Groundfish, Small-Mesh	21,638	157,841	179,479	88%	1%
Witch Flounder	1,740,960	148,353	1,889,313	8%	1%
Silver Hake	14,557	93,318	107,874	87%	0%
Red Hake	7,017	62,853	69,870	90%	0%
Other Species	8,345,849	690,582	9,036,431	8%	3%
Total	59,622,473	23,792,175	83,414,648	29%	NA

Table 23. **Northern Red Hake** (Mesh 4.5 Inches):Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught red hake in the northern management area for mesh size greater than 4.5 inches, from the NEFSC Program database (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Skate	3,612,312	10,695,964	14,308,276	75%	65%
Groundfish, Large-Mesh	14,923,343	1,564,081	16,487,424	9%	9%
Dogfish	36,008	1,166,609	1,202,617	97%	7%
Cod	2,560,364	431,717	2,992,081	14%	3%
Monkfish	3,924,702	285,250	4,209,953	7%	2%
Haddock	3,982,135	267,611	4,249,746	6%	2%
American Plaice	1,111,375	248,059	1,359,434	18%	1%
Fluke, Scup, Black Sea Bass	24,573	177,719	202,292	88%	1%
Fluke	24,545	177,554	202,099	88%	1%
Groundfish, Small-Mesh	16,063	133,136	149,199	89%	1%
Redfish	1,038,866	132,809	1,171,675	11%	1%
Yellowtail Flounder	444,145	127,356	571,501	22%	1%
Windowpane	8,602	105,638	114,240	92%	1%
Witch Flounder	1,109,369	97,112	1,206,481	8%	1%
Silver Hake	8,777	68,442	77,218	89%	0%
Red Hake	7,222	63,168	70,390	90%	0%
Other Species	4,832,168	480,529	5,312,697	9%	3%
Total	37,648,570	16,091,143	53,739,714	30%	NA

Table 24 Species comprising <1% (in red font) or more of all observed discards, aggregated across other gear groups (shrimp trawl, gillnet, and scallop dredge) for trips (directed and non-directed) that caught silver hake in the northern management area, from the NEFSC Program database (2004 -2010).

Northern Silver Hake Other Gears (All Mesh Categories)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Dogfish	516,059	1,288,709	1,804,768	71%	47%
Scallops	5,583,406	437,184	6,020,591	7%	16%
Skate	70,495	397,593	468,088	85%	15%
Groundfish, Large-Mesh	2,685,099	145,624	2,830,723	5%	5%
Monkfish	168,584	82,004	250,588	33%	3%
Cod	798,816	41,282	840,099	5%	2%
Pollock	1,421,239	34,524	1,455,763	2%	1%
Winter Flounder	14,907	25,398	40,305	63%	1%
Groundfish, Small-Mesh	8,624	17,894	26,518	67%	1%
Silver Hake	7,326	12,528	19,854	63%	0%
Red Hake	1,174	5,284	6,458	82%	0%

Northern Silver Hake Other Gears (All Mesh Categories)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Other Species	484,431	124,485	608,916	20%	5%
Total	11,751,661	2,594,697	14,346,357	18%	NA

Table 25 Species comprising <1% (in red font) or more of all observed discards, aggregated across other gear groups (shrimp trawl, gillnet, and scallop dredge) for trips (directed and non-directed) that caught red hake in the northern management area, from the NEFSC Program database (2004 -2010).

Northern Red Hake Other Gears (All Mesh Categories)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Dogfish	158,019	452,750	610,768	74%	31%
Scallops	4,367,243	356,307	4,723,550	8%	25%
Skate	21,980	313,594	335,573	93%	22%
Monkfish	68,713	77,356	146,069	53%	5%
Groundfish, Large-Mesh	928,149	67,877	996,027	7%	5%
Winter Flounder	6,142	19,899	26,041	76%	1%
Pollock	510,270	14,539	524,809	3%	1%
Groundfish Small Mesh	4,155	12,439	16,594	75%	1%
Yellowtail Flounder	1,977	8,807	10,784	82%	1%
Silver Hake	2,780	6,696	9,475	71%	0%
Red Hake	1,279	5,661	6,940	82%	0%
Other Species	193,666	60,724	254,390	24%	4%
Total	6,488,628	1,391,312	7,879,939	18%	NA

Table 26. Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught silver hake in the southern management area for mesh size < 2.5 inches, from the NEFSC Program database (2004 -2010).

Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Squid, Mackerel, Butterfish	15,448,841	1,381,682	16,830,523	8%	21%
Groundfish, Small-Mesh	949,017	831,921	1,780,937	47%	12%
Dogfish	35,614	582,134	617,748	94%	9%
Butterfish	82,100	554,129	636,229	87%	8%
Silver Hake	902,473	507,996	1,410,468	36%	8%
Illex	9,800,687	495,727	10,296,414	5%	7%
Red Hake	44,770	323,125	367,896	88%	5%
Skate	4,209	285,960	290,169	99%	4%
Fluke, Scup, Black Sea Bass	204,634	274,259	478,893	57%	4%
Loligo	5,458,945	166,864	5,625,809	3%	3%
Scup	78,505	159,069	237,574	67%	2%

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Mackerel	88,760	158,918	247,679	64%	2%
Groundfish, Large-Mesh	9,400	104,846	114,246	92%	2%
Fluke	114,409	93,918	208,327	45%	1%
General *Alosa*	32,314	92,494	124,808	74%	1%
Herring	793,439	66,675	860,113	8%	1%
Unknown Herring	4,186	56,757	60,943	93%	1%
Monkfish	54,492	47,496	101,988	47%	1%
Winter Flounder	580	37,621	38,201	98%	1%
Scallops	10,220	35,213	45,433	78%	1%
Other Species	130,689	200,201	330,890	61%	3%
Total	34,248,283	6,457,004	40,705,288	16%	NA

Table 27. Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught red hake in the southern management area for mesh size <2.5 inches, from the NEFSC Program database (2004 -2010).

Species	Kept (lb)	Discard (lb)	Grand Total (lb)	Pct Discard (Sp)	Pct Discard (Overall)
Squid, Mackerel, Butterfish	9,198,927	858,313	10,057,240	9%	19%
Groundfish, Small-Mesh	827,473	701,198	1,528,671	46%	16%
Silver Hake	780,885	376,637	1,157,523	33%	8%
Butterfish	45,585	369,776	415,361	89%	8%
Dogfish	22,978	345,752	368,730	94%	8%
Red Hake	44,823	323,779	368,602	88%	7%
Illex	5,969,498	285,418	6,254,916	5%	6%
Skate	1,822	192,553	194,376	99%	4%
Fluke, Scup, Black Sea Bass	127,286	146,845	274,131	54%	3%
Mackerel	24,238	106,597	130,834	81%	2%
Loligo	3,143,807	88,837	3,232,645	3%	2%
Groundfish, Large-Mesh	3,796	69,957	73,754	95%	2%
Scup	41,346	68,250	109,596	62%	2%
Fluke	76,387	62,538	138,925	45%	1%
Herring	203,092	40,420	243,512	17%	1%
Monkfish	41,461	34,001	75,462	45%	1%
General *Alosa*	12,488	32,967	45,455	73%	1%
Scallops	6,351	26,759	33,110	81%	1%
Other Species	64,252	155,644	219,896	71%	4%
Total	20,636,496	4,286,241	24,922,737	17%	NA

Table 28. Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught silver hake in the southern management area for mesh size range between 2.5 and 4.5 inches, from the NEFSC Program database (2004 -2010).

Southern Silver Hake (2..5-4.5 Inches)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Groundfish, Small-Mesh	1,313,028	476,629	1,789,657	27%	23%
Red Hake	65,831	285,951	351,782	81%	14%
Dogfish	19,098	245,006	264,105	93%	12%
Skate	4,920	202,153	207,073	98%	10%
Silver Hake	1,238,245	190,657	1,428,901	13%	9%
Fluke, Scup, Black Sea Bass	129,944	92,556	222,500	42%	5%
Squid, Mackerel, Butterfish	743,079	92,158	835,237	11%	4%
Groundfish, Large-Mesh	20,499	71,348	91,847	78%	3%
Scup	66,986	59,021	126,006	47%	3%
Illex	2,389	52,490	54,879	96%	3%
Butterfish	14,841	26,860	41,700	64%	1%
Fluke	27,922	24,072	51,993	46%	1%
Haddock	2,191	24,041	26,232	92%	1%
Monkfish	23,169	22,113	45,282	49%	1%
Witch Flounder	133	12,509	12,642	99%	1%
Redfish	243	10,512	10,755	98%	1%
General *Alosa*	1,232	10,326	11,558	89%	1%
Other Species	772,536	77,756	850,292	9%	4%
Total	4,446,285	1,976,156	6,422,441	31%	NA

Table 29 Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught red hake in the southern management area for mesh size range between 2.5 and 4.5 inches, from the NEFSC Program database (2004 -2010).

Southern Red Hake (2.5-4.5 Inches)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Groundfish, Small-Mesh	1,175,650	448,353	1,624,003	28%	27%
Red Hake	65,831	285,951	351,782	81%	17%
Skate	3,555	170,425	173,980	98%	10%
Silver Hake	1,100,867	162,380	1,263,247	13%	10%
Dogfish	14,276	122,322	136,598	90%	7%
Squid, Mackerel, Butterfish	171,009	78,516	249,525	31%	5%
Groundfish, Large-Mesh	19,961	64,704	84,665	76%	4%
Illex	1,010	49,063	50,073	98%	3%
Fluke, Scup, Black Sea Bass	42,927	31,262	74,189	42%	2%

Southern Red Hake (2.5-4.5 Inches)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Haddock	2,191	23,886	26,077	92%	1%
Butterfish	11,543	20,369	31,912	64%	1%
Scup	22,397	17,243	39,640	43%	1%
Monkfish	19,562	16,675	36,237	46%	1%
Fluke	17,107	12,636	29,743	42%	1%
General *Alosa*	1,189	9,840	11,028	89%	1%
Redfish	143	9,656	9,799	99%	1%
Witch Flounder	125	8,890	9,015	99%	1%
Winter Flounder	518	8,546	9,064	94%	1%
Other Species	165,553	47,704	213,257	22%	3%
Total	2,835,412	1,588,420	4,423,832	36%	NA

Table 30 Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught silver hake in the southern management area for mesh size greater than 4.5 inches, from the NEFSC Program database (2004 -2010).

Southern Silver Hake (Mesh > 4.5 Inches)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Skate	5,119,903	12,453,871	17,573,775	71%	63%
Groundfish, Large-Mesh	7,741,493	1,360,094	9,101,586	15%	7%
Dogfish	45,081	1,100,000	1,145,080	96%	6%
Fluke, Scup, Black Sea bass	1,997,872	957,238	2,955,110	32%	5%
Fluke	1,176,211	752,772	1,928,983	39%	4%
Windowpane	45,058	478,569	523,626	91%	2%
Yellowtail Flounder	3,361,626	415,506	3,777,132	11%	2%
Haddock	2,578,497	217,090	2,795,587	8%	1%
Monkfish	2,373,639	216,973	2,590,612	8%	1%
Red Crab	2,759	211,318	214,077	99%	1%
Groundfish, Small-Mesh	88,089	198,943	287,032	69%	1%
Scup	725,804	169,613	895,417	19%	1%
Scallops	419,208	162,783	581,991	28%	1%
Red Hake	6,595	127,581	134,176	95%	1%
Silver Hake	81,358	70,838	152,196	47%	0%
Other Species	2,129,145	488,804	2,617,949	19%	3%
Total	27,810,979	19,311,155	47,122,133	41%	NA

Table 31 Species comprising <1% (in red font) or more of all observed trawl discards from trips (directed and non-directed) that caught red hake in the southern management area for mesh size greater than 4.5 inches, from the NEFSC Program database (2004 -2010).

Southern Red Hake (Mesh > 4.5 Inches)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Skate	3,348,780	9,578,227	12,927,007	74%	66%
Groundfish, Large-Mesh	5,905,964	1,010,393	6,916,356	15%	7%
Fluke, Scup, Black Sea Bass	694,675	613,152	1,307,827	47%	4%
Fluke	410,784	543,993	954,777	57%	4%
Dogfish	27,147	485,902	513,049	95%	3%
Windowpane	30,233	363,897	394,129	92%	3%
Yellowtail Flounder	2,771,142	312,216	3,083,358	10%	2%
Groundfish, Small-Mesh	78,556	186,415	264,971	70%	1%
Haddock	1,806,250	169,791	1,976,040	9%	1%
Monkfish	1,576,626	165,144	1,741,770	9%	1%
Red Hake	6,613	127,753	134,366	95%	1%
Silver Hake	71,825.06	58,328.72	130,153.78	45%	0%
Scallops	343,693	117,346	461,039	25%	1%
Red Crab	-	92,235	92,235	100%	1%
Other Species	1,688,125	361,823	2,049,948	18%	3%
Total	18,688,588	14,128,284	32,816,872	43%	NA

Table 32 Species comprising <1% (in red font) or more of all observed discards, aggregated across other gear groups (shrimp trawl, gillnet, and scallop dredge) for trips (directed and non-directed) that caught silver hake in the southern management area, from the NEFSC Program database (2004 -2010).

Southern Silver Hake Other Gears (All Mesh Categories)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Skate	54,359	3,324,512	3,378,872	98%	38%
Scallops	59,736,048	3,238,524	62,974,572	5%	37%
Monkfish	615,961	918,620	1,534,581	60%	10%
Groundfish, Large-Mesh	9,564	239,731	249,295	96%	3%
Fluke, Scup, Black Sea Bass	4,949	198,391	203,340	98%	2%
Fluke	4,522	195,354	199,876	98%	2%
Yellowtail Flounder	3,932	124,150	128,082	97%	1%
Dogfish	260	84,309	84,569	100%	1%
Groundfish, Small-Mesh	7,598	55,466	63,064	88%	1%
Red Hake	28	40,545	40,573	100%	0%

Southern Silver Hake Other Gears (All Mesh Categories)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Silver Hake	3,405	13,274	16,679	80%	0%
Other Species	64,703	202,748	267,452	76%	2%
Total	60,501,895	8,581,806	69,083,701	12%	NA

Table 33 Species comprising <1% (in red font) or more of all observed discards, aggregated across other gear groups (shrimp trawl, gillnet, and scallop dredge) for trips (directed and non-directed) that caught red hake in the southern management area, from the NEFSC Program database (2004 - 2010).

Southern Red Hake Other Gears (All Mesh Categories)					
Species	**Kept (lb)**	**Discard (lb)**	**Grand Total (lb)**	**Pct Discard (Sp)**	**Pct Discard (Overall)**
Skate	1,449	2,392,311	2,393,760	100%	38%
Scallops	43,412,689	2,192,236	45,604,925	5%	35%
Monkfish	426,774	715,972	1,142,747	63%	11%
Groundfish, Large-Mesh	9,127	187,173	196,300	95%	3%
Fluke, Scup, Black Sea Bass	2,398	134,815	137,212	98%	2%
Fluke	2,088	132,773	134,861	98%	2%
Yellowtail Flounder	3,744	98,872	102,616	96%	2%
Groundfish, Small-Mesh	7,460	53,289	60,749	88%	1%
Dogfish	-	52,649	52,649	100%	1%
Red Hake	29	41,347	41,376	100%	1%
Silver Hake	3,265	10,302	13,567	76%	0%
Other Species	35,986	127,264	163,250	78%	2%
Total	43,901,744	6,128,701	50,030,445	12%	NA

7.1.4 Protected Resources

There are numerous protected species that inhabit the environment within the Northeast Multispecies FMP management unit and potentially occur in the operations area of the small-mesh multispecies fishery. These species are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. As listed below, seventeen marine mammal, sea turtle, and fish species are classified as endangered, threatened, candidate, or proposed under the ESA. The remaining species listed below are protected by the MMPA and are known to interact with the otter trawl fisheries in the New England and Mid-Atlantic regions.

7.1.4.1 Species Present in the Area

Table 34 lists the species protected either by the ESA, the MMPA, or both, that may be found in the environment that would be utilized by the small-mesh multispecies fishery. Table 34 also includes two

candidate fish species and one proposed fish species (species being considered for listing as an endangered or threatened species, as identified under the ESA.

Candidate species are those petitioned species actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the *Federal Register*. Atlantic sturgeon and cusk are known to occur within the action area of the small-mesh multispecies fisheries and have documented interactions with types of gear used in the small-mesh multispecies fishery.

Table 34. Species, and their status, protected under the endangered species act and marine mammal protection act that may occur in the operations area for the small-mesh multispecies fishery7

Species	Status
Cetaceans	
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Pilot whale (*Globicephala spp.*)	Protected
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered8
Loggerhead sea turtle (*Caretta caretta*) Northwest Atlantic DPS9	Threatened
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*) Gulf of Maine DPS	Endangered
Cusk *(Brosme brosme)*	Candidate
Atlantic sturgeon *(Acipenser oxyrinchus)*	Proposed
Alewife (*Alosa pseudo harengus*)	Candidate
Blueback herring (*Alosa aestivalis*)	Candidate
Pinnipeds	
Harbor seal (*Phoca vitulina*)	Protected
Harp seal (*Phoca groenlandicus*)	Protected

7 MMPA-listed species occurring on this list are only those species that have a history of interaction with similar gear types within the action area of the small mesh multispecies fishery, as defined in the 2011 List of Fisheries.
8 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 among these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.
9 In September 2011, NMFS and U.S. Fish and Wildlife Service listed 9 distinct population segments (DPSs) of loggerhead sea turtles under the ESA.

At this time, Atlantic sturgeon has been proposed for listing under the ESA. A status review for Atlantic sturgeon was completed in 2007. NMFS has concluded that the U.S. Atlantic sturgeon spawning populations comprise five distinct population segments (DPSs) (ASSRT 2007). The Gulf of Maine DPS of Atlantic sturgeon is proposed to be listed as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon are proposed as endangered. On October 6, 2010 (75 FR 61872 and 75 FR 61904), NMFS proposed listing five populations of Atlantic sturgeon along the U.S. East Coast as either threatened or endangered species. A final listing rule is expected by the winter of 2011. Atlantic sturgeon from any of the five DPSs could occur in areas where the small-mesh multispecies fishery operates. Atlantic sturgeon have been captured in small-mesh otter trawl gear, albeit less often than in large mesh otter trawl gear (Stein et al. 2004a, ASMFC 2007).

Candidate species 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 and proposed species. To accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes, the results of those efforts are needed. 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).

7.1.4.2 Species potentially affected by small-mesh multispecies fishery

The fish, sea turtle, cetacean, and pinniped species discussed below have the potential to be affected by the operation of the small-mesh multispecies fishery. Background information on the range-wide status of sea turtle and marine mammal species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and longline types) can be found in a number of published documents. These include:

- Atlantic sturgeon status review (Atlantic Sturgeon Status Review Team 2007)
- Sea turtle status reviews and biological reports (NMFS and USFWS 1995; Marine Turtle Expert Working Group (TEWG) 1998, 2000; NMFS and USFWS 2007a, 2007b, 2007c, 2007d; TEWG (2007);
- Recovery plans for ESA-listed cetaceans and sea turtles (NMFS 2009; NMFS and USFWS 1991a, 1991b, 1992, 2008; NMFS, USFWS, and SEMARNAT, 2011);
- The marine mammal stock assessment reports (e.g., Waring et al. 2010); and
- Other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001).

Additional ESA background information on the range-wide status of these species and a description of critical habitat can be found in a number of published documents including:

- Proposed Listing Determinations for the Distinct Population Segments of Atlantic Sturgeon in the Northeast Region (75 FR 61872; 75 FR 61904);
- Recent sea turtle status reviews and biological reports (NMFS and USFWS 1995, TEWG 2000, NMFS SEFSC 2001, NMFS and USFWS 2007a);
- Loggerhead recovery team report (NMFS and USFWS 2008);
- Status reviews and stock assessments;
- Recovery Plans for the humpback whale (NMFS 1991), right whale (NMFS 1991, NMFS 2005), fin and sei whale (NMFS 1998), fin whale (NMFS 2010); and
- The marine mammal stock assessment report (Waring et al. 2010) and other publications (*e.g.*, Perry *et al.* 1999; Clapham *et al.* 1999; IWC 2001).

7.1.4.2.1 Sea turtles

Loggerhead, leatherback, Kemp's ridley, and green sea turtles occur seasonally in southern New England and mid-Atlantic continental shelf waters north of Cape Hatteras, North Carolina. In general, turtles move up the coast from southern wintering areas as water temperatures warm in the spring (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998a 1998b, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). The trend is reversed in the fall as water temperatures cool. By December, turtles have passed Cape Hatteras, returning to more southern waters for the winter (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). Hard-shelled species are typically observed as far north as Cape Cod whereas the more cold-tolerant leatherbacks are observed in more northern Gulf of Maine waters in the summer and fall (Shoop and Kenney 1992, STSSN database http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp).

On March 16, 2010, NMFS and USFWS published a proposed rule (75 FR 12598) to divide the worldwide population of loggerhead sea turtles into nine DPSs, as described in the 2009 Status Review. Two of the DPSs are proposed to be listed as threatened and seven of the DPSs, including the Northwest Atlantic Ocean DPS, are proposed to be listed as endangered. NMFS and the USFWS accepted comments on the proposed rule through September 13, 2010 (75 FR 30769, June 2, 2010). On March 22, 2011 (76 FR 15932), NMFS and USFWS extended the date by which a final determination on the listing action would be made to no later than September 16, 2011. This action was taken to address the interpretation of the existing data on status and trends and its relevance to the assessment of risk of extinction for the Northwest Atlantic Ocean DPS, as well as the magnitude and immediacy of the fisheries bycatch threat and measures to reduce this threat. New information or analyses to help clarify these issues were requested by April 11, 2011.

On September 22, 2011, NMFS and USFWS issued a final rule (76 FR 58868), determining that the loggerhead sea turtle is composed of nine DPSs (as defined in Conant *et al*., 2009) that constitute species that may be listed as threatened or endangered under the ESA. Five DPSs were listed as endangered (North Pacific Ocean, South Pacific Ocean, North Indian Ocean, Northeast Atlantic Ocean, and Mediterranean Sea), and four DPSs were listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southeast Indo-Pacific Ocean, and Southwest Indian Ocean). Note that the Northwest Atlantic Ocean DPS and the Southeast Indo-Pacific Ocean DPS were originally proposed as endangered. The Northwest Atlantic Ocean DPS was determined to be threatened based on review of nesting data available after the proposed rule was published, information provided in public comments on the proposed rule, and further discussions within the agencies. The two primary factors considered were population abundance and population trend. NMFS and USFWS found that an endangered status for the Northwest Atlantic Ocean DPS was not warranted given the large size of the nesting population, that the overall nesting population remains widespread, the trend for the nesting population appears to be stabilizing, and substantial conservation efforts are underway to address threats.

The September 2011 final rule also noted that critical habitat for the two DPSs occurring within the U.S. (Northwest Atlantic Ocean DPS and North Pacific DPS) will be designated in a future rulemaking. Information from the public related to the identification of critical habitat, essential physical or biological features for this species, and other relevant impacts of a critical habitat designation was solicited.

This proposed action only occurs in the Atlantic Ocean. As noted in Conant *et al*. (2009), the range of the four DPSs occurring in the Atlantic Ocean are as follows:

- Northwest Atlantic Ocean DPS – north of the equator, south of 60° N latitude, and west of 40° W longitude;
- Northeast Atlantic Ocean DPS – north of the equator, south of 60° N latitude, east of 40° W longitude, and west of 5° 36' W longitude;
- South Atlantic DPS – south of the equator, north of 60° S latitude, west of 20° E longitude, and east of 60° W longitude;
- Mediterranean DPS – the Mediterranean Sea east of 5° 36' W longitude.

These boundaries were determined based on oceanographic features, loggerhead sightings, thermal tolerance, fishery bycatch data, and information on loggerhead distribution from satellite telemetry and flipper tagging studies. Sea turtles from the Northeast Atlantic Ocean DPS are not expected to be present over the North American continental shelf in U.S. coastal waters, where the small-mesh multispecies fishery occurs (P. Dutton, NMFS, personal communication, 2011). Previous literature (Bowen *et al*. 2004) has suggested that there is the potential, albeit small, for some juveniles from the Mediterranean DPS to be present in U.S. Atlantic coastal foraging grounds. These data should be interpreted with caution; however, as they may be representing a shared common haplotype and lack of representative sampling at Eastern Atlantic rookeries. Given that updated, more refined analyses are ongoing and the occurrence of Mediterranean DPS juveniles in U.S. coastal waters is rare and uncertain, if even occurring at all, for the purposes of this assessment we are making the determination that the Mediterranean DPS is not likely to be present in the action area. Sea turtles of the South Atlantic DPS do not inhabit the action area of the small-mesh multispecies fishery (Conant *et al*. 2009). As such, the remainder of this assessment will only focus on the Northwest Atlantic Ocean DPS of loggerhead sea turtles, listed as threatened.

In general, sea turtles are a long-lived species and reach sexual maturity relatively late (NMFS SEFSC 2001; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Sea turtles are injured and killed by numerous human activities (NRC 1990; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Nest count data are a valuable source of information for each turtle species since the number of nests laid reflects the reproductive output of the nesting group each year. A decline in the annual nest counts has been measured or suggested for four of five western Atlantic loggerhead nesting groups through 2004 (NMFS and USFWS 2007a), however, data collected since 2004 suggests nest counts have stabilized or increased (TEWG 2009). Nest counts for Kemp's ridley sea turtles as well as leatherback and green sea turtles in the Atlantic demonstrate increased nesting by these species (NMFS and USFWS 2007b, 2007c, 2007d).

7.1.4.2.2 Large cetaceans

The most recent Marine Mammal Stock Assessment Report (Waring et al. 2010) reviewed the current population trend for each of these cetacean species within U.S. EEZ waters, as well as providing information on the estimated annual human-caused mortality and serious injury, and a description of the commercial fisheries that interact with each stock in the U.S. Atlantic. Information from the Stock Assessment Report is summarized below.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf of Maine and Georges Bank, to low latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is an oversimplification of species movements, and the complete winter distribution of most species is unclear (Perry et al. 1999, Waring et al. 2009). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002,

Patrician et al. 2009). Blue whales are most often sighted on the east coast of Canada, particularly in the Gulf of St. Lawrence, and occurs only infrequently within the U.S. EEZ (Waring et al. 2002).

In comparison to the baleen whales, sperm whale distribution occurs more on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2007). However, sperm whales distribution in U.S. EEZ waters also occurs in a distinct seasonal cycle (Waring et al. 2007). Typically, sperm whale distribution is concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the Mid-Atlantic Bight (Waring et al. 2007). Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 2010).

For North Atlantic right whales, the available information suggests that the population is increasing at a rate of 2.1 percent per year during 1990-2005, and the number of North Atlantic right whales was estimated to be at least 361 animals in 2005 (Waring et al. 2010). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 2.8 per year during 2004 to 2008 (Waring et al. 2010). Of these, 0.8 per year resulted from fishery interactions.

The North Atlantic population of humpback whales is estimated to be 11,570 (Waring et al. 2010). The best estimate for the Gulf of Maine stock of humpback whales is 847 whales (Waring et al. 2010). The population trend was considered positive for the Gulf of Maine population, but there are insufficient data to estimate the trend for the larger North Atlantic population. Based on data available for selected areas and time periods, the minimum population estimates for other western north Atlantic whale stocks are: 3,269 fin whales; 208 sei whales; 4,804 sperm whales; and 3,312 minke whales (Waring et al. 2010). No recent estimates are available for blue whale abundance. Insufficient data exist to determine trends for any other large whale species.

The Atlantic Large Whale Take Reduction Plan was recently revised with publication of a new final rule (72 FR 57104, October 5, 2007) that is intended to continue to address entanglement of large whales (right, humpback, fin, and minke) in commercial fishing gear and to reduce the risk of death and serious injury from entanglements that do occur. NMFS expects to propose changes to right whale critical habitat in the near future. On October 5, 2010, NMFS published a notice of a 90-day petition finding and notice of 12-month determination in the *Federal Register* related to right whale critical habitat. NMFS was already conducting an ongoing analysis and evaluation of new information not available at the time of the original 1994 critical habitat designation prior to the receipt of this petition. Three critical habitat areas currently exist, established in 1994, two of which occur in the northeast region: feeding grounds in Cape Cod Bay and the Great South Channel.

7.1.4.2.3 Small cetaceans

Numerous small cetacean species (dolphins; pygmy and dwarf sperm whales; pilot and beaked, whales; and the harbor porpoise) occur within the area from Cape Hatteras through the Gulf of Maine. Seasonal abundance and distribution of each species in mid-Atlantic, Georges Bank, and/or Gulf of Maine waters varies with respect to life history characteristics. Some species primarily occupy continental shelf waters (e.g., white sided dolphins, harbor porpoise), while others are found primarily in continental shelf edge and slope waters (e.g., Risso's dolphin, pilot whales), and still others occupy all three habitats (e.g., common dolphin, spotted dolphins, striped dolphins). Information on the western North Atlantic stocks of each species is summarized in Waring et al. (2010).

With respect to harbor porpoise, the most recent Stock Assessment Reports show that the number of harbor porpoise takes in U.S. fisheries (877+ animals/year from 2004-2008) exceed this stocks Potential Biological Removal (PBR) level calculated for this species (i.e. 703 animals) and is, therefore, a strategic

stock. Observer information collected from January 2005 to June 2006 has indicated an increase in porpoise bycatch throughout the geographic area covered by the Harbor Porpoise Take Reduction Plan in both the Gulf of Maine and Mid-Atlantic regions, and in monkfish gear specifically. The Harbor Porpoise Take Reduction Team developed options to reduce takes, and NMFS published a proposed rule on July 21, 2009 (74 *Federal Register* 36058) with four alternatives including no action. The comment period on this rule ended on August 20, 2009 and the final rule was published on February 19, 2010 (75 *Federal Register* 7383).

The following changes were implemented in the 2010 amendments to the Harbor Porpoise Take Reduction Plan:

New England

- Expand the size of the Massachusetts Bay Management Area, as well as pinger use to include November;
- Establish the Stellwagen Bank Management Area and require pingers from November 1 through May 31;
- Establish the Southern New England Management Area where pingers are required from December 1 through May 31; and
- Establish the Cape Cod South Expansion Consequence Closure Area and Coastal Gulf of Maine Consequence Closure Area. These areas would be closed to gillnetting for two to three months if harbor porpoise bycatch levels are too high.

Mid-Atlantic

- Establish the Mudhole South Management Area, with a seasonal closure and gear modifications for large and small mesh gear;
- Modify the northern boundary of the waters off New Jersey Management Area to intersect with the southern shoreline of Long Island, NY at 72° 30' W longitude; and
- Modify tie-down spacing requirement for large mesh gillnets in all Mid-Atlantic management areas (waters off New Jersey, Mudhole North and South, and Southern Mid-Atlantic Management Areas).

The Atlantic Trawl Gear Take Reduction Team was organized in 2006 to implement a plan to address the incidental mortality and serious injury of long-finned pilot whales, short-finned pilot whales, common dolphins, and Atlantic white-sided dolphins in several trawl gear fisheries. In lieu of a take reduction plan, the Atlantic Trawl Gear Take Reduction Team agreed to develop an Atlantic Trawl Gear Take Reduction Strategy. The Atlantic Trawl Gear Take Reduction Strategy identifies informational and research tasks as well as education and outreach needs the Atlantic Trawl Gear Take Reduction Team believes are necessary to provide the basis for achieving the ultimate MMPA goal of achieving a zero mortality rate. The Atlantic Trawl Gear Take Reduction Strategy also identifies several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. These voluntary measures are as follows:

- Reducing the numbers of turns made by the fishing vessel and tow times while fishing at night; and
- Increasing radio communications between vessels about the presence and/or incidental capture of a marine mammal to alert other fishermen of the potential for additional interactions in the area.

7.1.4.2.4 Pinnipeds

Of the four species of seals expected to occur in the area, harbor seals have the most extensive distribution with sightings occurring as far south as 30° N (Katona et al. 1993, Waring et al. 2009). Gray seals are the second most common seal species in U.S. EEZ waters, occurring primarily in New England (Katona et al. 1993; Waring et al. 2009). Pupping for both species occurs in both U.S. and Canadian waters of the western north Atlantic. The majority of harbor seal pupping likely occurs in U.S. waters. The majority of gray seal pupping likely occurs in Canadian waters, although there are at least three gray seal pupping colonies in U.S. waters as well. Harp and hooded seals are less commonly observed in U.S. EEZ waters. Both species form aggregations for pupping and breeding off eastern Canada in the late winter/early spring, and then travel to more northern latitudes for molting and summer feeding (Waring et al. 2007). Both species have a seasonal presence in U.S. waters from Maine to New Jersey, based on sightings, stranding, and fishery bycatch (Waring et al. 2009).

7.1.4.2.5 Atlantic sturgeon DPSs

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that sub-adult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b; ASMFC 2007; Dunton et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC 2007, Dunton et al. 2010). Information on population sizes for each Atlantic sturgeon DPS is very limited. Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon.

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT 2007). Based on data through 1998, an estimate of 870 spawning adults per year was developed for the Hudson River (Kahnle et al. 2007), and an estimate of 343 spawning adults per year is available for the Altamaha River, GA, based on data collected in 2004-2005 (Schueller and Peterson 2006). Data collected from the Hudson River and Altamaha River studies cannot be used to estimate the total number of adults in either subpopulation, since mature Atlantic sturgeon may not spawn every year, and it is unclear to what extent mature fish in a non-spawning condition occur on the spawning grounds. Nevertheless, since the Hudson and Altamaha Rivers are presumed to have the healthiest Atlantic sturgeon subpopulations within the United States, other U.S. subpopulations are predicted to have fewer spawning adults than either the Hudson or the Altamaha (ASSRT 2007). It is also important to note that the estimates above represent only a fraction of the total population size as spawning adults comprise only a portion of the total population (e.g., this estimate does not include sub-adults and early life stages)

7.1.4.3 Species not likely to be affected

The Gulf of Maine DPS of anadromous Atlantic salmon was initially listed by the USFWS and NMFS as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered

species on June 19, 2009 (74 FR 29344) included an expanded range for the Gulf of Maine DPS of Atlantic salmon.

Presently, the Gulf of Maine DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations. Currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery and Craig Brook National Fish Hatchery. Coincident with the June 19, 2009 endangered listing, NMFS designated critical habitat for the Gulf of Maine DPS of Atlantic salmon (74 FR 29300; June 19, 2009). The critical habitat designation for the Gulf of Maine DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the Gulf of Maine DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the Gulf of Maine DPS in which critical habitat is designated is within the State of Maine.

The action being considered in the EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine DPS of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Shortnose sturgeon and salmon belonging to the Gulf of Maine DPS of Atlantic salmon occur within the general geographical areas fished by the small-mesh multispecies fishery, but they are unlikely to occur in the area where the fishery operates given their numbers and distribution. Therefore, none of these species are likely to be affected by the small-mesh multispecies fishery. The following discussion provides the rationale for these determinations.

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. Shortnose sturgeon can be found in rivers along the western Atlantic coast from St. Johns River, Florida (although the species is possibly extirpated from this system), to the Saint John River in New Brunswick, Canada. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while some northern populations are amphidromous (NMFS 1998b). Since the small-mesh multispecies fishery does not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, it is highly unlikely that the fishery would affect shortnose sturgeon.

The wild populations of Atlantic salmon found in rivers and streams from the lower Kennebec River north to the U.S. - Canada border are listed as endangered under the ESA. These populations include those in the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers and Cove Brook. Juvenile salmon in New England rivers typically migrate to sea in May after a two to three year period of development in freshwater streams, and remain at sea for two winters before returning to their U.S. natal rivers to spawn. Results from a 2001 post-smolt trawl survey in Penobscot Bay and the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid- to late May. Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the approval of this action would affect the Gulf of Maine DPS of Atlantic salmon. Given that operation of the small-mesh multispecies fishery would not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found and small-mesh multispecies gear used by the fleet operates in the ocean at or near the bottom rather than near the water surface, NMFS determines that the small-mesh fishery will not negatively impact the Atlantic Salmon Gulf of Maine DPS. Thus, this species is not considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety

of sponges but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare (NMFS 2009). Since operation of the small-mesh multispecies fishery does not occur in waters that are typically used by hawksbill sea turtles, it is highly unlikely that its operations would affect this turtle species.

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2010). In the North Atlantic, blue whales are most frequently sighted in the St. Lawrence from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program (CeTAP) surveys of the mid- and north Atlantic areas of the outer continental shelf (CeTAP 1982). Calving for the species occurs in low latitude waters outside of the area where the small mesh multispecies fishery operates. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. Given that the species is unlikely to occur in areas where the small-mesh multispecies fishery operates, and given that the operation of the fishery would not affect the availability of blue whale prey or areas where calving and nursing of young occurs, the proposed action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the EEZ. However, the distribution of the sperm whales in the EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2007). In contrast, the small-mesh multispecies fishery would operate in continental shelf waters. The average depth of sperm whale sightings observed during the Cetacean and Turtle Assessment Program surveys was 1,792 m (CeTAP 1982). Female sperm whales and young males almost always inhabit open ocean, deep-water habitat with bottom depths greater than 1000 m and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions. Given that sperm whales are unlikely to occur in areas (based on water depth) where the small-mesh multispecies fishery would operate, and given that the operation of the fishery would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs, the proposed action would not be likely to adversely affect sperm whales.

7.1.4.4 Interactions between gear and protected resources

Although interactions between types of deployed gear and protected species vary, interactions with the directed small-mesh multispecies fishery would generally involve entanglement in mesh (trawls), entanglement in the float line (trawls), entanglement in the groundline (trawls), or entanglement in the vertical lines that connect gear to the surface and surface systems (trawls). Entanglements are assumed to occur with increased frequency in areas where more gear is set and in areas with higher concentrations of protected species.

Although sea turtles have been caught and injured or killed in multiple types of fishing gear, including gillnets and hook-and-line fishing, mortalities from these gear types account for only about 50 percent of the mortalities associated with trawling gear (NMFS 2009b). A study conducted in the mid-Atlantic region showed that bottom trawling accounts for an average annual take of 616 loggerhead sea turtles, although Kemp's ridleys and leatherbacks were also caught during the study period (Murray 2006). The greatest densities of sea turtles generally occur in more temperate waters than those in the small mesh multispecies area.

Interactions between gear and a given species occur when fishing gear overlaps both spatially and trophically with the species' niche. Spatial interactions are more "passive" and involve unintentional interactions with fishing gear. Trophic interactions are more "active" and occur when protected species

attempt to consume prey caught in fishing gear and become entangled in the process. Spatial and trophic interactions can occur with fishing gear used by the small-mesh multispecies fishery throughout the year.

Large and small cetaceans and sea turtles are more prevalent within the operations area during the spring and summer, although they are also relatively abundant during the fall and would have a higher potential for interaction with small mesh multispecies gear during these seasons. Although harbor seals may be more likely to occur in the operations area between fall and spring, harbor and gray seals are year-round residents; therefore, interactions could occur year-round. The uncommon occurrences of hooded and harp seals in the operations area are more likely to occur during the winter and spring, allowing for an increased potential for interactions during the winter.

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for by-caught sturgeon (ASMFC 2007). Sturgeon deaths were rarely reported in the otter trawl observer dataset (ASMFC 2007). However, the level of mortality after release from the gear is unknown (Stein et al. 2004a). In a review of the Northeast Fishery Observer Program (NEFOP) database for the years 2001-2006, observed bycatch of Atlantic sturgeon was used to calculate bycatch rates that were then applied to commercial fishing effort to estimate overall bycatch of Atlantic sturgeon in commercial fisheries. This review indicated sturgeon bycatch occurred in statistical areas abutting the coast from Massachusetts (statistical area 514) to North Carolina (statistical area 635) (ASMFC 2007). Based on the available data, participants in an ASMFC bycatch workshop concluded that sturgeon encounters tended to occur in waters less than 50 m throughout the year, although seasonal patterns exist (ASMFC 2007). The ASMFC analysis determined that an average of 650 Atlantic sturgeon mortalities occurred per year (during the 2001 to 2006 timeframe) in sink gillnet fisheries. Stein et al. (2004a), based on a review of the NMFS Observer Database from 1989-2000, found clinal variation in the bycatch rate of sturgeon in sink gillnet gear with the lowest rates occurring off of Maine and highest rates off of North Carolina for all months of the year.

In an updated analysis, the Northeast Fisheries Science Center (NEFSC) was able to use data from the NEFOP database to provide updated estimates for the 2006 to 2010 timeframe. Data were limited by observer coverage to waters outside the coastal boundary (fzone>0) and north of Cape Hatteras, NC. Sturgeon identified by Federal observers as Atlantic sturgeon, as well as those categorized as unknown sturgeon, were included in the data set. At this time, data were limited to information collected by the NEFOP. Limited data collected in the At-Sea Monitoring Program were not included, although preliminary views suggest the incidence of sturgeon encounters was low. The frequency of encounters in the observer programs was expanded by total landings recorded in fishing vessel trip reports (VTR) rather than dealer data, since the dealer data does not include information on mesh sizes. Generally, the VTR data represent greater than 90 percent of total landings. Data were combined into division (identified as the first two digits in the statistical area codes), quarter, gear type (otter trawl (fish) and sink gillnet) and mesh categories. Mesh sizes were categorized for otter trawl as small (<5.5”) or large (greater than or equal to 5.5”), and small (<5.5”), large (between 5.5” and 8”) and extra-large (>8”) in sink gillnets.

For each cell (year, division, quarter, gear, mesh), the ratio of sturgeon count to total kept weight of all species was calculated. This ratio was then applied to total weight in the cell recorded in the VTR data. No imputation was done at this time to estimate sturgeon in missing cells. Totals are presented for encounters as well as encounters where the observer recorded the fish as dead (a subset of total encounters). The two categories represent bounds of possible sturgeon mortalities. The results should not be considered definitive estimates of Atlantic sturgeon losses until further work can be done to account for missing cells. The NEFSC is undertaking additional analyses to account for the missing cells, which will be available in the near future.

Below, the data for encounter rates by month and statistical area for otter trawl gear strata are presented (Table 35). The expanded estimates of all sturgeon by quarter, division, and year for otter trawl gear are in Table 36. Total estimated dead sturgeon in otter trawl gear are shown in
Table 37. Composite estimates by year and gear type are provided in Table 38**.** Estimated total annual takes ranged from 1,536 to 3,221; estimated annual mortalities ranged from 37 to 376 sturgeon.

Table 35. Encounters of Atlantic sturgeon and unknown sturgeon by month, area and mesh size in otter trawl gear, 2006-2010 combined.

Large mesh otter trawl

area	month 1	2	3	4	5	6	7	8	9	10	11	12
464	0		0		0					0	0	
465	0		0	0		0	0				0	0
511	0		0	0								0
512	0		0	0	0	0	0	0	0	0	0	0
513	0	0	0	0	0	0	0	0	0	0	0	0
514	3	0	0	0	0	0	0	0	0	0	0	0
515	0	0	0	0	0	0	0	0	0	0	0	0
521	0	0	0	0	0	0	0	0	0	0	0	0
522	0	0			0			0	0	0	0	
525				0	0			0				
526	0	0	0	0	0	0	0	0	0	0	0	0
537	0	0	0	0	0	0	0	0	0	0	0	0
538				0	0	0	0	0	0	0	0	
539	0	0	0	0	0	0	0	0	0	0	0	0
562					0			0				
611	0	0	0	0	0	0	0	0	0	0	0	0
612		**1**		0	**25**	**5**	**5**	0	**33**	**1**	0	0
613	0	0	0	**1**	0	0		0	0	0	0	0
614				**1**	0	0	0		0			
615	0		0		0	0	0	0	0		0	0
616	0	0	0	0						0	0	0
621	0	0	0		0	**2**	0	0	**18**	0	0	0
622	0	0	0	0							0	0
623			0	0								
625							0			0	0	0
626	0	0	0	0							0	0
627				0								
631	0	**2**										0
632		0										
635	0											0

small mesh otter trawl

area	month 1	2	3	4	5	6	7	8	9	10	11	12
465									0			
512							0		0		0	
513	0	0				0	0	0	0		0	
514	0	0	0				0	0	0	0	1	0
515	0		0			0	0		0		0	
521	0	0	0				0	0	0	0	0	0
522						0	0	0	0	0		
525	0	0	0	0	0	0	0	0	0	0	0	0
526	0	0	0				0	0	0	0	0	0
533				0								
534									0			
537	0	0	0	0	0	**1**	**1**	0	0	0	0	0
538				0	0	0	0	0	0	0		
539	0	0	0	0	0	1	0	0	0	0	0	0
562	0	0	0		0	0	0	0	0	0	0	0
611	0	0		0	1	0	0	0	0	0	0	0
612	0		0	**6**	**14**	**13**	0	0	**1**	0	0	0
613	0	0	0	0	0	0	**1**	0	0	**1**	**4**	0
614					**1**	**3**	0	0	0	0	0	
615	0	0	0	0	0	0	0	0	0	0	0	0
616	0	0	0	0	0	0	0	0	0	0	0	0
621	0	0	0	0	**3**	**1**	**1**	0	3	9	2	0
622	0	0	0	0	0	0	0	0	0	0	0	0
623	0	0	0	0				0	0	0	0	0
625	4		0			0				**1**	**12**	**2**
626	0	0	0	0		0	0	0	0	0	0	0
627	0	0		0			0	0	0	0		
631	**2**	**2**	**22**	**7**						**1**	**2**	**3**
632	0			0		0	0	0	0	0	0	0
633								0				
635	**10**	**4**	**8**	**1**						0	0	0
636	0	0		0		0	0	0	0	0	0	0

Table 36. All Atlantic sturgeon encounters expanded by VTR landings by division, mesh size, and year for otter trawls (2006 across top row to 2010 across bottom row).

small mesh otter trawl
All sturgeon
Expanded by ratio to VTR landings

	1	2	3	4	
51	0		0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	996	0	184	
62	29	0	8	309	
63	20	0	0	0	1546

	1	2	3	4	
51	0		0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	0	0	0	
62	0	0	0	449	
63	47			40	536

	1	2	3	4	
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	279	80	0	
62	0	21	0	19	
63	19		0	36	454

	1	2	3	4	
51	0		0	22	
52	0	0	0	0	
53	0	0	17	0	
56					
61	0	336	9	0	
62	0	9	48	24	
63	435	0	0	6	907

	1	2	3	4	
51	0		0	0	
52	0	0	0	0	
53	0	39	0	0	
56					
61	0	317	0	0	
62	0	0	0	0	
63	41	36	0	0	433

Large mesh otter trawl
All sturgeon
Expanded by ratio to VTR landings

	1	2	3	4	
51	33				
52	0	0	0	0	
53	0	0	0	0	
61		0	0		
62	0	28	0	0	
63	0	0	0		61

	1	2	3	4	
51	19	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	0	0	0	
62	0	0	252	0	
63	0			0	271

	1	2	3	4	
51		0		0	
52	0	0	0	0	
53	0	0	0	0	
61	44	218	108	22	
62	0	12	0	0	
63	0	0	0	0	404

	1	2	3	4	
51	0	0		0	
52	0	0	0	0	
53	0	0	0	0	
56		0		0	
61	0	113	23	0	
62	0	0	7	0	
63	0				143

	1	2	3	4	
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56		0	0		
61	0	437	601	0	
62	0	0	0	0	
63	172			0	1211

Table 37. Dead Atlantic sturgeon encounters expanded by VTR landings by division, mesh size, and year for otter trawl (2006 across top row to 2010 across bottom row)

small mesh otter trawl
Expanded by ratio to VTR landings
dead sturgeon expanded

		1	2	3	4	
2006	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	61	
	62	29	0	0	0	
	63	0	0	0	0	90
2007	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	4			0	4
2008	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	0		0	0	0
2009	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	19	0	0	0	19
2010	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	7	0	0	0	7

large mesh otter trawl
dead sturgeon expanded
to VTR all kept

2006	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	61	0	0	0	0	
	62	0	0	0	0	
	63	0	0	0	0	0
2007	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56	0	0	0	0	
	61	0	0	0	0	
	62	0	0	59	0	
	63	0	0	0	0	59
2008	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	61	0	36	108	0	
	62	0	0	0	0	
	63	0	0	0	0	145
2009	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56	0	0	0	0	
	61	0	0	0	0	
	62	0	0	0	0	
	63	0	0	0	0	0
2010	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56	0	0	0	0	
	61	0	0	0	0	
	62	0	0	0	0	
	63	0			0	0

Table 38. Summary of Atlantic sturgeon encounters of all fish and total dead, by gear type and year

expanded encounters

	sink gillnet	otter trawl	
2006	1614	1606	3221
2007	1044	807	1851
2008	678	857	1536
2009	1428	1050	2478
2010	347	1644	1991

expanded dead encounters

	sink gillnet	otter trawl	
2006	246	90	336
2007	309	63	373
2008	231	145	376
2009	226	19	245
2010	30	7	37

Total

	encounters	dead
2006	3221	336
2007	1851	373
2008	1536	376
2009	2478	245
2010	1991	37

As illustrated above, for the years 2006 through 2010, an average of approximately 2,215 Atlantic sturgeon were taken by commercial fishing vessels using small and large mesh otter trawls and sink gillnets of varying mesh size (small to extra-large). Of this number of encounters, there were approximately 273 mortalities (12%). The total number of encounters in sink gillnet and otter trawl gear and associated mortalities for quarters 2 and 3 are most relevant for the timeframe of interest for this action. For sink gillnets, an average of 483 and 192 Atlantic sturgeon were encountered in the 2006 to 2010 timeframe in quarters 2 and 3, respectively. Of these, there were 133 (28%) mortalities in quarter 2 and 21 (11%) mortalities in quarter 3. For otter trawls, an average of 439 and 360 were encountered in quarters 2 and 3, respectively. It was not appropriate to average the number of mortalities over the five-year time frame for quarters 2 and 3 given that all mortalities occurred in just two of the five years (2007 and 2008), and these mortalities occurred just in large mesh otter trawl gear (e.g., there were no mortalities in quarters 2 and 3 in small-mesh otter trawl gear). It is important to note that the information provided on mortality rates may be an underestimate as the rate of post-release mortality for those reportedly released alive is unknown.

7.2 Physical Environment and EFH

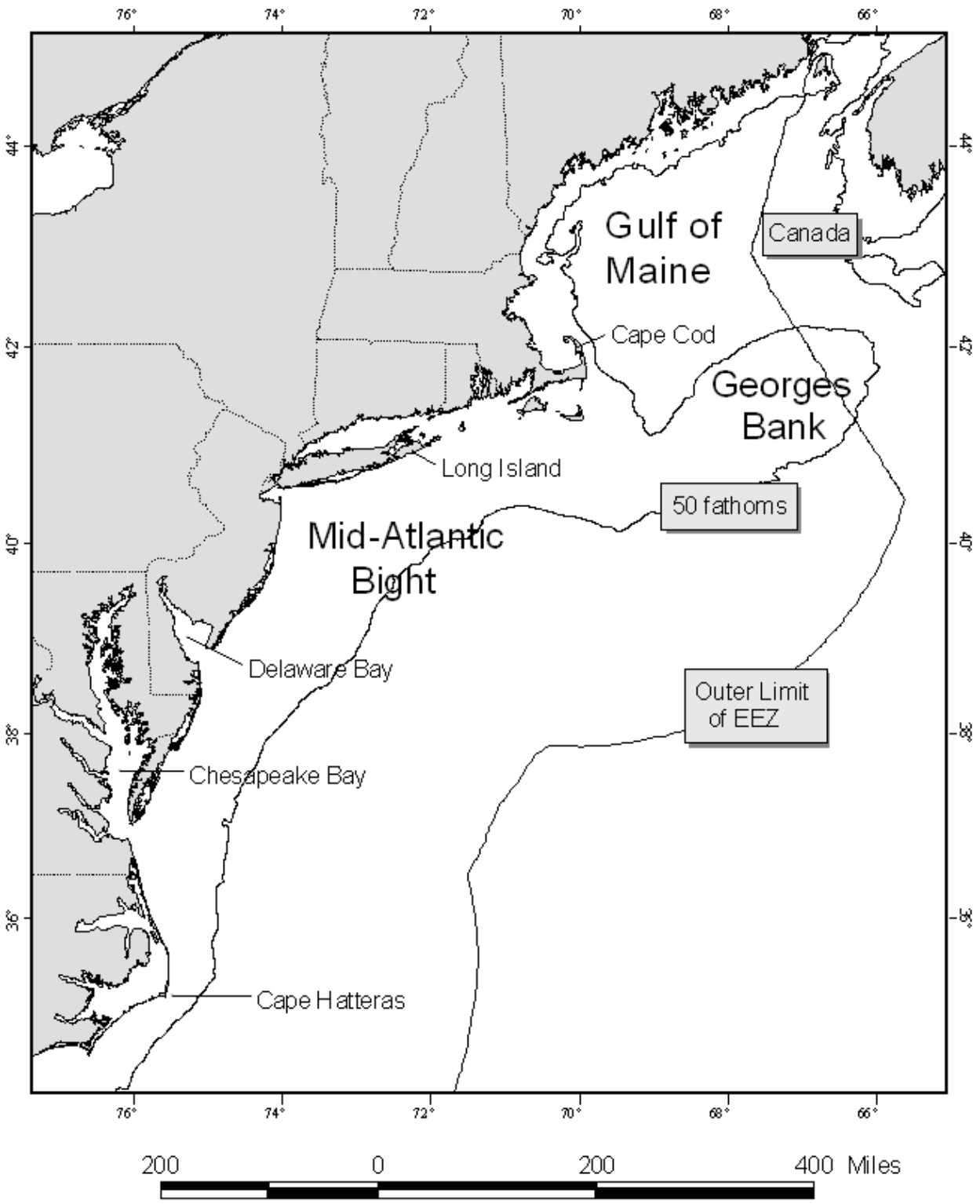
7.2.1 Description of the physical environment and efh of the small-mesh multispecies fishery

The Northeast U.S. Shelf Ecosystem includes 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 to a depth of 2,000 m (Section 7.2.1.1**,** Sherman et al. 1996). Four distinct sub-regions are identified: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The physical oceanography and biota of these regions were described in Northeast Multispecies Amendment 16, Section 6.1. Much of this information was extracted from Stevenson et al. (2004), and the reader is referred to this document and sources referenced therein for additional information. The small-mesh multispecies fishery occurs throughout the Mid-Atlantic Bight, the Gulf of Maine, and Georges Bank. (Figure 3)

The first Essential Fish Habitat Amendment (Amendment 11 to the Northeast Multispecies FMP) in 1998 initially described and identified the essential fish habitat for silver and red hake. The EFH amendment addressed all elements required by the EFH provisions of the Sustainable Fisheries Act. This includes the description and identification of silver and red hake EFH, the threats to EFH from fishing and non-fishing activities, and the conservation and enhancement measures to protect EFH for silver and red hake, which were updated in Amendment 13 to the Northeast Multispecies FMP. EFH for offshore hake was first described and identified in Amendment 12 to the Northeast Multispecies FMP in 2000. The Council is developing a second EFH Omnibus Amendment in two phases. The initial phase reviewed the existing EFH designations and recommends modifications to the current descriptions of EFH for the three small-mesh multispecies. However, the new designations will not be incorporated into the FMP until the completion of Phase II, which is intended to evaluate management measures to address adverse impacts to EFH from fishing. Summaries of EFH descriptions and maps for Northeast region species can be accessed at http://www.nero.noaa.gov/hcd/webintro.html.

The area that may potentially be affected by the proposed action has been identified as EFH for various species that are managed under the Northeast Multispecies; Atlantic Sea Scallop; Monkfish; Deep-Sea Red Crab; Northeast Skate Complex; Atlantic Herring; Summer Flounder, Scup, and Black Sea Bass; Tilefish; Squid, Atlantic Mackerel, and Butterfish; Atlantic Surfclam and Ocean Quahog Fishery Management Plans. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and federal waters throughout the Northeast U.S. Shelf Ecosystem. EFH descriptions of the geographic range, depth, and bottom types for all the benthic life stages of the species managed under these FMPs are summarized in the following table. For more information on the geographic area, depth, and EFH description for each applicable life stage of these species, the reader is referred to Table 46 of Northeast Multispecies Amendment 16 EIS.

Figure 9 Northeast U.S. Shelf Ecosystem



7.2.1.1 Weather

One of the most frequently mentioned physical environmental parameters affecting fishing is the weather. High winds, waves, and extremely low temperatures can create extremely hazardous conditions, ranking commercial fishing among the most dangerous occupations in the world. Section E.6.2.2 of the FSEIS for Amendment 5 to the Northeast Multispecies FMP contains a complete description of weather patterns affecting the fisheries in question as well as southern New England and the Northeast region.

7.2.2 Description of habitat

A complete description of the physical environment in the Gulf of Maine, Georges Bank, and portions of the Continental Shelf south of New England is contained in Section E.6.2.1 the FSEIS for Amendment 5 to the Northeast Multispecies FMP. The following section contains additional information about the Mid-Atlantic region to Cape Hatteras because whiting and red hake generally tend to be distributed further south than other groundfish species.

7.2.2.1 Mid-Atlantic

The coastal zone of the Mid-Atlantic states varies from a glaciated and rugged coastline from Cape Cod south to the New York Bight; further south the coast is bordered by a 160 km wide plain. Along the coastal plain, the beaches of the outer banks and barrier islands are wide, gently sloped and sandy, with gradually deepening offshore waters. The area is characterized by a series of sounds, broad estuaries, large river basins (e.g. Connecticut, Hudson, Delaware and Susquehanna), and barrier islands. Conspicuous estuarine features are Narragansett Bay, Long Island Sound, the Hudson River, Delaware Bay, Chesapeake Bay, and the nearly continuous band of estuaries behind outer banks and barrier islands along southern Long Island, New Jersey, Delaware, Maryland, Virginia and North Carolina. The complex estuary of Currituck, Albemarle, and Pamlico Sounds behind the Outer Banks on Cape Hatteras (covering an area of 6,500 km2 or 2,500 square miles, with 150,000 acres of salt marsh) is an important feature of the region. Chesapeake Bay is the largest estuary in the U.S., draining 64,000 square miles of land
from five states, and includes almost 300,000 acres of salt marsh and 100,000 acres of tidal flats. Coastal marshes border small estuaries in Narragansett Bay and all along the glaciated coast from Cape Cod around Long Island Sound. Nearly continuous marshes occur along the shores of the estuaries behind the outer banks and around Delaware Bay. As a whole, this region contains more than 3,500 square miles of wetlands, one-third of which are in Chesapeake Bay. Atlantic coastal plain estuaries are characteristically shallow and subject to strong tidal circulation, thus creating ideal conditions for biological productivity.

At Cape Hatteras, the shelf extends seaward approximately 33 km, then widens gradually to 113 km off New Jersey and Rhode Island. It is intersected by numerous underwater canyons. Surface circulation north of Cape Hatteras is generally southwesterly during all seasons, although this may be interrupted by coastal in-drafting and some reversal of flow at the northern and southern extremities of the area. Speeds of the drift are on the order of 9 km per day. There may be a shoreward component to this drift during the warm half of the year and an offshore component during the cold half. The Gulf Stream is located about 160 km offshore of Cape Hatteras, but becomes less discrete and veers to the northeast north of the cape. Surface currents, as high as 200 cm per second (4 knots), have been measured in the Gulf Stream off Cape Hatteras.

Hydrographic conditions in the mid-Atlantic region vary seasonally due to river runoff and warming in spring and cooling in winter; the water column becomes increasingly stratified in the summer and homogenous in the winter due to fall-winter cooling of surface waters. In winter, mean minimum and

maximum sea surface temperatures are 0°C and 7°C off Cape Cod and 1°C and 14°C off Cape Charles (at the end of the Delmarva Peninsula); in summer, the mean minimums and maximums are 15°C and 21°C off Cape Cod, and 20°C and 27°C off Cape Charles. The tidal range averages slightly over one meter on Cape Cod, decreasing to a meter at the tip of Long Island and on the Connecticut shore. Westward within Long Island tide ranges gradually increase, reaching two meters at the head of the Sound and in the New York Bight. South of the bight, tidal ranges decrease gradually to slightly over a meter at Cape Hatteras.

The waters of the coastal mid-Atlantic region have a complex and seasonally dependent circulation pattern. Seasonally varying winds and irregularities in the coastline result in the formation of a complex system of local eddies and gyres. Surface currents tend to be strongest during the peak river discharge period in late spring and during periods of highest winds in the winter. In late summer, when winds are light and estuarine discharge is minimal, currents tend to be sluggish, and the water column is generally stratified.

7.2.3 Gear Impacts from the small-mesh multispecies fishery

The small-mesh multispecies fishery is primarily a trawl fishery (Table 39), with most of the exemption areas in the northern stock area (Gulf of Maine Grate Raised Footrope Exemption Area, Small Mesh Areas I and II, and the Raised Footrope Trawl Exemption Area near Cape Cod) requiring the use of a raised footrope trawl. Amendment 16 to the Northeast Multispecies FMP has a detailed description of the impacts of gear effects on EFH.

Table 39 Landings of small-mesh multispecies by gear (2008-2010)

Gear Type	% of Total Small-Mesh Multispecies Landings
Otter Trawl, including Raised Footrope Trawl	97.76%
Sink Gillnets	1.09%
All Other Gear[‡]	1.15%

[‡]Includes: Handgear, Pots and Traps, Shrimp Trawl, Dredges, Longline, and all other reported gear

According to the Council's initial EFH Amendment (NEFMC 1999, Amendment 11 to the Northeast Multispecies FMP), "bottom-tending mobile gears (otter trawls, scallop dredges, beam trawls, and hydraulic clam dredges) are most likely to be associated with adverse impacts to habitat. Jones (1992) suggests that beam trawls, otter trawls, and dredges are all essentially similar in impact, and the severity of the impact can be correlated to the weight of the gear that is in contact with the bottom. The heavier the gear that contacts the bottom, the greater the impact the gear has. This may be an oversimplification, but it illustrates an important point – the lighter the gear, the less impact it is likely to have." Section 9.3.1.2.2.1.1 in Amendment 13 to the Northeast Multispecies FMP has a detailed description of trawls and their many configurations.

A description of the raised footrope trawl, required in all of the inshore Gulf of Maine Exemption Areas (Gulf of Maine Grate Raised Footrope Trawl, Small Mesh Areas I and II and the Raised Footrope Trawl Area near Cape Cod), was included in the Council's on-going second EFH Omnibus Amendment's Swept Area Seabed Impact Model document (NEFMC 2011), as well as in Amendment 13 to the Northeast Multispecies FMP. The raised footrope trawl was "designed capture small-mesh species (silver hake, red hake, and dogfish). Raised-footrope trawls can be rigged with or without a chain sweep. If no sweep is used, drop chains must be hung at defined intervals along the footrope. In trawls with a sweep, chains connect the sweep to the footrope. Both configurations are designed to make the trawl fish about 0.45 - 0.6 m (1.5 - 2 ft) above the bottom (Carr and Milliken 1998). Although the doors of the trawl still ride on

the bottom, underwater video and observations in flume tanks have confirmed that the sweep in the raised footrope trawl has much less contact with the sea floor than does the traditional cookie sweep that it replaces (Carr and Milliken 1998)."

7.3 Human Communities (Economic and Social Trends)

7.3.1 Silver and offshore hake landings and revenue

Silver and offshore hake landings and revenue peaked in 1996 (Table 40). In 2006, the smallest amount of silver hake were landed, 5,000 mt, coinciding with the lowest revenue earned from silver hake landings. Since then, silver hake landings and revenues have been generally increasing. It appears that while current landings are lower than landings in the 1990's, there is an increasing trend in both landings and revenue in recent years (Figure 10). Peak landings in the Northern management area also occurred in 1996, at 3,619 mt, which earned $3 million in revenue. The lowest silver hake landings in the Northern area occurred in 2008 with 618 mt, earning $832,000 in revenue. In recent years, landings in the Northern area have been greater than 1,000 mt, earning revenue $1.2 million - $2.3 million (Table 41). Landings in the Southern area account for two-thirds to nearly all of the total landings (Table 41). Landings range from 4,629 mt – 13,441 mt. Peak landings in the Southern area in 2009 were 13,000 mt, earning $15 million in revenue. This was also the year with peak revenue from silver hake. The lowest landings occurred in 2006 and were 4,629 mt, earning approximately $6 million. The lowest revenue from silver hake was in 2002 at $5million in the Southern stock area (Table 41).

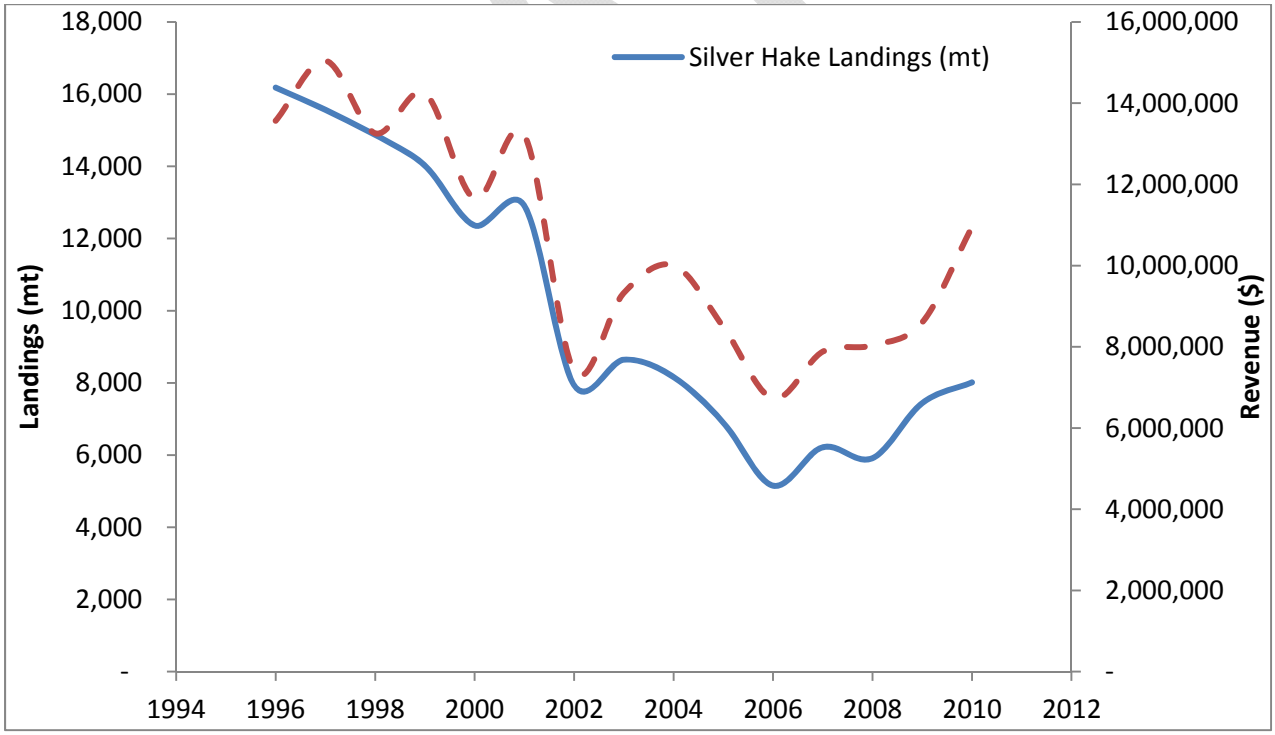
Table 40. Silver hake and offshore hake landings and revenue (1996-2010).

Year	Silver hake landings (mt)	Silver hake revenue ($)	Offshore hake landings (mt)	Offshore hake revenue ($)
1996	16,181	13,567,329	67	60,663
1997	15,565	15,045,264	23	16,005
1998	14,867	13,259,078	5	5,807
1999	14,020	14,243,589	12	19,673
2000	12,362	11,644,431	5	7,035
2001	12,908	13,211,153	2	2,013
2002	7,938	7,410,730	6	4,055
2003	8,643	9,326,001	11	18,150
2004	8,163	10,006,343	27	31,429
2005	6,902	8,493,180	14	15,265
2006	5,153	6,727,695	37	45,001
2007	6,217	7,880,472	12	10,806
2008	5,915	8,035,894	21	24,152
2009	7,441	8,602,262	20	31,371
2010	8,014	10,951,987	10	16,348

Table 41 Silver Hake landings and revenue by stock area.

	Northern Stock		Southern Stock	
Year	Landings (mt)	Revenue($)	Landings (mt)	Revenue($)
1996	3,619	3,034,584	12,560	10,531,566
1997	2,802	2,708,077	12,761	12,335,466
1998	2,045	1,824,252	12,828	11,440,726
1999	3,444	3,498,658	10,577	10,746,305
2000	2,591	2,440,854	9,734	9,169,144
2001	3,391	3,470,530	9,379	9,598,879
2002	2,593	2,420,618	5,343	4,988,009
2003	1,808	1,950,450	6,833	7,373,296
2004	1,012	1,240,949	7,436	9,115,907
2005	853	1,049,283	6,671	8,208,849
2006	879	1,147,976	4,629	6,043,655
2007	1,017	1,288,530	5,345	6,774,279
2008	613	832,397	5,645	7,669,565
2009	1,038	1,199,934	13,441	15,539,587
2010	1,693	2,313,869	6,386	8,726,243

Figure 10 Silver hake landings and revenue (1996-2010). Revenue is plotted on the secondary axis.



7.3.2 Red hake landings and revenue

Landings of red hake peaked in 2001 at 1,600 mt and revenue was also the greatest ($912,000) in this year (Table 42). The lowest red hake landings occurred in 2005; while in 2006, there was the least

amount of revenue earned from red hake ($393,000). Peak landings in the Northern management area were 394 mt in 1996, which earned $252,000 in revenue (Table 43). The lowest red hake landings in the Northern area occurred in 2008 with 9 mt, earning $7,865 in revenue. In recent years, landings in the Northern area have been less than 100 mt, earning revenue $300,000 -$400,000.

Landings of red hake in the Southern area also account for two-thirds to nearly all of the total red hake landings (Table 43). Peak landings in the Southern area were in 2001 and were 1,464 mt, earning approximately $800,000 in revenue. In 2000, there was $808,000 earned revenue from red hake landings. The lowest landings occurred in 2005 and were 356 mt, earning approximately $400,000. The lowest revenue from red hake was in 2006 at $326,000 in the Southern stock area.

Table 42. Red Hake Landings and Revenue (1996-2010)

Year	Landings (mt)	Revenue ($)
1996	1,097	703,343
1997	1,322	790,556
1998	1,327	762,793
1999	1,557	920,320
2000	1,589	907,560
2001	1,672	912,883
2002	908	668,312
2003	808	557,278
2004	674	547,812
2005	427	478,070
2006	453	393,581
2007	512	415,368
2008	587	495,332
2009	613	463,879
2010	603	497,934

Table 43. Red hake landings and revenue by stock area.

	Northern Stock		Southern Stock	
Year	**Landings (mt)**	**Revenue($)**	**Landings (mt)**	**Revenue($)**
1996	394	252,760	700	448,738
1997	322	192,493	999	597,230
1998	173	99,212	1,154	663,553
1999	206	121,645	1,351	798,600
2000	172	98,106	1,415	808,329
2001	204	111,146	1,465	799,548
2002	245	180,070	663	488,059
2003	185	127,810	623	429,362
2004	82	66,906	588	477,880
2005	73	82,122	356	398,446
2006	77	67,183	375	326,416
2007	42	34,243	470	381,118
2008	9	7,685	579	488,910
2009	39	29,404	574	
2010	51	41,932	553	456,129

7.3.3 Small-mesh multispecies landings by state

Table 44 displays silver hake and red hake landings for each state in New England and the Mid-Atlantic (1996-2010) and the percentage of those landings compared to the state's entire landings. For the most part, silver hake comprises a small percentage of each state's landings. CT, RI and NY are among the states with the largest proportion of silver hake landings when compared to the state's total landings. Silver hake landings in CT have consistently been 15-32% of the state's total landings. The silver hake landings in both NY and RI have been 8-26% of the state's total landings.

The proportion of silver hake landings to total landings in ME has consistently been low; however, in recent years, this proportion has been nearly 0%. The landings in total and of silver hake have decreased from 1996-2010; however, the proportion of silver hake landings to total landings has been about equal for 1997-2010. In NH, the proportion of silver hake landings has been about 2%, while the red hake proportion is very minor, nearly 0%. The magnitude of silver hake landings is less in recent years than it had been in the late 1990s; however, the proportion of silver hake landings to total landings is nearly equal throughout the period.

The proportion of silver hake landings to total landings has fluctuated between 1-3%, while the reliance on red hake landings is very minor. Interestingly, while the magnitude of both silver hake and total landings has increased, the proportion of silver hake and red hake landings has not fluctuated much. RI has the second greatest magnitude of silver hake landings among the studied states, but the silver hake landings make up less than ten percent of total state landings. The reliance on silver hake has fluctuated between 3-10%, while red hake constituted less than one percent of total state landings.

In CT, up to one-third of state landings are silver hake. The proportion of silver hake to total landings has fluctuated from 15% (2003) – 36% (1999). While landings in the last ten years have been some of the lowest amount of silver hake landings, this is apparent across all fisheries. The proportion of silver hake to total landings has remained approximately equal over this same time period. Red hake is not relied upon as much in CT—less than five percent of state landings are red hake.

NY has the highest magnitude of silver hake landings of any other state in New England or the Mid-Atlantic. Silver hake comprised 8-26% of total landings; however, there has been an increasing reliance of silver hake from 2005-2010. Red hake comprise less than three percent of total state landings. Silver hake represent a minor proportion of NJ's state landings (1.25% to less than one percent) and red hake comprise an even smaller proportion of the state's landings (less than one percent).

Table 44 Silver and red hake landings by state as percentage of total state landings.

		Landings (mt)			***Proportion of total landings (%)***	
State	**Year**	**Silver hake**	**Red hake**	**Total**	**Silver hake**	**Red hake**
Maine	1996	1,454.5	0.386	115,426	1.26	0.00
	1997	564.3	0.015	120,346	0.08	0.00
	1998	73.6	0.24	93,643	0.06	0.00
	1999	64.4	0.025	113,323		0.00
	2000	9.8	0.03	116,759	0.01	0.00
	2001	15.2	0.77	116,248	0.01	0.00
	2002	19.2	0.07	94,678	0.02	0.00
	2003	1.0	0.01	102,293	0.00	0.00
	2004	6.4	0.00	107,893	0.01	0.00
	2005	1.1	.	99,530	0.00	.
	2006	1.6	.	97,147	0.00	.
	2007	0.2	0.03	86,159	0.00	0.00
	2008	0.5	0.04	92,305	0.00	0.00
	2009	0.3	0.02	89,981	0.00	0.00
	2010	3.7	.	77,882	0.00	.
New Hampshire	1996	111.1	.	4,623	2.40	.
	1997	148.5	0.003	4,549	3.26	0.00
	1998	49.0	.	4,284	1.14	.
	1999	110.6	0.648	4,767	2.32	0.01
	2000	162.5	.	7,648	2.13	.
	2001	135.7	0.30	7,902	1.72	0.00
	2002	79.0	0.07	10,056	0.79	0.00
	2003	83.7	0.04	12,014	0.70	0.00
	2004	57.3	0.17	9,475	0.60	0.00
	2005	45.8	0.01	9,289	0.49	0.00
	2006	41.3	0.01	4,734	0.87	0.00
	2007	95.1	.	3,905	2.44	.
	2008	81.2	.	4,494	1.81	.
	2009	139.3	0.04	5,997	2.32	0.00
	2010	99.5	.	5,103	1.95	.
Massachusetts	1996	1,233.0	392.95	93,547	1.32	0.42
	1997	1,293.0	314.07	92,105	1.40	0.34
	1998	1,191.6	143.42	102,736	1.16	0.14
	1999	1,921.9	184.35	78,676	2.44	0.23
	2000	2,260.0	179.74	75,578	2.99	0.24
	2001	2,489.3	169.42	97,561	2.55	0.17
	2002	2,158.7	211.89	98,833	2.18	0.21
	2003	2,722.8	194.57	120,967	2.25	0.16
	2004	2,139.5	136.28	139,344	1.54	0.10
	2005	1,862.4	73.84	140,060	1.33	0.05
	2006	1,255.6	105.30	148,246	0.85	0.07
	2007	1,438.0	80.91	125,846	1.14	0.06

		Landings (mt)			*Proportion of total landings (%)*	
State	**Year**	**Silver hake**	**Red hake**	**Total**	**Silver hake**	**Red hake**
	2008	1,308.2	39.00	135,897	0.96	0.03
	2009	2,303.5	99.27	150,613	1.53	0.07
	2010	3,041.8	106.09	118,202	2.57	0.09
Rhode Island	1996	4,231.5	337.54	60,867	6.95	0.55
	1997	5,246.2	435.34	61,513	8.53	0.71
	1998	4,670.4	553.85	58,326	8.01	0.95
	1999	4,381.6	652.51	55,038	7.96	1.19
	2000	4,766.3	683.56	52,588	9.06	1.30
	2001	4,185.8	728.47	51,101	8.19	1.43
	2002	2,305.6	290.45	45,425	5.08	0.64
	2003	2,6210	283.15	41,865	6.26	0.68
	2004	2,175.6	216.29	49,871	4.36	0.43
	2005	1,888.2	105.02	42,848	4.41	0.25
	2006	1,542.4	182.54	49,694	3.10	0.37
	2007	2,010.5	179.95	33,435	6.01	0.54
	2008	1,468.3	278.73	31,406	4.68	0.89
	2009	1,652.1	197.05	36,941	4.47	0.53
	2010	1,557.6	226.32	33,404	4.66	0.68
Connecticut	1996	2,559.9	105.29	8,662	29.55	1.22
	1997	1,888.8	174.77	8,062	23.43	2.17
	1998	1,761.6	119.83	7, 409	23.78	1.62
	1999	2,943.8	163.99	8,034	36.64	2.04
	2000	2,813.1	172.86	8,396	33.51	2.06
	2001	2,363.6	155.23	8,158	28.97	1.90
	2002	1,149.0	151.32	7,055	16.29	2.14
	2003	1,113.0	189.53	7,156	15.55	2.65
	2004	1,331.8	190.00	7,975	16.70	2.38
	2005	1,496.7	172.53	6,084	24.60	2.84
	2006	1,065.0	119.66	5,219	20.41	2.29
	2007	709.8	120.75	4,452	15.94	2.71
	2008	930.1	128.91	3,073	30.27	4.20
	2009	919.2	143.16	3,051	30.13	4.69
	2010	759.5	64.84	2,363	32.14	2.74
New York	1996	5,769.9	196.42	26,740	21.58	0.73
	1997	5,434.5	285.07	26,351	20.62	1.08
	1998	6,413.5	393.61	24,381	26.31	1.61
	1999	4,259.9	439.88	21,596	19.73	2.04
	2000	2,048.2	398.41	19,660	10.42	2.03
	2001	3,352.6	461.05	18,698	17.93	2.47
	2002	1,799.1	191.47	16,928	10.63	1.13
	2003	2,031.6	126.31	17,286	11.75	0.73
	2004	2,348.0	112.79	15,263	15.38	0.74
	2005	1,517.1	55.21	16,954	8.95	0.33
	2006	1,159.8	23.47	14,480	8.01	0.16
	2007	1,508.9	76.56	14,384	10.49	0.53
	2008	1,708.1	90.30	13,605	12.55	0.66
	2009	1,782.6	92.07	14,849	12.00	0.62
	2010	2,267.8	132.64	12,058	18.81	1.10
New Jersey	1996	815.6	60.88	81,290	1.00	0.07
	1997	986.3	106.51	77,475	1.27	0.14
	1998	701.1	111.50	87,427	0.80	0.13

		Landings (mt)			*Proportion of total landings (%)*	
State	**Year**	**Silver hake**	**Red hake**	**Total**	**Silver hake**	**Red hake**
	1999	335.7	112.54	75,376	0.45	0.15
	2000	299.0	153.75	77,077	0.39	0.20
	2001	358.7	144.74	75,292	0.48	0.19
	2002	421.1	60.95	72,598	0.58	0.08
	2003	65.0	14.27	76,163	0.09	0.02
	2004	102.6	17.87	84,157	0.12	0.02
	2005	90.7	20.60	69,273	0.13	0.03
	2006	84.3	19.51	68,535	0.12	0.03
	2007	452.3	52.60	69,082	0.65	0.08
	2008	308.9	47.27	72,675	0.43	0.07
	2009	640.4	80.81	85,266	0.75	0.09
	2010	281.5	72.44	62,438	0.45	0.12

Table 45 summarizes revenue from silver and red hake, as well as total revenue per state. The proportion of total revenue that is made of silver hake and red hake is also displayed. In ME there was $117-1.1 million in revenue from silver hake. These revenues comprised <0.0001-0.463% of total state revenues. In 1996, silver hake landings made up approximately 0.5% of total state revenue. Following 1996, there has been a steady decline in revenue from silver hake landings; the same trend is true for red hake landings. Revenue from red hake landings make up less than 0.001% of total state revenue. In NH, during the period 1996-2010, revenue from silver hake was $41,000-139,000, comprising less than 0.24-2.4% of total state fishing revenue. Revenue from red hake landings were $0-300, comprising less than 0.0001% of total state fishing revenues. The greatest proportion of NH's revenue from silver hake was in 2004, at 2.4%. In 2010, the largest revenue from silver hake landings was $139,000, representing approximately 2% of total state fishing revenues. Revenue from red hake landings are very minor, approximately $300 and less than 0.0001% of total state fishing revenues.

Revenue from silver hake landings in MA was $930,000-3,000,000 in 1996-2010; this was less than 3% of total state fishing revenues over the same time period. Revenue from red hake landings was $100,000-284,000, but this was less 0.1% of total MA fishing revenue. The largest revenue from silver hake on record in MA occurred in 2010; while, the greatest revenue from red hake landings occurred in 1996. Revenue from silver hake was $1.4-4.5 million from 1996-2010 in RI; while revenue from red hake landings was $100,000-284,000 during this same time period. Revenue from silver hake was 2-6% of total state fishing revenue; while revenue from red hake was 0.1-1.0% of total RI revenue for 1996-2010. In 1997, landings of silver hake were the most profitable in this time period, $4.5 million, representing about 6% of total state fishing revenues. It is interesting to note that in 2007, lower revenues achieved this same proportion of dependence on silver hake.

One-third of CT's total landings comprised silver hake; the same is true in terms of revenue. Revenue from silver hake landings in CT were $700,000-3 million, approximately 4.2-32% of total state fishing revenue. Revenue from red hake was less than 5% of total state fishing revenue. Revenue from silver hake landings in NY were $1.2– 6.3 million for 1996-2010, representing approximately 4-18% of total state fishing revenue. Revenue from red hake landings were $23,000-336,000, approximately less than one percent of NY's fishing revenue. In NJ uring the period 1996-2010, revenue from silver hake was $84,000-906,000, comprising less than one percent of total state fishing revenue. Revenue from red hake landings were $16,000-116,000 comprising less than 0.12% of total state fishing revenues.

Table 45.Silver and red hake revenue by state as percentage of total state revenue.

		Revenue (000$)			*Proportion of total revenue (%)*	
State	**Year**	**Silver Hake**	**Red Hake**	**Total**	**Silver hake**	**Red hake**
Maine	1996	1,174.93	0.34	253,284.77	0.4639	0.0001
	1997	319.28	0.02	274,754.74	0.1162	0.0000
	1998	47.74	0.05	277,453.16	0.0172	0.0000
	1999	49.76	0.01	323,837.18	0.0154	0.0000
	2000	13.35	0.04	348,053.64	0.0038	0.0000
	2001	12.00	0.41	299,618.65	0.0040	0.0001
	2002	10.37	0.14	307,266.99	0.0034	0.0000
	2003	1.06	0.01	315,268.02	0.0003	0.0000
	2004	6.02	0.00	407,557.58	0.0015	0.0000
	2005	0.46	.	415,636.14	0.0001	.
	2006	1.60	.	97,146.62	0.0017	.
	2007	0.17	0.03	86,158.93	0.0002	0.0000
	2008	0.47	0.04	92,304.93	0.0005	0.0001
	2009	0.30	0.02	89,980.57	0.0003	0.0000
	2010	3.72	.	77,881.67	0.0048	.
New Hampshire	1996	97.70	.	13,586.20	0.7191	.
	1997	112.69	0.01	12,586.58	0.8953	0.0001
	1998	41.20	.	11,186.35	0.3683	.
	1999	107.62	0.10	12,539.96	0.8582	0.0008
	2000	130.34	.	16,197.60	0.8047	.
	2001	121.46	0.12	17,909.77	0.6782	0.0007
	2002	84.91	0.04	16,736.87	0.5073	0.0003
	2003	86.03	0.02	15,315.41	0.5617	0.0001
	2004	58.00	0.30	8,035.83	0.7218	0.0037
	2005	54.17	0.02	22,232.42	0.2436	0.0001
	2006	41.32	0.01	4,733.59	0.8730	0.0002
	2007	95.14	.	3,904.85	2.4364	.
	2008	81.22	.	4,493.95	1.8073	.
	2009	139.26	0.04	5,996.71	2.3223	0.0007
	2010	99.47	.	5,102.81	1.9493	.
Massachusetts	1996	930.43	191.28	231,940.75	0.4012	0.0825
	1997	1,141.81	147.53	224,571.30	0.5084	0.0657
	1998	1,327.28	93.10	205,896.76	0.6446	0.0452
	1999	2,612.27	134.13	260,381.27	1.0033	0.0515
	2000	2,200.84	98.26	291,247.50	0.7557	0.0337
	2001	2,620.59	117.22	280,652.37	0.9338	0.0418
	2002	1,902.25	131.10	297,047.51	0.6404	0.0441
	2003	2,583.16	129.41	293,229.06	0.8809	0.0441
	2004	2,233.55	109.03	326,385.65	0.6843	0.0334
	2005	1,807.35	65.55	426,834.02	0.4234	0.0154
	2006	1,255.62	105.30	148,246.45	0.8470	0.0710
	2007	1,438.00	80.91	125,845.95	1.1427	0.0643
	2008	1,308.16	39.00	135,897.01	0.9626	0.0287
	2009	2,303.46	99.27	150,613.14	1.5294	0.0659
	2010	3,041.78	106.09	118,201.65	2.5734	0.0898
Rhode Island	1996	3,219.82	189.58	70,431.52	4.5716	0.2692
	1997	4,483.86	234.77	78,088.83	5.7420	0.3007
	1998	3,486.90	219.29	71,990.70	4.8435	0.3046

		Revenue (000$)			*Proportion of total revenue (%)*	
State	**Year**	**Silver Hake**	**Red Hake**	**Total**	**Silver hake**	**Red hake**
	1999	3,477.22	284.07	86,041.62	4.0413	0.3302
	2000	3,639.55	268.48	80,965.36	4.4952	0.3316
	2001	3,607.02	263.27	68,657.28	5.2537	0.3835
	2002	1,702.50	163.36	64,717.93	2.6307	0.2524
	2003	2,036.80	152.80	66,088.02	3.0819	0.2312
	2004	2,130.31	111.55	77,385.01	2.7529	0.1442
	2005	1,855.90	100.42	91,410.98	2.0303	0.1099
	2006	1,542.37	182.54	49,693.85	3.1037	0.3673
	2007	2,010.46	179.95	33,434.79	6.0131	0.5382
	2008	1,468.25	278.73	31,405.57	4.6751	0.8875
	2009	1,652.07	197.05	36,941.04	4.4722	0.5334
	2010	1,557.57	226.32	33,404.40	4.6628	0.6775
	1996	1,943.38	76.25	48,417.25	4.0138	0.1575
	1997	1,739.98	96.24	33,081.97	5.2596	0.2909
	1998	1,448.61	67.97	34,359.38	4.2161	0.1978
	1999	3,119.07	81.30	38,090.42	8.1886	0.2135
	2000	2,754.70	101.00	31,245.53	8.8163	0.3233
	2001	2,219.40	92.47	31,194.44	7.1147	0.2964
	2002	1,166.55	130.04	27,779.08	4.1994	0.4681
Connecticut	2003	1,460.25	139.10	29,825.50	4.8960	0.4664
	2004	2,028.11	192.52	33,399.34	6.0723	0.5764
	2005	2,183.02	209.72	37,570.31	5.8105	0.5582
	2006	1,065.02	119.66	5,219.07	20.4064	2.2928
	2007	709.77	120.75	4,452.08	15.9425	2.7122
	2008	930.07	128.91	3,072.57	30.2702	4.1955
	2009	919.21	143.16	3,050.65	30.1317	4.6929
	2010	759.52	64.84	2,363.04	32.1417	2.7438
	1996	5,578.85	189.82	86,670.00	6.4369	0.2190
	1997	6,337.49	232.52	89,614.78	7.0719	0.2595
	1998	6,273.31	299.20	81,828.13	7.6664	0.3657
	1999	4,571.00	338.91	74,787.60	6.1120	0.4532
	2000	2,589.67	322.50	61,121.40	4.2369	0.5276
	2001	4,218.39	336.14	55,072.52	7.6597	0.6104
	2002	2,127.89	188.51	51,264.53	4.1508	0.3677
New York	2003	3,055.45	119.55	51,603.26	5.9210	0.2317
	2004	3,448.59	110.69	46,877.09	7.3567	0.2361
	2005	2,480.61	72.23	56,436.68	4.3954	0.1280
	2006	1,159.80	23.47	14,479.63	8.0098	0.1621
	2007	1,508.92	76.56	14,383.96	10.4903	0.5322
	2008	1,708.09	90.30	13,605.46	12.5545	0.6637
	2009	1,782.58	92.07	14,849.02	12.0047	0.6201
	2010	2,267.75	132.64	12,057.75	18.8074	1.1000
	1996	617.49	54.30	94,677.33	0.6522	0.0574
	1997	906.78	76.44	99,628.31	0.9102	0.0767
	1998	630.30	80.68	97,235.08	0.6482	0.0830
	1999	305.21	80.51	97,856.85	0.3119	0.0823
New Jersey	2000	311.19	116.87	107,162.56	0.2904	0.1091
	2001	400.53	90.51	110,246.35	0.3633	0.0821
	2002	402.48	54.39	112,706.04	0.3571	0.0483
	2003	90.94	16.12	120,670.28	0.0754	0.0134
	2004	100.09	23.28	145,214.84	0.0689	0.0160

		Revenue (000$)			*Proportion of total revenue (%)*	
State	**Year**	**Silver Hake**	**Red Hake**	**Total**	**Silver hake**	**Red hake**
	2005	111.66	30.04	156,428.96	0.0714	0.0192
	2006	84.33	19.51	68,534.91	0.1231	0.0285
	2007	452.30	52.60	69,082.30	0.6547	0.0761
	2008	308.91	47.27	72,674.64	0.4251	0.0650
	2009	640.41	80.81	85,265.86	0.7511	0.0948
	2010	281.49	72.44	62,438.45	0.4508	0.1160

7.3.4 Small-mesh multispecies landings by port

Point Judith, RI leads all other ports in New England and the Mid-Atlantic in silver hake landings for the years 2000-2008. In 2009, Point Judith, RI drops to the second highest port in silver hake landings, and in 2010, drops to number 3 (Table **49**). Stonington, CT has the second highest silver hake landings in 2000 and third in 2001, but drops to number 11 in 2002 (Table 46). Stonington drops to the 10th position in 2009, but slightly rebounds to the seventh positing in 2010 (Table **49**). Hampton/Seabrook, NH was 13th in terms of silver hake landings in 2000 (Table 46), but dropped out of the top 20 in 2003 (**Error! Reference source not found.**). Tiverton, RI was 15th in 2000 and 18th in 2002 (Table 46), but eventually dropped out of the top 20 in 2003 (**Error! Reference source not found.**). Hampton Bays, NY dropped from the fifth position in 2008 (Table **48**) to the ninth position in 2010 (Table **49**).

Other ports began to gain prominence in silver hake landings. Cape May, NJ and Portland, ME entered the top 20 silver hake landing ports in 2006 (Table **48**). New Bedford, MA had the eighth highest silver hake landings in 2000 (Table 46), but eventually rose to the leading port in 2009 (Table **49**). Gloucester, MA moved from 10th in 2008 (Table 47) to the fifth in 2009 (Table **49**). Provincetown, MA moved from the seventh position in 2000 (Table 46) to the fourth position in 2010 (Table **49**).

Table 46. Ranking of silver hake landings and revenue for the top ports based on quantity of silver hake landed, 2000-2002.

	2000			2001				2002			
Port	**Rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**
Point Judith, RI	1	4,298.1	3,300.1	1	-	3,610.3	3,186.1	1	-	2,154.7	1,607.3
Stonington, CT	2	1,510.8	1,552.9	3	↓	1,209.7	1,113.5	11	↓	135.4	128.6
New London, CT	3	1,302.5	1,202.0	4	↓	1,153.9	1,105.9	4	-	1,013.6	038.0
Gloucester, MA	4	1,082.1	1,212.7	8	↓	619.3	726.4	6	↑	489.0	572.4
Montauk, NY	5	1,057.6	1,384.9	2	↑	2,342.6	3,031.0	2	-	1,164.4	1,473.4
Hampton Bays, NY	6	695.6	862.1	6	-	908.1	1,048.9	7	↓	455.3	477.0
Provincetown, MA	7	633.3	518.1	7	-	711.5	899.6	5	↑	563.6	449.1
New Bedford, MA	8	452.4	381.0	5	↑	1,080.1	896.3	3	↑	1,083.6	845.5
Newport, RI	9	381.2	290.2	9	-	576.7	421.9	9	-	155.9	97.7
Point Pleasant, NJ	10	223.3	229.0	10	-	296.6	345.1	8	↑	288.8	283.2
Greenport, NY	11	166.5	166.4	16	↓	14.0	15.6	13	↑	11.7	7.7
Freeport, NY	12	128.2	176.0	12	-	79.8	114.3	10	↑	143.7	145.8
Hampton Seabrook, NH	13	88.9	78.6	11	↑	109.2	105.4	15	↓	4.0	4.4
Chatham, MA	14	76.7	76.4	13	↑	72.3	93.1	14	↓	10.3	18.9
Tiverton, RI	15	74.6	48.4	.	↓			18	↑	0.1	0.0
Belford, NJ	16	65.4	74.2	14	↑	19.9	27.7	12	↑	124.8	116.7
Portsmouth, NH	17	58.0	40.1	15	↑	17.7	12.0	16	↓	2.7	3.4
Rye, NH	18	15.4	11.6	17	↑	8.7	4.0	17	-	2.4	3.0
Cape May, NJ					-				-		
Portland, ME					-				-		

Table 47. Silver hake landings and revenue for the top silver hake ports based on quantity landed, 2003-2005.

	2003				2004				2005			
Port	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**
Point Judith, RI	1	-	2,372.5	1,857.3	1	-	2,030.6	2,021.7	1	-	1,814.2	1,786.3
Stonington, CT	8	↑	99.0	106.6	8	-	85.3	111.9	7	↑	59.5	85.7
New London, CT	4	-	1,014.0	1,353.6	4	-	1,246.4	1,916.2	2	↑	1,437.2	2,097.3
Gloucester, MA	7	↓	231.7	339.9	6	↑	224.1	314.0	5	↑	451.0	503.8
Montauk, NY	3	↑	1,423.4	2,178.8	3	-	1,537.9	2,303.9	4	↓	1,216.4	2,035.6
Hampton Bays, NY	5	↑	495.3	752.2	5	-	465.0	611.1	6	↓	199.7	284.6
Provincetown, MA	10	↓	71.0	75.8	11	↓	25.7	27.2	15	↓	0.0	0.0
New Bedford, MA	2	↑	2,329.1	2,063.4	2	-	1,868.9	1,876.3	3	↓	1,413.4	1,305.2
Newport, RI	6	↑	248.8	179.7	7	↓	143.4	105.6	9	↓	43.9	42.5
Point Pleasant, NJ	12	↓	31.7	41.4	9	↑	56.7	51.6	10	↓	39.0	51.5
Greenport, NY	14	↓	24.7	24.7	14	-	7.0	13.4	11	↑	7.8	22.7
Freeport, NY	9	↑	82.0	89.9	13	↓	13.1	12.0		↓	.	.
Hampton Seabrook, NH		↓				-				-		
Chatham, MA	11	↑	49.4	62.8	12	↓	16.6	9.8	13	↓	0.4	0.4
Tiverton, RI		↓				-				-		
Belford, NJ	13	↓	31.1	47.8	10	↑	44.7	61.5	8	↑	50.0	58.1
Portsmouth, NH	15	↑	2.5	4.2	15	-	1.9	3.6	12	↑	1.3	1.4
Rye, NH	16	↑	0.4	0.5	16	-	0.5	0.6	14	↑	0.1	0.1
Cape May, NJ		-				-				-		
Portland, ME						-				-		

Table 48. Silver hake landings and revenue for the top silver hake ports based on quantity landed, 2006-2008.

	2006				2007				2008			
Port	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**
Point Judith, RI	1	-	1,488.2	1,653.5	1	-	1,936.7	2,076.3	1	-	1,417.6	1,790.5
Stonington, CT	7	-	107.8	156.6	9	↓	69.5	108.2	9	-	110.3	169.0
New London, CT	3	↓	957.2	1,358.1	4	↓	640.3	1,007.2	4	-	338.0	429.6
Gloucester, MA	6	↓	122.0	217.7	5	↑	312.4	472.1	10	↓	100.7	129.6
Montauk, NY	4	-	742.6	1,263.2	3	↑	906.3	1,435.7	2	↑	1,376.0	2,135.8
Hampton Bays, NY	5	↑	215.2	286.7	6	↓	267.7	331.6	5	↑	180.2	218.9
Provincetown, MA		-			11	↑	19.6	28.8	8	↑	134.0	206.0
New Bedford, MA	2	↑	1,127.8	1,252.2	2	-	1,069.4	1,183.9	3	↓	1,041.6	1,253.2
Newport, RI	8	↑	51.5	42.7	10	↓	48.6	45.3	11	↓	28.5	32.6
Point Pleasant, NJ	9	↑	45.5	59.5	8	↑	223.9	213.5	6	↑	161.8	173.0
Greenport, NY	12	↓	3.5	5.0	13	↓	4.9	8.2	12	↑	10.4	15.4
Freeport, NY	15	↑	0.1	0.3	18	↓	0.0	0.1	17	↑	0.1	0.1
Hampton/Seabrook, NH		-				-				-		
Chatham, MA	16	↓	0.1	0.1	15	↑	0.2	0.3	14	↑	1.6	2.4
Tiverton, RI		-				-				-		
Belford, NJ	10	↓	34.2	56.2	7	↑	226.5	279.1	7	-	137.2	185.5
Portsmouth, NH	13	↓	3.3	4.5	12	↑	7.0	8.1	18	↓	0.0	0.1
Rye, NH	17	↓	0.1	0.2	16	↑	0.2	0.3	16	-	0.4	0.6
Cape May, NJ	11	↑	4.7	2.8	14	↓	1.6	1.7	13	↑	9.8	5.2
Portland, ME	14	↑	1.6	2.1	17	↓	0.2	0.1	15	↑	0.5	0.7

Table 49. Silver landings and revenue for the top silver hake ports based on quantity landed, 2009-2010.

	2009				2010			
Port	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**	**Rank**	**Change in rank**	**Landings (mt)**	**Revenue (000$)**
Point Judith, RI	2	↓	1,633.9	1,529.4	3	↓	1,529.7	1,921.6
Stonington, CT	10	↓	148.1	237.2	7	↑	183.2	244.7
New London, CT	6	↓	281.2	324.7	6	-	246.0	377.6
Gloucester, MA	5	↑	308.9	352.5	5	-	246.9	340.9
Montauk, NY	3	↓	1,488.1	2,140.6	2	↑	1,620.2	2,513.8
Hampton Bays, NY	9	↓	192.0	245.2	9	-	179.1	216.3
Provincetown, MA	8	-	217.3	316.1	4	↑	253.1	494.9
New Bedford, MA	1	↑	1,745.6	1,933.3	1	-	2,420.0	3,019.3
Newport, RI	13	↓	18.0	20.2	11	↓	7.2	6.3
Point Pleasant, NJ	4	↑	358.0	283.8	8	↓	181.4	179.5
Greenport, NY	17	↓	0.1	0.2	15	↑	1.4	1.6
Freeport, NY	18	↓	0.0	0.0	14	↑	1.7	3.0
Hampton/Seabrook, NH		-				-		
Chatham, MA	14	-	0.6	0.6	16	↓	1.2	1.9
Tiverton, RI		-				-		
Belford, NJ	7	-	261.8	304.2	10	↓	93.8	105.1
Portsmouth, NH	15	↑	0.2	0.3	18	↑	0.2	0.2
Rye, NH	11	↑	27.6	19.3	13	↓	4.5	4.1
Cape May, NJ	12	↑	20.6	12.0	12	-	6.4	3.6
Portland, ME	16	↓	0.2	0.2	17	↓	0.6	1.0

7.3.5 Small-mesh multispecies permits by port

From 2000-2010, there was a 78% decrease in the number of permits that recorded landings of silver hake, offshore hake, or red hake in the state of Maine (Table 50 and Table 51). Portland, ME saw the majority of this decrease, with an 81% decline in the number of permits recording landings of the small-mesh multispecies over that decade. Other ports in Maine had relatively few permits landing small-mesh multispecies; in fact, most of these ports had less than three vessel permits reporting landings of the hake species. There was a 50% decrease in the number of permits reporting landings of silver hake, offshore hake, or red hake in New Hampshire for 2000-2010. The ports of Hampton, Seabrook, Rye, and Portsmouth, NH saw a decrease of 50-72% of permits landing hakes (Table 50). The number of unique permits reporting landings of silver hake, red hake or offshore hake decreased by 52% in the Commonwealth of Massachusetts of that decade. The principal fishing ports of Provincetown, Newburyport, Chatham, and Gloucester all saw declines of more than 50% of permits landing these hake species (Table 50).

There was a 42% decline in the number of permits reporting landings of small-mesh multispecies in the state of Rhode Island for 2000-2010. The number of permits landing in Point Judith, RI declined by about a quarter for 2000-2010; while there was an 81% decline in the number of permits reporting landings of these species in Newport, RI over that time period. There was an 18% decline in the number permits reporting landings of small-mesh multispecies in the state of Connecticut for 2000-2010 (Table 50). There was a 12.5% decline in the port of Stonington, CT.

There were declines in permitted vessels reporting hake landings in the mid-Atlantic. There was a decline of 24% of the number of permits reporting landings of small-mesh multispecies in the state of New York for 2000-2010. The ports of Montauk and Shinnecock experienced declines of 11% and 47%, respectively. There was a 150% increase in the number of permits reporting small-mesh multispecies landings in ports that could not be named due to confidentiality issues, indicating an increase in landings in incidental ports (Table 50). There was a 21% decline in the number of permits reporting landings of silver hake, offshore hake or red hake in the state of New Jersey for 2000-2010. There were declines in permits landing small-mesh multispecies in Belford (55%), Belmar (50%), Brielle (20%), Cape May (22%) and Highlands (60%). However, there were increases in the number of permitted vessels reporting silver hake, offshore hake or red hake landings in Barnegat (18%) and Point Pleasant (19%). See Table 50.

Table 51 displays the number of unique permits that landed silver hake, offshore hake, or red hake in the listed ports for the years 2000-2010 in ports that are slightly farther south of the stock areas. Overall, during this time period the number of unique permits landing small-mesh multispecies in Virginia increased by 21%; the same trend is true for the port of Chincoteague. However, there was a 25% decrease in the Hampton port (Table 51). Although, there was fluctuation over this time period, the number of unique permits landing silver hake, offshore hake, or red hake remained the same in Ocean City, MD and North Carolina (Table 51).

Table 50 Number of unique permits landing silver hake, offshore hake or red hake in each port.

Port	State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Boothbay Harbor	ME	3	3	3	*	*	*	*	*	*	*	*
Cape Porpoise	ME	3	*	*	*	*		*	*	3	*	*
Cundys Harbor	ME	3	*	4	*		*	*	*	*	*	
Five Islands	ME	3	3	*	*	*						
Kittery	ME	3	*	*							*	
New Harbor	ME		3	*	*	*						*
Ogunquit	ME	3	3	*	*	*	*	*	*	3	*	*
Port Clyde	ME	3	4	5	*	3	*			*		*
Portland	ME	57	49	37	23	21	21	12	7	8	10	11
Saco	ME	6	*	*	*		*	*	3	*	*	*
South Bristol	ME	4	3	*								
West Point	ME	*	4	*	*	*	*	*			*	*
York	ME	4	3	4	*	3	*		*		*	
*No. Confidential Permits	ME	19	21	26	26	17	14	14	13	15	19	14
TOTAL	*ME*	*111*	*96*	*79*	*49*	*44*	*35*	*26*	*23*	*29*	*29*	*25*
Hampton	NH	6	11	5	8	5	5	4	3	3	3	3
Portsmouth	NH	25	31	23	15	15	8	8	12	6	9	7
Rye	NH	10	10	8	6	7	5	5	7	8	7	6
Seabrook	NH	17	15	13	14	13	17	12	10	12	16	11
*No. Confidential Permits	NH		*	*	*				*	*	*	*
TOTAL	*NH*	*58*	*68*	*50*	*44*	*40*	*35*	*29*	*33*	*30*	*36*	*29*
Barnstable	MA		*	3	*	4	*	*			3	3
Beverly	MA	3	3	*	3		*	*	*	*	*	
Boston	MA	7	6	7	6	4	6	7	7	9	10	5
Chatham	MA	22	20	17	25	16	10	7	9	15	10	9
Gloucester	MA	101	102	98	83	69	52	34	46	56	60	44
Harwichport	MA	4	*			*	3	*	*	*		
Marblehead	MA	4	*	*	*	*				*	*	*
Marshfield	MA	*	*	*	4	*	3	*			*	*
New Bedford	MA	42	50	36	39	38	34	30	29	31	34	27
Newburyport	MA	10	10	9	11	9	4	*	*	3	4	5

Port	State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Plymouth	MA	7	7	5	7	5	4	*	5	3	3	*
Provincetown	MA	21	21	24	15	15	5	4	5	9	8	8
Rockport	MA	7	6	6	5	6	3	*	4	3	4	3
Salisbury	MA	5	3	4	*	*	*	*		*	*	*
Scituate	MA	8	7	11	8	4	3	6	4	8	9	9
*No. Confidential Permits	MA	15	12	11	14	8	6	15	8	7	11	10
TOTAL	*MA*	*256*	*247*	*231*	*220*	*178*	*133*	*103*	*117*	*144*	*156*	*123*
Little Compton	RI	4	*	*	*	4		*	3	*	*	
New Shoreham	RI	4	4	5	5	*		*	3	5		*
Newport	RI	26	30	19	17	12	11	12	10	7	8	5
North Kingstown	RI	3	*	*					*	*	*	*
Point Judith	RI	95	93	99	79	73	73	81	77	83	81	70
*No. Confidential Permits	RI	3	5	5	3	*	*	7	*	3	3	3
TOTAL	*RI*	*135*	*132*	*128*	*104*	*91*	*85*	*100*	*95*	*98*	*92*	*78*
New London	CT	4	5	6	3	4	5	5	4	*	*	3
Stonington	CT	16	18	13	9	10	11	13	10	14	13	14
*No. Confidential Permits	CT	*	3	*	4	*	*	*	*	3	3	*
TOTAL	*CT*	*22*	*26*	*21*	*16*	*15*	*17*	*19*	*15*	*17*	*16*	*18*
Babylon (Captree)	NY						*	*	*	4	3	5
Brooklyn	NY	5	7	7	4	4	*	3	4	7	9	6
East Hampton	NY	*		*	3		4	*	3	*	*	
Freeport	NY	5	8	7	4	3	6	5	3	3	8	7
Greenport	NY	9	4	*	6	4	4	*	*	*	*	*
Hampton Bay	NY	6	6	6	6	7	5	6	6	7	3	5
Island Park	NY	3		*	*	*	*	4	4	5	4	4
Islip	NY	*	*	*	*	*	*	*	*	3	3	*
Mattituck	NY	4	6	3	*	4	*	6	*			
Montauk	NY	53	43	48	39	55	31	37	40	44	42	47
New York City	NY	3	3	3	*		*					*
Oceanside	NY	*		*				*		*	3	*
Other Nassau	NY	6	4	3		4					*	*
Other Suffolk	NY	5	*			10				*		
Pt. Lookout	NY	8	7	7	5	5	5	6	7	9	10	9
Shinnecock	NY	49	49	44	27	26	20	29	28	25	28	26

Port	State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
*No. Confidential Permits	NY	6	4	13	14	4	13	15	7	6	10	15
TOTAL	*NY*	*162*	*141*	*141*	*108*	*126*	*88*	*111*	*102*	*113*	*123*	*124*
Atlantic City	NJ	4	4	*	*	*	*	*	5	*	*	
Barnegat	NJ	4	8	3						4	8	11
Belford	NJ	20	20	18	12	12	13	16	14	12	13	9
Belmar	NJ	10	10	5	5	4	*	5	4	4	4	5
Briele	NJ	5	7	9	7	4	3	4	5	4	4	4
Cape May	NJ	23	36	19	17	19	18	17	15	30	25	18
Highlands	NJ	10	8	6	*	4	*	*	*	3	5	4
Long Beach	NJ	16	12	3	7	9	6	8	10	15	3	*
Ocean City	NJ	*	*		*	*	*	*	3	*	*	*
Pt. Pleasant	NJ	37	44	27	30	30	31	36	29	47	40	44
Sea Isle City	NJ	*	4	3	*		*	*	*	4	4	5
Shark River	NJ	5	3	3	*	4	*	3	*	*	4	*
Wildwood	NJ	5	*	*	*	*	*	3	*	6	*	3
*No. Confidential Permits	NJ	11	11	10	18	13	14	7	12	15	15	16
TOTAL	*NJ*	*150*	*167*	*106*	*96*	*99*	*85*	*99*	*97*	*144*	*125*	*119*

*Ports having less than three permitted vessels are not listed for confidentiality reasons.

Table 51. Number of unique permits landing silver hake, offshore hake or red hake in 'non-traditional' ports.

Port	State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CHINCOTEAGUE	VA	3	4	4	*	4	*	*	*	5	3	6
HAMPTON	VA	4	5	*		*	*	3	*	*	3	3
NEWPORT NEWS	VA	*	*						*	*	3	
VIRGINIA BEACH	VA	*	*	9	3	5	*	3	4	4	6	6
*No. Confidential Permits	VA	7	7	*	4	6	6	3	7	6	2	2
TOTAL	*VA*	*14*	*16*	*15*	*7*	*15*	*6*	*9*	*11*	*15*	*17*	*17*
ENGELHARD	NC	3				*		*		9	*	*
HATTERAS	NC	3	5	*	*	*	*			*		*
WANCHESE	NC	3	*	3	*	*	*	5	4	9	5	7
*No. Confidential Permits	NC	4	6	4	7	8	*	3	*	*	3	6
TOTAL	*NC*	*13*	*11*	*7*	*7*	*8*	*	*8*	*5*	*19*	*8*	*13*
OCEAN CITY	*MD*	*13*	*11*	*10*	*10*	*11*	*7*	*11*	*14*	*14*	*10*	*13*
TOTAL	*FL, GA, SC, DE*	3	*	*	*	5	7	10	5	13	11	12

*Ports having less than three permitted vessels are not listed for confidentiality reasons.

8.0 ENVIRONMENTAL CONSEQUENCES (EA)

8.1 Biological Impacts

8.1.1 Impacts on target species

8.1.1.1 Northern Stock Area TAL and TAL Monitoring Alternatives

The alternatives for the northern stock area are the implementation of a stock-wide TAL or the implementation of a stock-wide TAL, with landings targets for the small-mesh exemption area programs. If the exemption area program landings targets are implemented, a roll-over provision from the Cultivator Shoal Exemption Area Program landing target to the Inshore Gulf of Maine Exemption Area Program landing target would be included. The impacts of the TAL alternatives and the measures necessary to effectively implement those alternatives are discussed together below.

The northern stock area wide TAL is the status quo alternative, as well as the preferred alternative. The impacts of the continuation of a stock-wide TAL in the northern area are likely neutral. The Secretarial Amendment determined that the impacts of moving from a fishery with no catch limits to a fishery with catch limits would be positive for the target species. Maintaining catch limits that were based on the best available science would be neutral on the target species.

The impacts on the target from implementing the exemption area program landing targets are also likely neutral. The overall landing limit would be the same as the stock-area TAL described above, but would simply be sub-divided based on the historical landing proportions of the Cultivator Shoal Exemption Area Program and the inshore Gulf of Maine exemption area programs. Likewise, the impact of the roll-over provision that would make available any underage of the Cultivator Shoal landing target to the inshore exemption area programs would also be neutral for the target stock. The provision would not allow for an increase in the total allowable landings limit, but just rearrange the sub-divided allocations. In-Season Accountability Measure Alternatives – TAL Triggers and Incidental Possession Limits

In-season AMs grant the Northeast Regional Administrator the authority to implement a management measure, such as reducing the trip limit or closing the fishery, when landings are projected to reach a pre-determined level.

8.1.1.2 Southern Stock Area TAL and TAL Monitoring Alternatives

In the Southern stock area, a stock-wide TAL would be monitored either on an annual basis, quarterly, or annually until landings exceed two-thirds of the TAL, in which case quarterly monitoring would be triggered. If quarterly TALs are implemented, a “roll-up” procedure would be used for monitoring. The impacts of the TAL alternatives and the measures necessary to effectively implement those alternatives are discussed together below.

The southern stock area-wide annual TAL is the status quo alternative. The impacts of the continuation of a stock-wide TAL in the southern area are likely neutral. The Secretarial Amendment determined that the impacts of moving from a fishery with no catch limits to a fishery with catch limits would be positive for the target species. Maintaining catch limits that were based on the best available science would be neutral on the target species.

The implementation of quarterly stock-wide TALs would likely have a neutral impact on the target stocks as compared to the status quo alternative. The overall catch limit would not change and was calculated using the best scientific information available. This is also true if the quarterly TALs are implemented after the two-thirds trigger. This alternative is the preferred alternative by the Council. The roll-up provision, which would use a cumulative quarterly TAL to monitor the fishery, would also have a neutral impact on the target stocks. This provision would not change the overall TAL, but would help to ensure that the landings do not exceed the limit.

8.1.1.3 Incidental Possession Limit Trigger (Sections 5.4 and 5.6)

This alternative would reduce possession to an incidental limit when a trigger level is projected to be reached. Under this alternative, the incidental possession limit would remain in effect, even if the TAL is projected to be exceeded. This is intended to work in conjunction with the post-season accountability measure which would be invoked if the overage of the TAL causes the catch for that year to exceed the ACL. This alternative would have neutral impacts because it would allow trips to continue, without causing large amounts of additional small-mesh multispecies discards.

8.1.1.4 In season accountability measures

The purpose of the proposed in-season accountability measures is to curtail trips targeting red, silver, and offshore hake when landings approach the TAL or landings target. Since there is no limited access or day-at-sea limits in the small mesh multispecies fishery, the primary way of doing this is to reduce the possession limits to a level that discourages targeting without increasing discards to unacceptable levels.

Vessels that normally target red or silver hake would be affected economically, altering fishing behavior. Either the vessels would take fewer trips, target other species, or fish in ways that would catch fewer of the species under an incidental possession limit. Of course, vessels that did not alter fishing behavior would catch the same amount of fish, discarding the excess. Therefore the delicate balance is to set an incidental possession limit that would be effective without causing unacceptably high discarding.

Based on a preliminary analysis of the data (see Document 3 in the Appendix), the Council proposes three potential possession limit levels for red and silver hake. In the small mesh area programs, the intent is to prevent excessive targeting of a species approaching a landings target, so that the stock area TALs don't become a constraint on fishing where catches of that species are already incidental and likely to cause excessive discarding. The intent is not to prevent landings in the small mesh area programs from exceeding the landings target. Mainly the incidental limits are intended to encourage vessels that are fishing in the exemption programs to avoid either red or silver hake.

For the stock areas, on the other hand, the intent of the incidental possession limits is to reduce landings, discourage trips targeting red or silver hake, and reduce the risk that catches could exceed the ACL (triggering post-season accountability measures for overages).

The following analyses, using trip data from the 2006-2010 fishing years when landings exceeded the proposed TALs or landings targets, evaluate the potential effectiveness of the in-season accountability measure possession limits to constrain landings, discourage fishing, and limit catch. Only some years exceeded the TAL or landings targets and were used for the analysis. Landings of silver and offshore hakes came nowhere near the TALs in the past five years, so could not be used for the analysis and as such are unlikely to approach the TALs or landings limits in the near future. Trips that target both species together are less likely to change fishing behavior. Industry advisors that fish in the Cultivator Shoals Area Program say that during much of the season, they can target silver hake while catching relatively

few red hake. Red hake landings are much more likely to reach the TALs or landings targets than are landings of silver hake.

8.1.1.4.1 Silver hake

Based on a preliminary PDT analysis of the effectiveness of various silver hake possession limits to reduce landings and catch (see Document 3 in the Appendix), the Council proposes three potential incidental possession limits as accountability measures for the northern and southern stocks of silver hake. Since the southern stock area TAL applies to both silver and offshore hakes, the in-season accountability measure would also apply to both species in the southern stock area. Very few offshore hake are caught in the northern stock area and the possession limit would only apply to silver hake.

The proposed incidental limits are 500, 1000, and 2000 lbs. for both stock areas, to be triggered when silver hake landings reach 90% of the TALs or landings targets. The alternatives are described in Sections 5.4.2 and 5.6.2. Since silver hake are unlikely to become a constraint any time soon, the Council does not propose any in-season accountability measures for the small mesh area programs and landings would be curtailed throughout the northern stock area when they reach 90% of the TAL.

The analysis below for the northern and southern stock areas includes landings derived from dealer reports and transfers at sea on VTRs. Since recent landings are a small fraction of the proposed TALs, the expected effect on the bait fishery will be negligible, whether they occur in the small mesh area exemption programs or elsewhere.

8.1.1.4.1.1 Northern stock area (Section 5.4.3.1)

The proposed silver hake TAL for the northern stock area is 8,973 mt. Since 1994 when the regulated mesh areas were implemented by the Multispecies FMP to limit small mesh fishing, peak landings were 3,781 mt in 1994, well below the TAL (see table below). It is unlikely that the silver hake landings will approach the proposed TAL and therefore the incidental possession limits will not be likely to have any effect.

However, a high possession limit such as 2000 lbs. will be less effective at reducing landings and discouraging vessels from targeting silver hake. On the other hand, a high incidental possession limit would create fewer discards on trips that target other species. Conversely a low possession limit, such as 500 lbs., will be more effective at discouraging trips that target silver hake and reducing landings. Since silver hake are often the primary target (and more valuable component) of trips in the small mesh area programs, it is unlikely that these trips would continue fishing, making unacceptable increases in discarding (while targeting red hake) unlikely.

Based on this analysis, the proposed incidental possession limit accountability measures are unlikely to have any direct effect on the target species, on non-target species, on protected species, or on habitat.

Table 52. Landings of silver and offshore hake reported by dealers. Source: NMFS SAFIS data tables**.**

	STOCK		
	Northern Stock	Southern Stock	
FISHING_YEAR	Silver hake, mt. live	Silver hake, mt. live	Offshore hake, mt. live
1994	3,781	12,115	134.9
1995	2,233	13,045	46.0
1996	3,501	12,706	68.2
1997	2,710	12,601	22.8
1998	2,047	12,965	3.1
1999	3,632	9,606	7.7
2000	2,577	9,951	3.6
2001	3,323	7,765	0.4
2002	2,596	4,629	8.5
2003	1,857	7,964	3.6
2004	985	6,850	26.8
2005	803	6,198	12.4
2006	852	4,544	35.0
2007	1,142	5,858	17.0
2008	518	5,987	20.2
2009	1,115	7,327	15.7
2010	1,633	4,039	3.5

The silver hake landings target for the Cultivator Shoals Area is 4,568 mt and for the other Small Mesh Area Programs is 3,105 mt. Landings of red and silver hake were restricted by the Multispecies FMP since 1994 when the regulated mesh areas were implemented. Since then, six small mesh area programs were identified where small mesh fishing for red and silver hake could take place. For ACL management purposes, the Council is grouping the five inshore areas together and separating the Cultivator Shoals Area AM. Estimated silver hake landings are shown in the table below. Some of the estimated landings for the inshore small mesh areas occurred before the programs were created but represent traditional fishing areas. Since 1994, peak silver hake landings were 1,972 mt in 1999 for the Cultivator Shoals Area and 2,078 mt in 1996 for the inshore small mesh areas. All landings were well below the proposed landings targets. Negligible amounts of silver hake were reported by fishermen as transfers at sea for bait.

Table 53. Landings of silver hake reported by dealers for small mesh area programs. Cultivator Shoals Area and small mesh area programs are estimated based on three digit statistical area and landing date. Source: NMFS SAFIS data tables**.**

Silver hake, mt. live	MGMT_AREA2	
FISHING_YEAR	Cultivator Shoals	Small mesh areas
1994	1,238	1,914
1995	679	1,363
1996	1,140	2,078
1997	1,026	1,153
1998	1,169	675
1999	1,972	1,290
2000	816	1,438
2001	1,817	1,183
2002	1,360	1,078
2003	1,245	534
2004	589	278
2005	553	147
2006	688	137
2007	666	411
2008	91	384
2009	460	599
2010	962	541

8.1.1.4.1.2 Southern stock area (Section 5.6.2)

The proposed silver and offshore hake TAL for the southern stock area is 27,254 mt. Since 1994 when the regulated mesh areas were implemented by the Northeast Multispecies FMP and restricted small mesh fishing[10], peak landings were 13,091 mt in 1995, well below the proposed TAL (Table 52). It is unlikely that the silver hake landings will approach the proposed TAL and therefore the incidental possession limits will not be likely to have any effect.

However, a high incidenetal possession limit such as 2000 lbs. will be less effective at reducing landings and discouraging vessels from targeting silver hake. On the other hand, a high incidental possession limit would create fewer discards on trips that target other species. Conversely a low possession limit, such as 500 lbs., will be more effective at discouraging trips that target silver hake and reducing landings. Since silver hake are often the primary target (and more valuable component) of trips in the small mesh area programs, it is unlikely that these trips would continue fishing, making unacceptable increases in discarding (while targeting red hake) unlikely. More trips in the southern stock area target silver and/or offshore hake while catching few red hake.

Based on this analysis, the proposed incidental possession limit accountability measures are unlikely to have any direct effect on the target species, on non-target species, on protected species, or on habitat.

[10] Large mesh restrictions had less effect in the southern stock area because automatic exemptions applied to much of the Mid-Atlantic and Southern New England regions.

8.1.1.4.2 Red hake

Based on a preliminary PDT analysis of the effectiveness of various red hake possession limits to reduce landings and catch (see Document 3 in the Appendix), the Council proposes three potential incidental possession limits as accountability measures for the northern and southern stocks of red hake.

The proposed incidental limits are 200, 300, and 400 lbs. for both stock areas and all small mesh area programs, to be triggered when silver hake landings reach 90% of the TALs or landings targets. The alternatives are described in Sections 5.4.1 and 5.6.1.

Unlike silver hake, the Council proposes that these limits will also apply to the Cultivator Shoals Area and the small mesh area programs when landings from those areas reach 90% of their respective landings targets (see Section 5.4.3.1). This is intended to act as a break on landings and catch from the small mesh areas so that it reduces the risk that these landings may trigger the accountability measures for the entire northern stock area, reducing potential discards from large mesh and other fisheries.

8.1.1.4.2.1 Small mesh area programs

The proposed red hake landings target for the Cultivator Shoals Area is 16.3 mt and 51.2 mt for the inshore small mesh areas (Section 5.3.3). Since 1994, red hake landings from the Cultivator Shoals Area were often well above the 16.3 mt landings target (see table below). In 2010, red hake landings were about 50% above the landings target. Red hake landings from the inshore small mesh areas have declined, but were above the 51.2 mt target as recently as 2007 and 2009. Combined with bait landings (transfers at sea reported on VTRs), landings for 2006 also exceeded the inshore small mesh area landings target of 51.2 mt. In these cases, there is a high probability that future red hake landings will trigger accountability measures for the Cultivator Shoals Area and the small mesh area programs.

Cultivator Shoals Area accountability measures

Only negligible amounts of transfers at sea for bait were reported for trips fishing in the Cultivator Shoals Area. And although silver hake transfers at sea have been increasing (Figure 11), most of these landings are of red hake and nearly all come from Small Mesh Area I and the Gulf of Maine Raised Footrope Area (Map 1).

The majority of red hake landings from the Cultivator Shoals Area were accepted and reported by dealers. During early to mid-August, red hake landings exceeded the Cultivator Shoals Area 16.3 mt landings target during 2005, 2006, and 2010 (Figure 12). Red hake landings also exceeded the target in 2007, at the end of the Cultivator Shoals Area exemption season.

Table 54. Landings of red hake reported by dealers for small mesh area programs. Cultivator Shoals Area and small mesh area programs are estimated based on three digit statistical area and landing date. Source: NMFS SAFIS data tables. Data since 2006 include transfers at sea for bait, reported by fishermen on VTRs. These bait data have been revised since the benchmark assessment (NEFSC 2011a).

STOCK	(Multiple Items)	
Sum of Red hake, mt live	Small mesh program	
FISHING_YEAR	Cultivator Shoals	Small mesh areas
1994	41.7	433.0
1995	13.4	117.2
1996	20.7	317.5
1997	27.5	242.9
1998	48.2	108.0
1999	57.3	133.0
2000	29.1	117.6
2001	63.6	115.6
2002	64.2	161.9
2003	88.1	98.7
2004	33.9	34.4
2005	30.3	30.9
2006	43.3	49.3
2007	17.7	49.6
2008	2.2	49.3
2009	16.6	67.7
2010	24.6	33.4

Figure 11. Reported transfers at sea for bait by management area, landings of red and silver hake, mt live wt. Source: NMFS VTR tables.

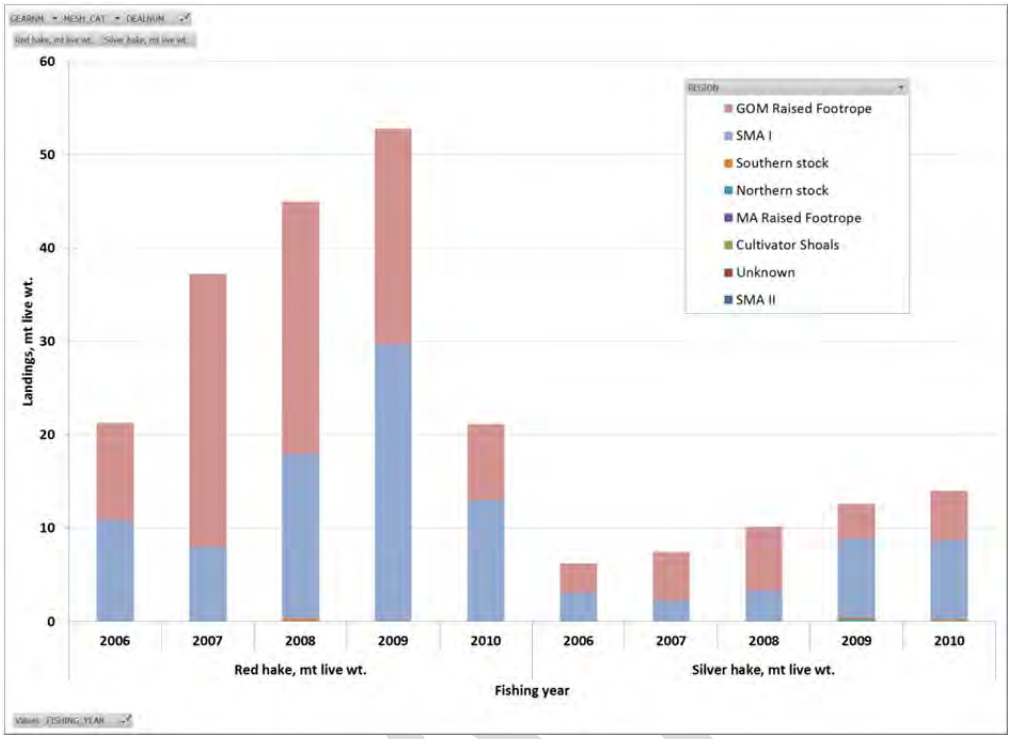
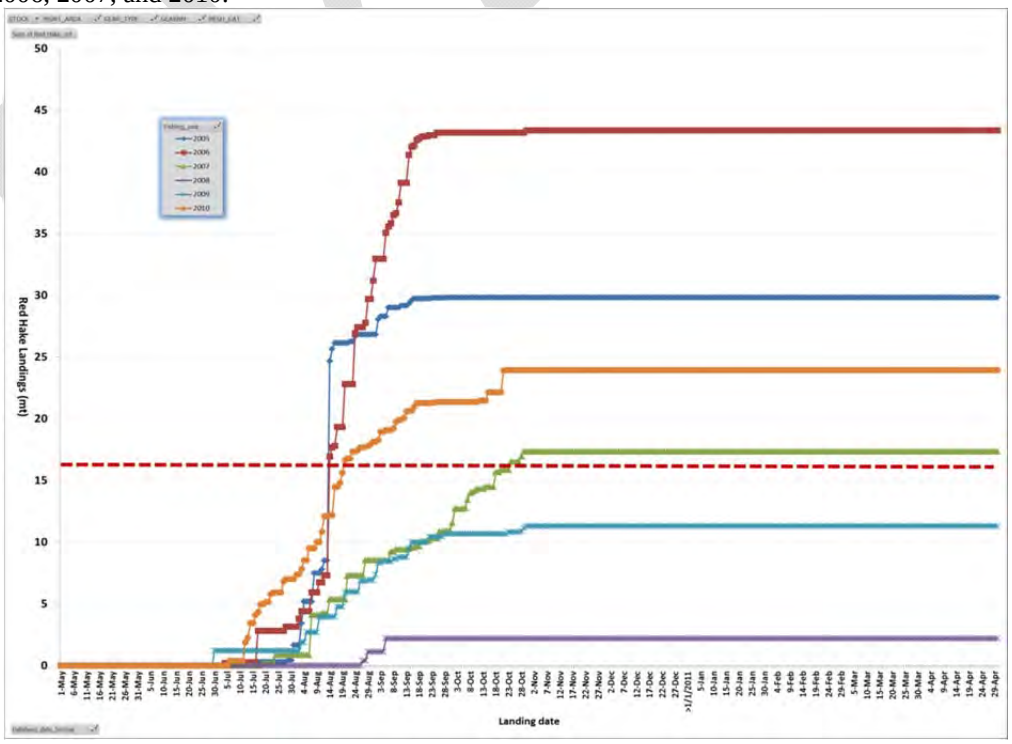


Figure 12. Daily cumulative red hake landings (including transfers at sea for bait) from the Cultivator Shoals Area program compared to 2012-2014 landings target (red dashed line). Landings exceeded the target in 2005, 2006, 2007, and 2010.



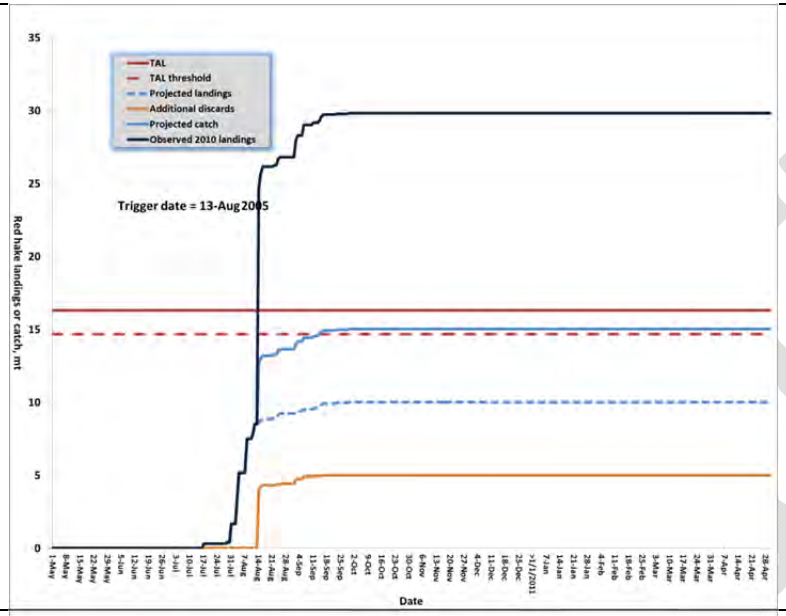
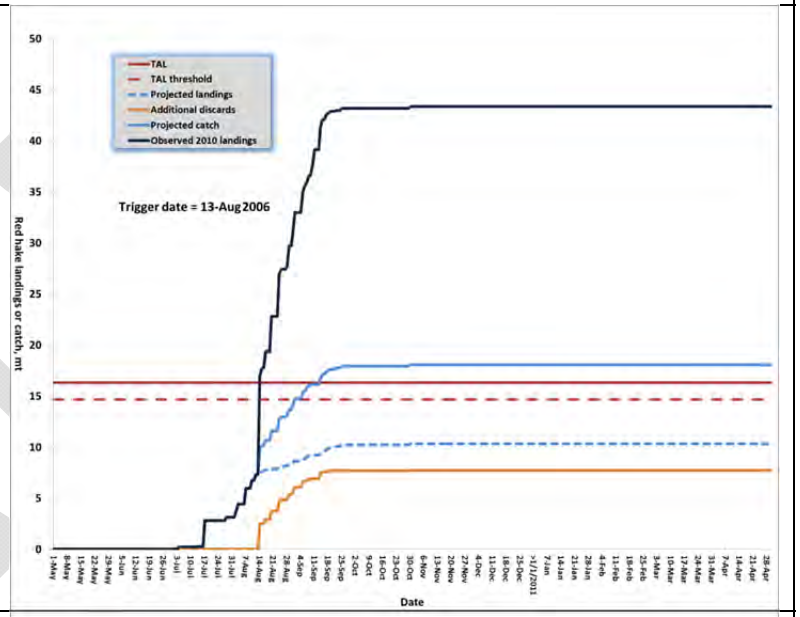
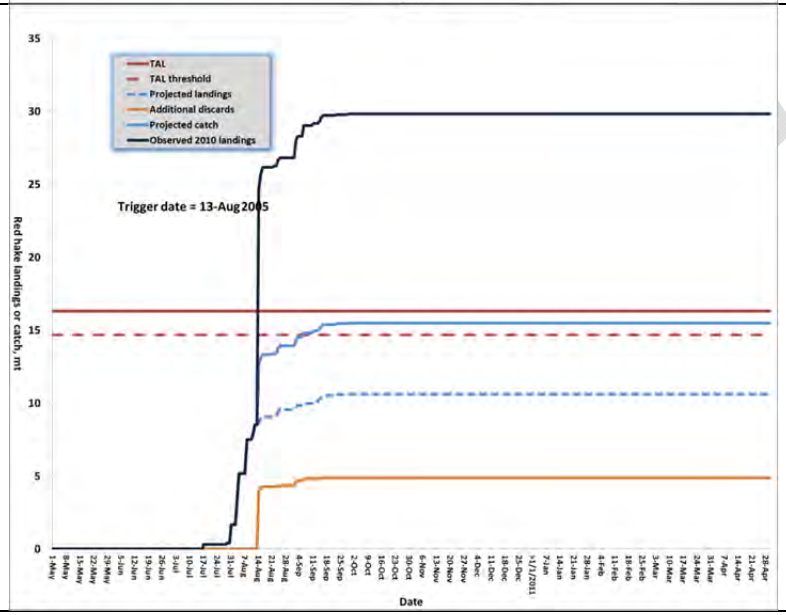
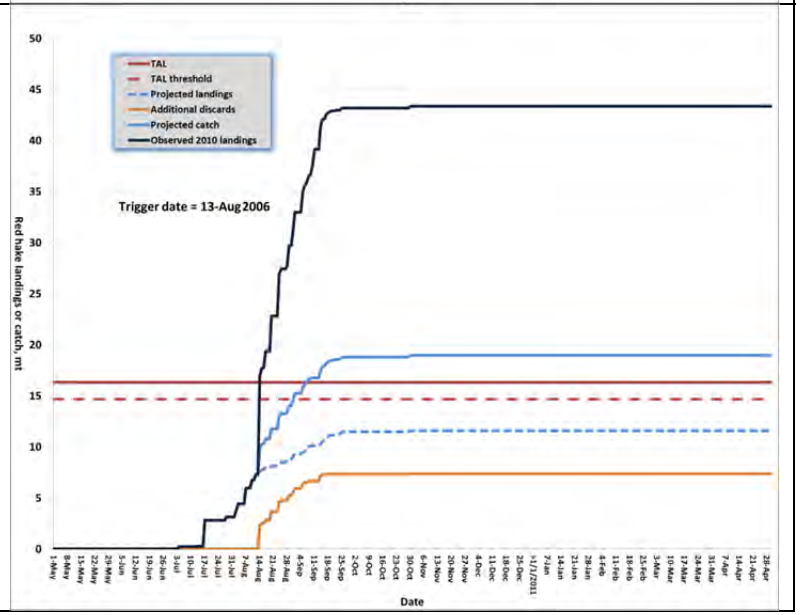
If the accountability measures had been in place during 2005 and 2006, red hake landings and catch would have been significantly reduced compared with actual results without an accountability measure, because most of the trips in the Cultivator Shoals Area were targeting hakes and some trips had a high proportion of red hake. Using the assumptions adopted by the PDT (see Document 1 of the Appendix), the effects on landings, catch and number of trips with curtailed landings is summarized in the table below.

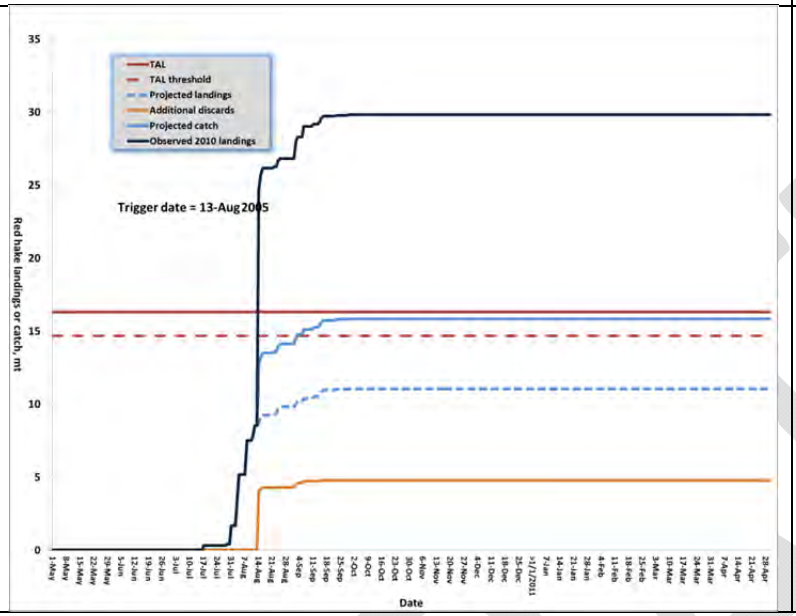
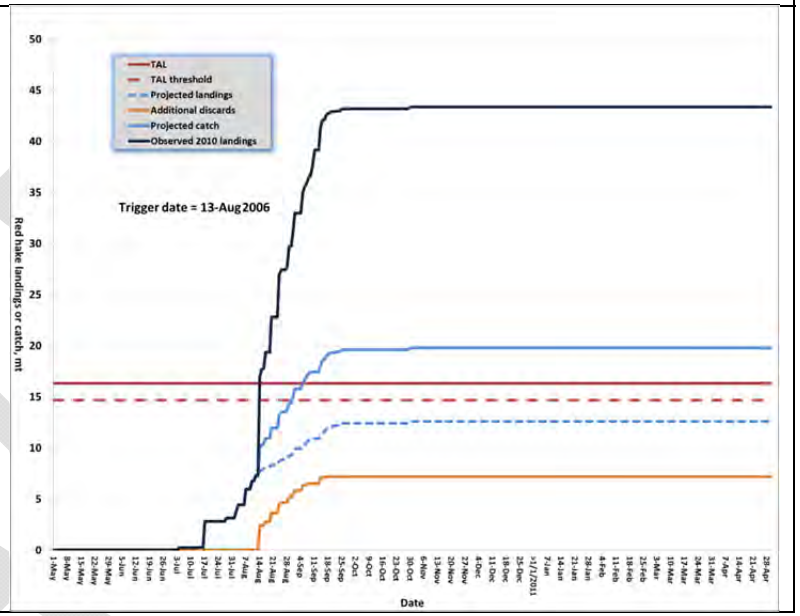
Landings are predicted to decline from 83.5 to 92.9% with catch declining by 59.7 to 68.2% (Table 55). Nine to fourteen trips (47.4-73.7%) would have been affected in 2005 and 24-34 trips (60.0-85.0%) in 2006. Discards however would increase by a considerable amount under any possession limit alternative, increasing to 1.44 to 3.50 times predicted landings. With any alternative, possibly excepting 400 lbs. in 2006, the PDT analysis suggests that any of the alternatives would keep landings below or near the target and significantly reduce catch (Figure 13).

Table 55. Predicted effects of various AM incidental possession limits for red hake caught in the Cultivator Shoals Area program based on historical trip data.

Fishing year	2005			2006		
Incidental possession limit	200	300	400	200	300	400
Predicted landings reduction	-92.9%	-90.1%	-88.1%	-90.6%	-86.6%	-83.5%
Predicted red hake revenue reduction	-92.9%	-90.1%	-88.1%	-90.6%	-86.6%	-83.5%
Predicted catch reduction	-68.2%	-66.0%	-64.0%	-65.9%	-63.0%	-59.7%
Discard to kept ratio	349.6%	243.9%	201.7%	262.8%	176.6%	143.9%
Proportion of trips affected	73.7%	52.6%	47.4%	85.0%	65.0%	60.0%
Trips affected	14	10	9	34	26	24

Figure 13. Cultivator Shoals Area program AM effectiveness at various possession limit alternatives.

AM possession limit	2005 fishing year	2006 fishing year
200 lbs.		
300 lbs.		

AM possession limit	2005 fishing year	2006 fishing year
400 lbs.		

Applying the same analysis to 2007 and 2010 trips, fishing years when landings also exceeded the proposed landings target, gives similar results as the analysis for the 2005 and 2006 fishing years. Landings would have been reduced by 41.8 to 81.1% and catches by 24.6 to 57.3%. Affected trips would have ranged from 6 to 31 trips. Fewer trips were affected in 2007 because fewer red hake landings from the Cultivator Shoals Area occurred after the trigger date. However the affected trips in 2010 were more frequently targeting hakes (both silver and red) and therefore the effect on red hake landings was predicted to be less.

In fishing years when landings exceeded the proposed target (2005-2007,2010), landings reached the 90% trigger between Aug 9 and Aug 16 (???). In 2005, 2007, and 2010, the 90% trigger is predicted to be sufficient to prevent catch (landings and additional discards) from exceeding the landings target. In 2006, however, landings exceeded the proposed target by a substantial amount, and to prevent the predicted catch from exceeding the target, the trigger would have to be scaled back to 27-37% of the target, reducing the incidental possession limit as early as Aug 2 to Aug 9, depending on the chosen possession limit.

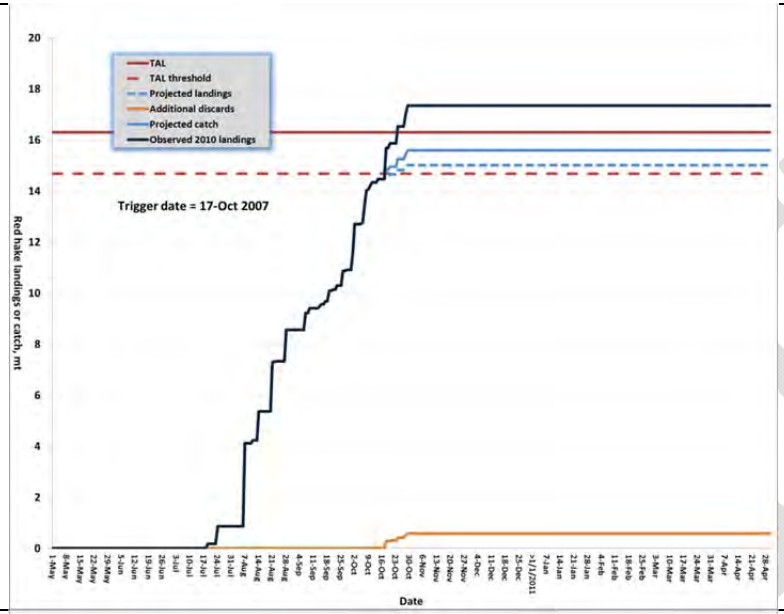
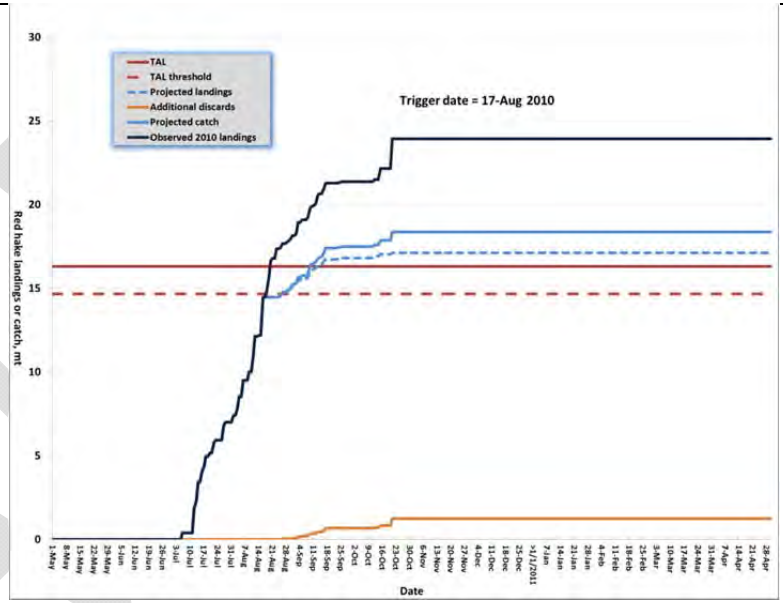
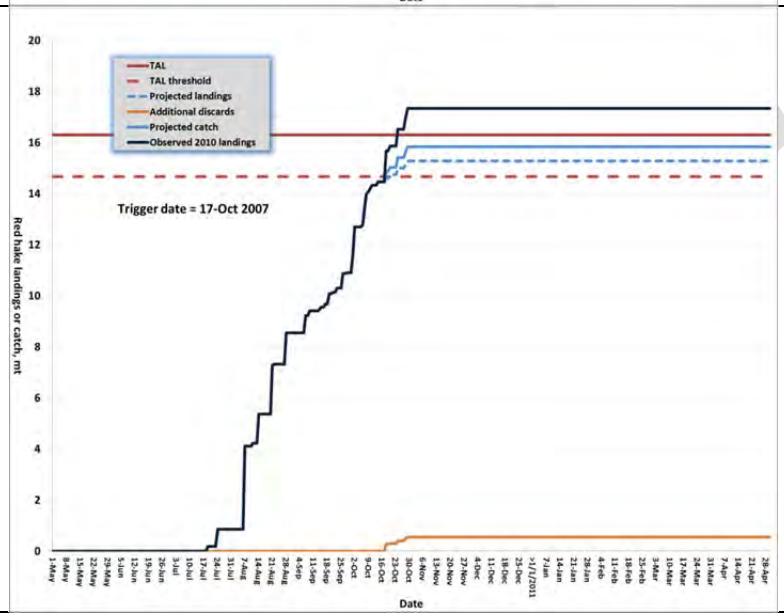
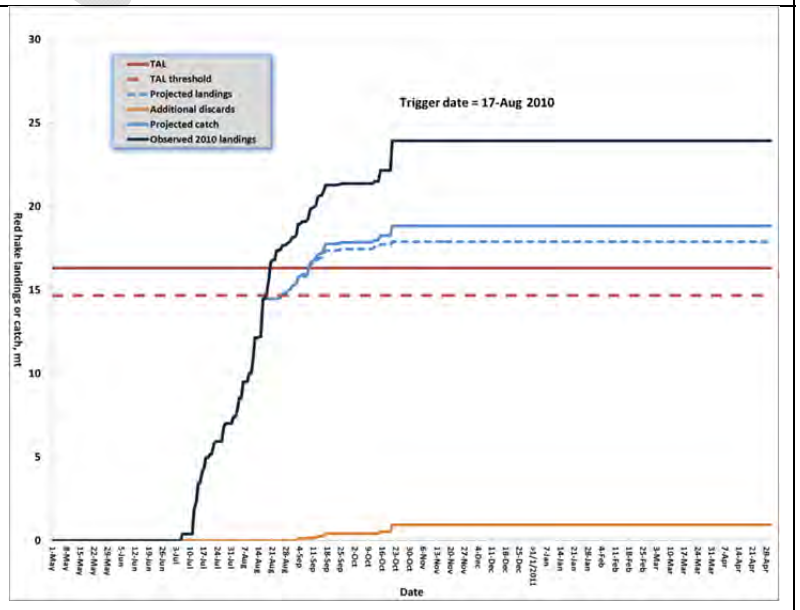
No transfers of sea of red hake were reported for trips fishing in the Cultivator Shoals Area between 2006 and 2010. Therefore no impact on the bait fishery by the incidental red hake possession limit is expected.

In summary, the proposed accountability measure alternatives for the Cultivator Shoals Area appear to be sufficient to keep landings and associated catch of red hake below or near the target. These results are dependent on changes in fishing behavior and are sensitive to assumptions about them. If fishermen are unable to avoid red hake while fishing for silver hake, or do not change fishing behavior, then landings might stay below the target, but catches would be not much different than they would be without the accountability measure.

Table 56. Predicted effects of various AM incidental possession limits for red hake caught in the Cultivator Shoals Area program based on historical trip data.

Fishing year	2007			2010		
Incidental possession limit	200	300	400	200	300	400
Predicted landings reduction	-81.1%	-71.7%	-62.2%	-60.7%	-48.2%	-41.8%
Predicted red hake revenue reduction	-81.1%	-71.7%	-62.2%	-60.6%	-48.2%	-41.7%
Predicted catch reduction	-57.3%	-46.7%	-38.4%	-35.4%	-28.6%	-24.6%
Discard to kept ratio	126.1%	88.2%	63.0%	64.5%	37.9%	29.5%
Proportion of trips affected	100.0%	100.0%	100.0%	59.6%	32.7%	21.2%
Trips affected	6	6	6	31	17	11

Figure 14. Cultivator Shoals Area program AM effectiveness at various possession limit alternatives.

AM possession limit	2007 fishing year	2010 fishing year
200 lbs.		
300 lbs.		

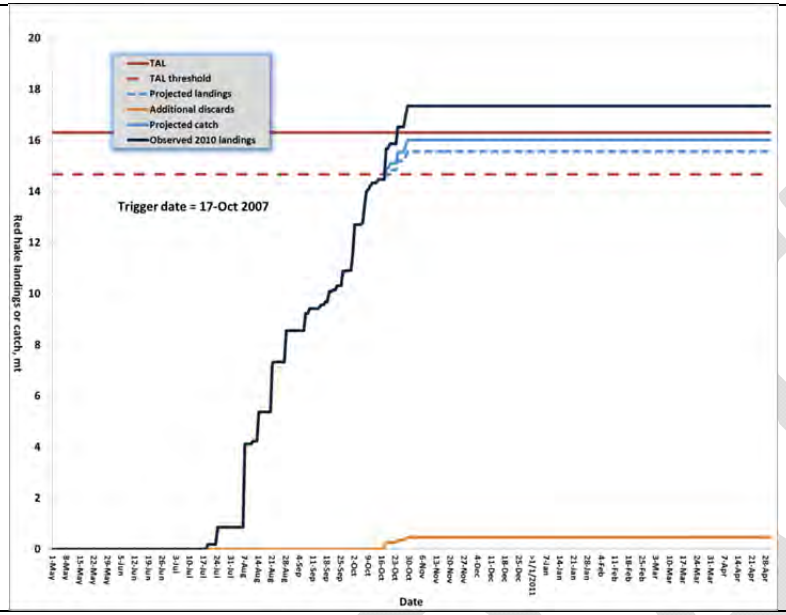
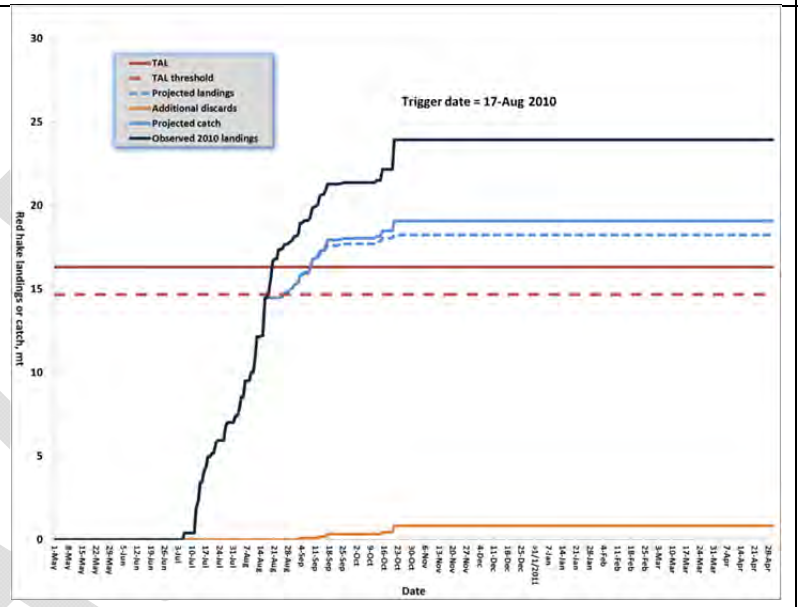
AM possession limit	2007 fishing year	2010 fishing year
400 lbs.		

Table 57. Trigger dates predicted to keep red hake catches below the Cultivator Shoals Area program landings target with various AM incidental limit alternatives.

Incidental possession limit	200 lbs.	300 lbs.	400 lbs.	90% trigger date
2005	90%	90%	90%	Aug 13
2006	37% Aug 9	36% Aug 6	27% Aug 2	Aug 13
2007	90%	90%	90%	Aug 9
2008	Landings did not reach the 90% AM trigger			
2009	Landings did not reach the 90% AM trigger			
2010	88% Aug 15	88% Aug 15	88% Aug 15	Aug 16

Inshore Small Mesh Area accountability measures (Section 5.4.3.1)

Since 2006, red hake landings including transfers at sea exceeded the proposed landings target only once, in 2009 (Figure 15; Table 54). Landings reached 67.7 mt and exceeded the 90% AM trigger on Aug 15.

Table 7 and Figure 8 summarize the predicted effectiveness of the proposed incidental possession limit alternatives to constrain landings and catch. Estimated landings decline by 59.5% with a 400 lbs. possession limit and by 77.5% with a 200 lbs. possession limit, affecting 32 to 43 trips which otherwise would have landed more than the proposed incidental possession limits. Assuming fishing behavior is consistent with the PDT's assumptions and fishermen are able to target other species and avoid catching red hake on some trips, additional discards are within acceptable limits, increasing to 59.7 to 115.4% of adjusted landings. Catches would therefore decline by 35.2% with a 400 lbs. possession limit, by 41.3% with a 300 lbs. possession limit and by 51.5% with a 200 lbs. possession limit.

For any of the proposed red hake incidental possession limit alternatives, the AM will keep landings and catch below the inshore small mesh area program landings target, based on expected fishery performance using 2009 data when landings exceeded the proposed 51.3 mt landings target. If fishermen are targeting species like silver hake and are unable to change fishing behavior and avoid catching red hake, then the proposed AMs will be less effective at keeping catches within proposed limits.

Unlike the Cultivator Shoals Area Program potential effectiveness described above, more vessels in the inshore small mesh areas target red hake with small mesh, rather than silver hake. In those cases, fishermen would be less likely to take trips or will fish for other species. Thus the AMs for the inshore small mesh areas are likely to be more effective than in areas where vessels target other species and land a minor amount of red hake.

The combined effect on red hake landings at dealers and those reported as transfers at sea for bait could not be analyzed because it is not possible to know whether these landings occurred on the same or on different trips, using the existing data. A separate analysis of the effect of the incidental red hake possession limits on transfers at sea is summarized in Table 59, for the 2009 fishing year, when landings exceeded the proposed TAL (Figure 15) and met the 90% TAL trigger on Aug 15. Table 59 summarizes the number of trips with reported transfers at sea that would be affected by each possession limit alternative and the expected reduction in transfers at sea, not taking into account the possibility that vessels could take more 'trips' to compensate or simply possess no more than the limit, by offloading catch to other vessels more frequently.

If triggered on Aug 15, a 200 lbs. possession limit would have affected 30 out of the 80 trips (37.5%) with reported transfers at sea in the small mesh areas. Landings would decline by 21.4%. In contrast, a 400 lbs. possession limit would affect nearly the same number of trips (24) and reduce landings by almost the same amount (16.0%). Although there would be meaningful impacts on the bait fishery if an incidental limit became effective, the differences between the 200, 300, and 400 lbs. alternatives is small. Furthermore, vessels could mitigate the impacts by taking more 'trips', offloading catch to another vessel more frequently, or fishing for silver hake for bait, rather than red hake.

Figure 15. Daily cumulative red hake landings (including transfers at sea for bait) from the Small Mesh Area programs (Small Mesh Area I, Small Mesh Area II, Gulf of Maine Raised Footrope, MA Raised Footrope) compared to 2012-2014 landings target (red dashed line). Landings exceeded the target in, 2009.

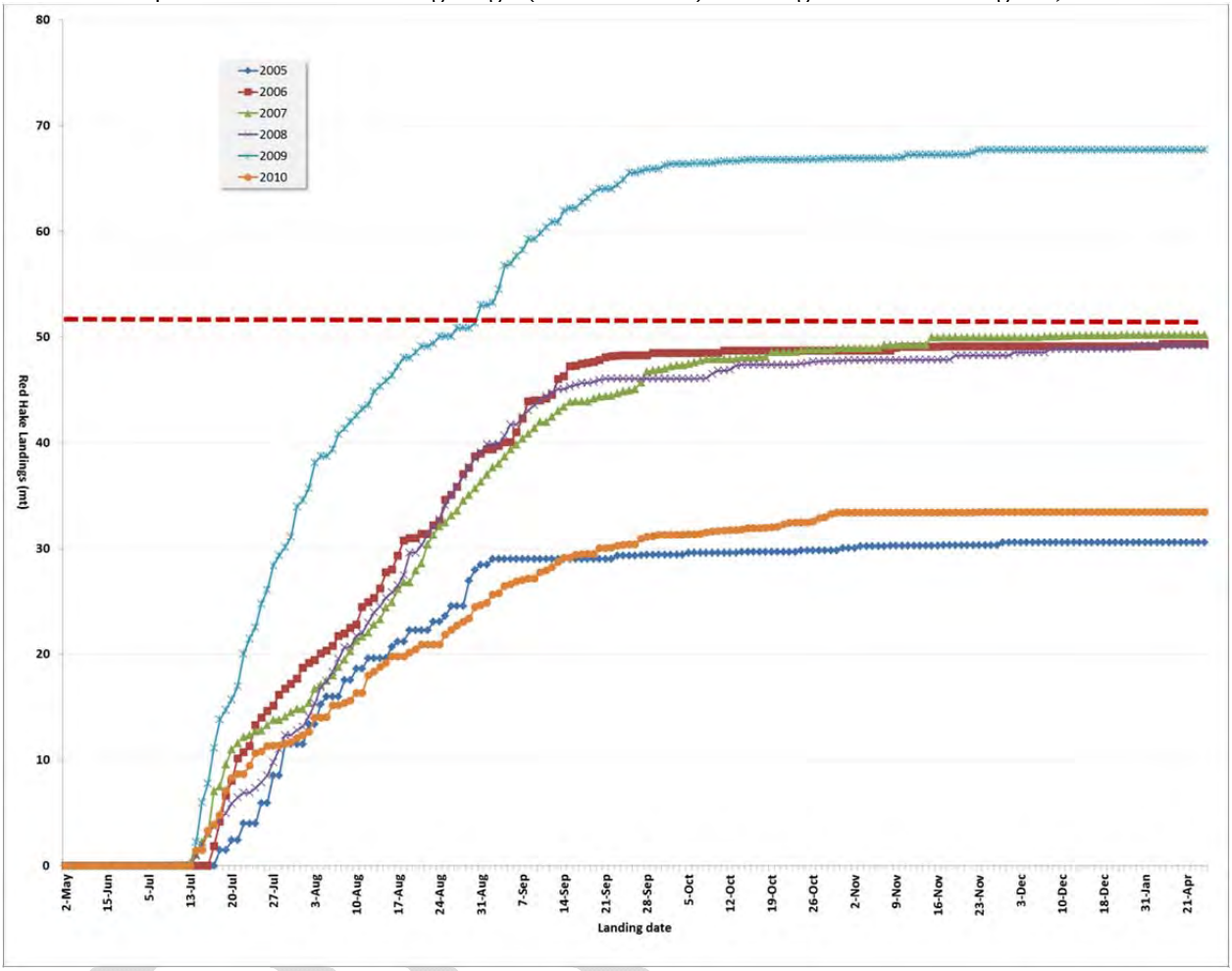
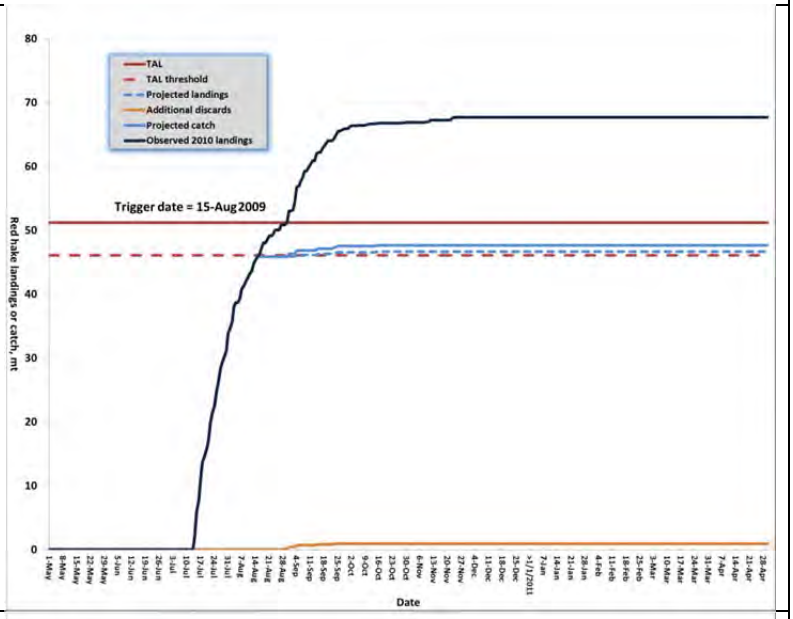
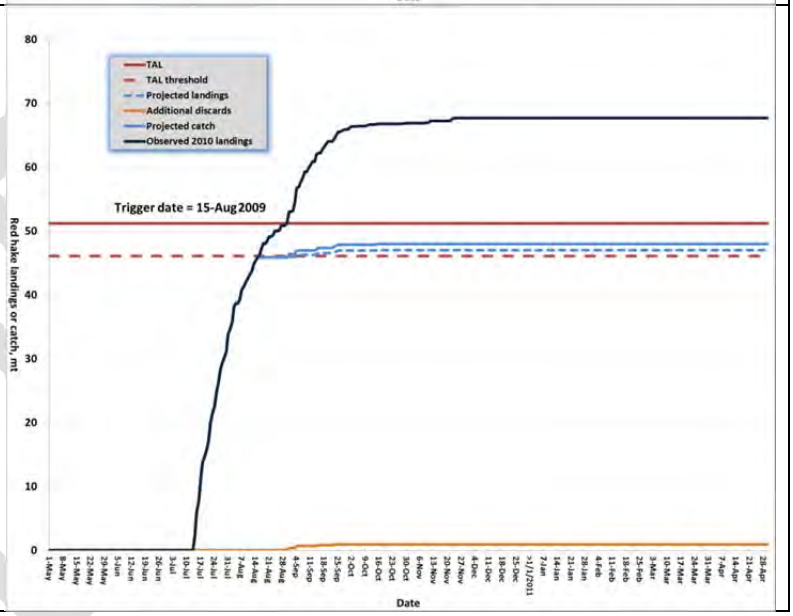


Table 58. Predicted effects of various AM incidental possession limits for red hake caught in the Small Mesh Area programs based on historical trip data**.**

Fishing year	2009		
Incidental possession limit	200	300	400
Predicted landings reduction	-77.5%	-67.9%	-59.5%
Predicted red hake revenue reduction	-77.5%	-68.0%	-59.5%
Predicted catch reduction	-51.5%	-41.3%	-35.2%
Discard to kept ratio	115.4%	83.1%	59.7%
Proportion of trips affected	78.2%	74.5%	58.2%
Trips affected	43	41	32

Figure 16. Small Mesh Area programs AM effectiveness at various possession limit alternatives.

AM possession limit	2009 fishing year
200 lbs.	
300 lbs.	

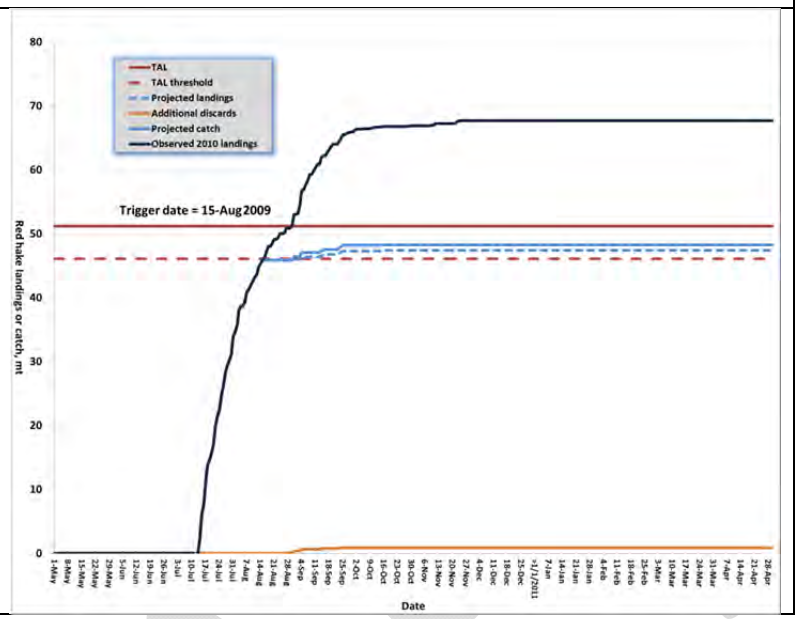
AM possession limit	2009 fishing year
400 lbs.	

Table 59. Effects of a triggered red hake incidental possession limit on inshore small mesh area trips with reported transfers at sea for bait after the TAL trigger date.

Fishing year	2009	2009	2009
Incidental possession limit (lbs.)	200	300	400
Trips	80	80	80
Total landings (mt)	27.4		
Trigger date	15-Aug	15-Aug	15-Aug
Revised landings (mt)	21.5		
Reduction	-21.4%	-18.6%	-16.0%
Trips affected	30	29	24
Proportion	37.5%	36.3%	30.0%

8.1.1.4.2.2 Northern stock area (Section 5.4.1)

Annual and cumulative daily red hake landings for the northern stock area are summarized in Table 60 and Figure 17. Landings were below the proposed 90.3 mt TAL in every year since 2004, except for 2006 when 95 mt were landed. Landings would have exceeded the 90% TAL trigger on Sep 7, 2006.

If the incidental possession limits had been triggered in 2006 when landings exceeded the 90% TAL trigger, as proposed in this amendment's accountability measure alternatives (Section 5.4.1), it would have reduced landings by 78.6% with a 400 lbs. possession limit and by 88.4% with a 200 lbs. possession limit (Table 61). Additional discards would have been somewhat higher for the northern stock area than for the small mesh area programs, because the affected trips include more that target other species, some using large mesh or other gears. Seventy-one trips after Sep 7 would have been affected with a 400 lbs. possession limit, 76 trips with a 300 lbs. possession limit, and 86 trips with a 200 lbs. possession limit.

Provided that fishermen change fishing behavior as assumed by the PDT[11] (see Document 3 in the Appendix), then additional discards would range from 1.1 to 2.1 times the predicted landings made after Sep 7. Therefore catches would decline by 54.8% with a 400 lbs. possession limit, by 58.9% with a 300 lbs. limit, and by 63.4% with a 200 lbs. possession limit. Under these assumptions, landings and catch would have stayed under the TAL (Figure 18), although more discarding would have occurred with a 200 lbs. possession limit, than either a 300 or 400 lbs. possession limit. If fishermen are unable to avoid catching or fishing for red hake as much as assumed, however, these incidental possession limit alternatives would be less effective of reducing catch to keep it below the TAL.

The combined effect on red hake landings at dealers and those reported as transfers at sea for bait could not be analyzed because it is not possible to know whether these landings occurred on the same or on different trips, using the existing data. A separate analysis of the effect of the incidental red hake possession limits on transfers at sea is summarized in Table 62, for the 2006 fishing year, when landings exceeded the proposed northern stock area TAL (Figure 17) and met the 90% TAL trigger on Sep 7. Table 62 summarizes the number of trips with reported transfers at sea that would be affected by each possession limit alternative and the expected reduction in transfers at sea, not taking into account the possibility that vessels could take more 'trips' to compensate or simply possess no more than the limit, by offloading catch to other vessels more frequently.

If triggered on Sep 7, a 200 lbs. possession limit would have affected 9 out of the 58 trips (15.5%) with reported transfers at sea in the small mesh areas. Landings would decline by 5.5%. In contrast, a 400 lbs. possession limit would affect half of the trips (5) with reported bait sales after Sep 7 and reduce landings by about half (2.4%) of the reduction expected with a 2000 lbs. possession limit. Unlike what might occur in the small mesh areas if a TAL trigger applied there, the TAL trigger for the northern stock area would be met later in the year, most likely after the demand for bait had abated. The effects of the stock wide TAL trigger and incidental limits is therefore expected to be low.

[11] The PDT assumed that fishermen would not change fishing behavior at all and would discard the excess when revenue from hakes was less than 75% of the trip total revenue. If hake revenue was greater than 75% and the red hake catch was less than twice the possession limit, then only 50% of trips would avoid catching excess red hake. If red hake landings were greater than twice the possession limit and hake revenue was greater than 75% of the trip total revenue, then 75% of the trips would avoid catching excess red hake and discard the surplus.

Table 60. Total landings of red hake reported by dealers and (post 2006) by fisherman as transfers at sea on VTRs. Source: NMFS SAFIS and VTR data tables.

Red hake, mt. live	STOCK	
YEAR	Northern Stock	Southern Stock
1994	716	1,021
1995	146	1,272
1996	380	912
1997	321	932
1998	168	1,259
1999	221	1,351
2000	169	1,582
2001	196	1,067
2002	240	649
2003	186	605
2004	71	548
2005	66	333
2006	95	377
2007	70	505
2008	52	638
2009	85	573
2010	68	370

Figure 17. Daily cumulative red hake landings (including transfers at sea for bait) northern stock area compared to 2012-2014 landings target (red dashed line). Landings exceeded the target only in 2009.

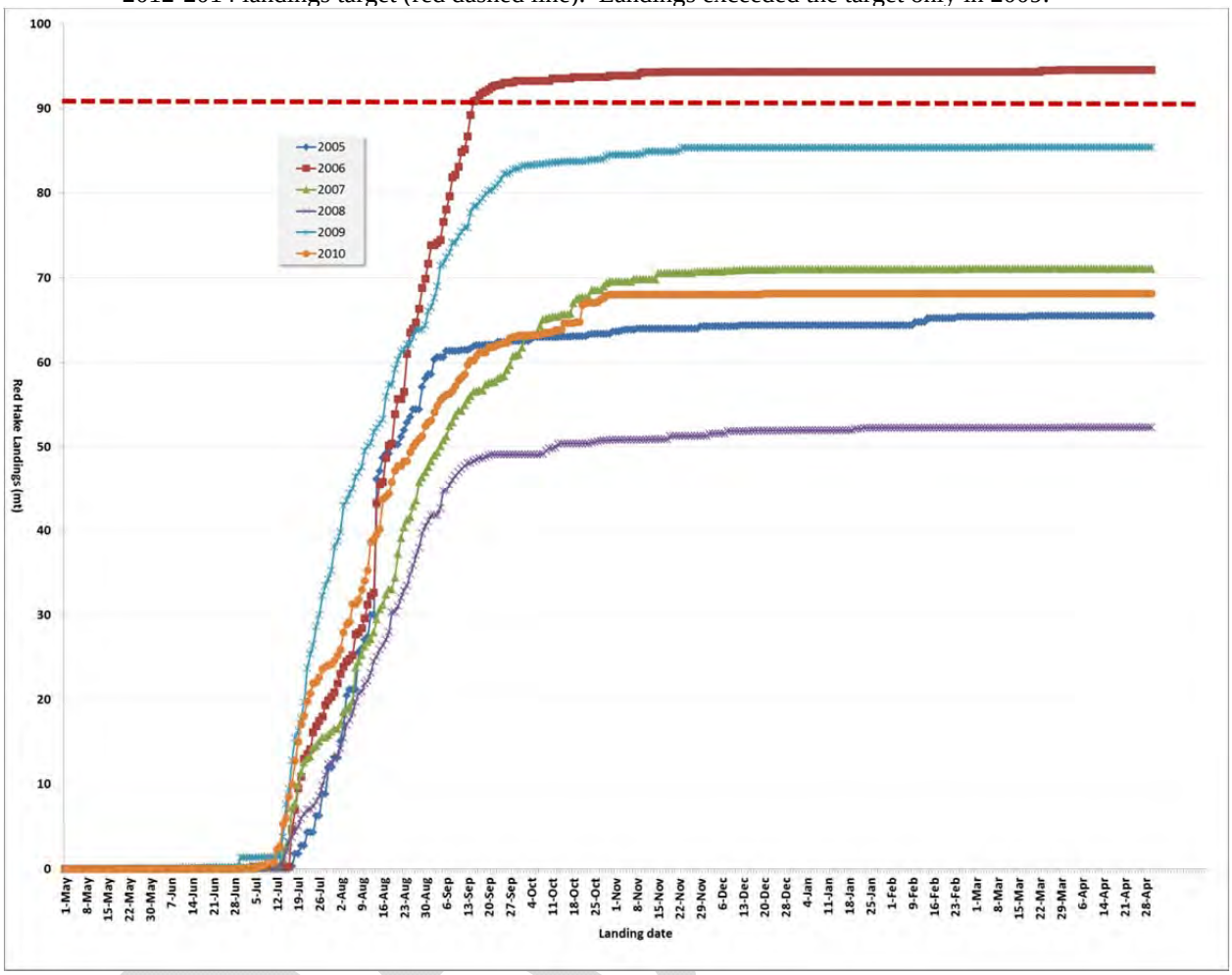
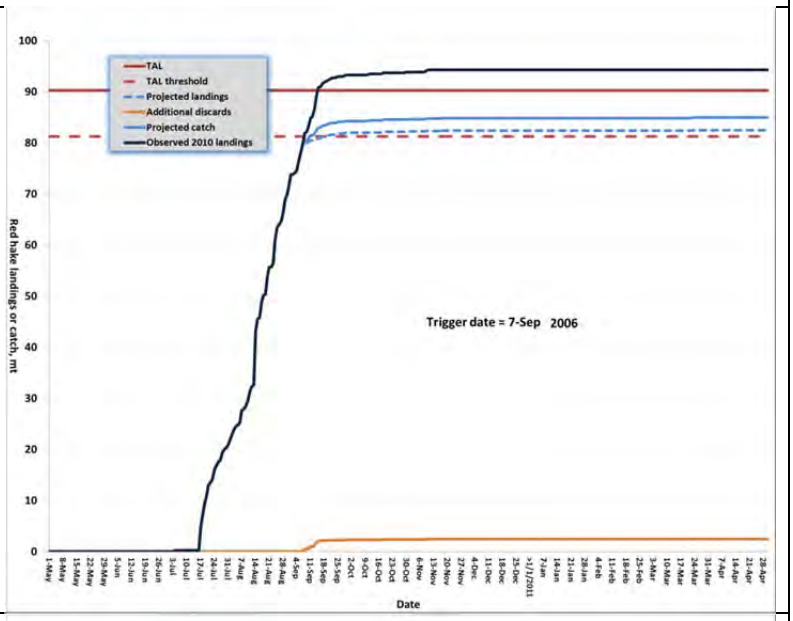
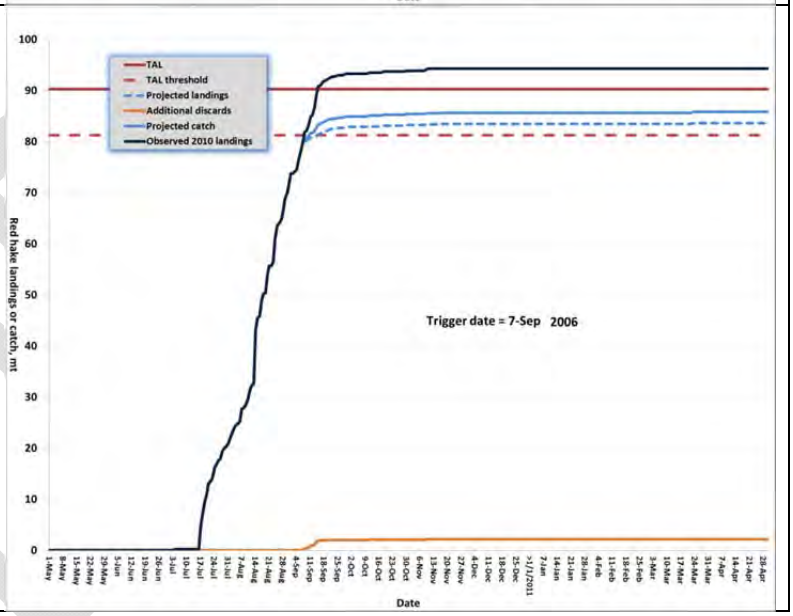


Table 61. Predicted effects of various AM incidental possession limits for red hake caught in the northern stock area based on historical trip data.

Fishing year	2006		
Incidental possession limit	200	300	400
Predicted landings reduction	-88.4%	-83.2%	-78.6%
Predicted red hake revenue reduction	-88.3%	-83.0%	-78.5%
Predicted catch reduction	-63.4%	-58.9%	-54.8%
Discard to kept ratio	214.0%	144.4%	111.9%
Proportion of trips affected	78.9%	69.7%	65.1%
Trips affected	86	76	71

Figure 18. Northern stock area AM effectiveness at various possession limit alternatives.

AM possession limit	2006 fishing year
200 lbs.	
300 lbs.	

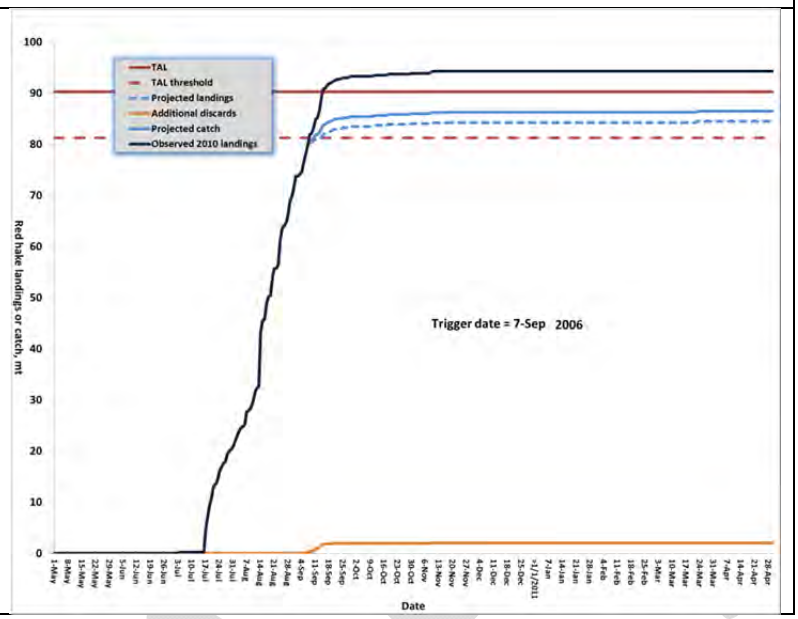
AM possession limit	2006 fishing year
400 lbs.	

Table 62. Effects of a triggered red hake incidental possession limit on northern stock area trips with reported transfers at sea for bait after the TAL trigger date.

Fishing year	2006	2006	2006
Incidental possession limit (lbs.)	200	300	400
Trips	58	58	58
Total landings (mt)	21.3		
Trigger date	7-Sep	7-Sep	7-Sep
Revised landings (mt)	1		
Reduction	-5.5%	-3.8%	-2.4%
Trips affected	9	7	5
Proportion	15.5%	12.1%	8.6%

8.1.1.4.2.3 Southern stock area (Section 5.6.1)

Red hake landings in the southern stock area have ranged from 370 mt in 2010 to 1,582 mt in 2000. Landings exceeded the proposed 1,336 mt TAL only in 1999 and 2000 (Table 60; Figure 19), well before many of the current groundfish management measures were implemented via Amendments 13 and 16. Under the current management regime, red hake landings have been well below the proposed TAL, so it is not possible to use existing data from relatively recent trips to evaluate the effectiveness of the incidental red hake possession limits as AMs. Landings would have to more than double for in-season AMs to become effective and for that to happen would require significant increases in biomass, price, or both. If there were significant increases in biomass, then it's probable that they would also trigger increases in ACL specifications.

In the unlikely event that in-season AMs were triggered in the southern stock area (see Section 5.6.1), then a 400 lbs. possession limit would be less likely to discourage fishing for red hake than a 200 lbs. limit, but would induce fewer discards. Table 63 summarizes the potential effects if the incidental limit were imposed year-around, including the number and proportion of trips with red hake landings higher than the possession limits.

Few reports of red hake (or silver hake) transfers at sea for bait occur in the southern stock area, and nearly all the landings are reported by dealers. The effects of potential incidental possession limits is therefore expected to be negligible.

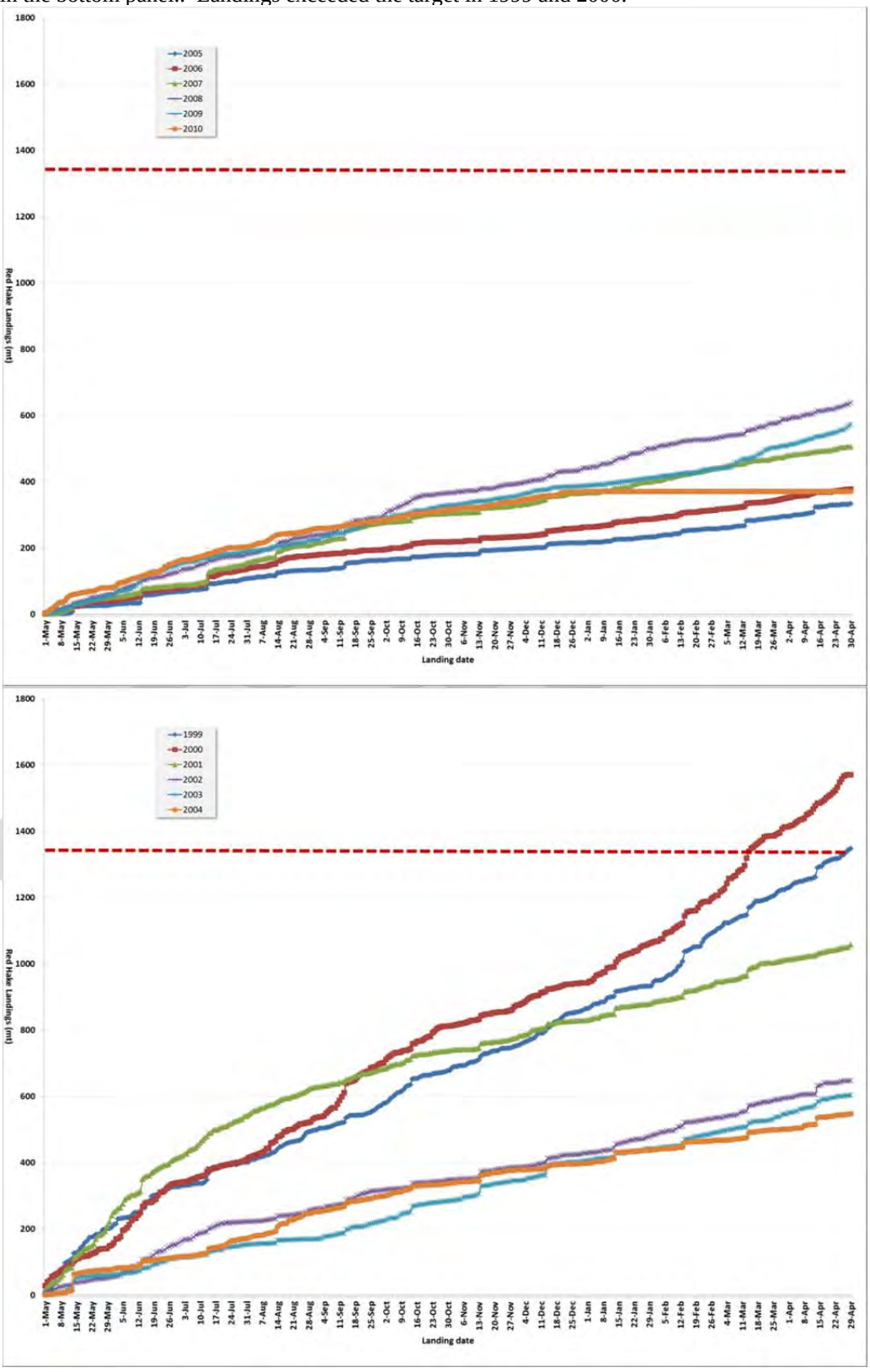
8.1.1.4.3 Status Quo/No Action (Section 5.6.3)

This alternative would result in no proactive, or in-season, AMs being implemented. This would have a potentially negative impact on the small-mesh multispecies stocks because it would not guarantee that catch and landings would stay within the limits recommended by the SSC and may result in a greater risk of overfishing than the preferred alternative.

Table 63. Predicted effects of various AM incidental possession limits for red hake caught in the southern stock area based on 2009 fishing year trip data (the last complete year available).

Fishing year	2009		
Incidental possession limit	200	300	400
Predicted landings reduction	-70.3%	-61.0%	-53.8%
Predicted red hake revenue reduction	-70.5%	-61.3%	-54.0%
Predicted catch reduction	-29.8%	-25.4%	-22.0%
Discard to kept ratio	136.1%	91.5%	68.8%
Proportion of trips affected	36.6%	28.7%	23.5%
Trips affected	1,280	1,006	824

Figure 19. Daily cumulative red hake landings (including transfers at sea for bait) southern stock area compared to 2012-2014 landings target (red dashed line). 2005-2010 data are plotted in the top panel, 1999-2004 data in the bottom panel.. Landings exceeded the target in 1999 and 2000.



8.1.1.4.4 Status Quo/No Action (Section 5.6.3)

This alternative would result in no proactive, or in-season, AMs being implemented. This would have a potentially negative impact on the small-mesh multispecies stocks because it would not guarantee that catch and landings would stay within the limits recommended by the SSC and may result in a greater risk of overfishing than the preferred alternative.

8.1.1.5 Year around possession limits

The Oversight Committee and Advisors also included in Draft Amendment 19 alternatives for red hake possession limits by mesh size, similar to existing limits for silver hake. These limits would help to prevent red hake from becoming a choke species for vessels targeting silver hake, promote fishing with larger more size selective mesh, while allowing for customary red hake landings on the majority of trips.

8.1.1.5.1 Red hake possession limits (Sections 5.7.1 and 5.7.2)

The intent of a high year around possession limit for red hake is to prevent fishermen from targeting large quantities of red hake when they anticipate that landings will exceed the 90% TAL trigger and the directed fishery would be closed by an incidental possession limit. This measure is very similar to the 20,000 lbs. skate bait possession limit which also prevents vessels from landing large quantities of skates, flooding the market, and triggering a premature closure of the fishery. But in addition, the Council wants to encourage fishermen to not use very small mesh (i.e. < 2.5 inches) to target red hake because doing so would catch more small fish, decreasing yield per recruit.

The year around red hake possession limit is not meant to reduce landings and catch. Therefore the range of potential values is meant to accommodate most if not all fishing activity. By the same token, it would affect trips that are targeting red hake the most and therefore is most likely to affect fishing behavior, rather than simply create regulatory discarding. Trips targeting red hake will either return to port early if their catch reaches the possession limit, or fish elsewhere for other species. It is unlikely that fishermen will compensate by taking more frequent trips to target red hake, due to relatively low price.

A preliminary analysis of trip data (see Document 3 in the Appendix), indicated a potential range of red hake possession limits which varied by stock area, gear, and mesh size. Vessels using greater than 2.5 inch (but less than 5.5 inch large mesh) tended to land higher quantities.

There is no selectivity data to confirm that using larger mesh will improve size selectivity. And it is therefore not known to what extent this measure would help reduce mortality on small red hake. Many times selectivity depends on conditions, the behavior and response of the subject fish to the net, the tow duration, and what else is caught in the trawl net. But in general, size selectivity improves with larger mesh, particularly for gadiform fish, like red hake. Vessels that are using very small mesh (i.e. < 2.5 inches) to target other species, e.g. northern shrimp and herring, are unlikely to switch to larger mesh. But by the same token, the measure would prevent these vessels from increasing effort on red hake if red hake prices increase in response to an impending incidental possession limit.

The Whiting PDT examined silver to red hake landings ratios on trips landing at least one pound of red hake, by mesh size and stock area. The intention was to use the data to provide some guidance applying

these ratios to the silver hake possession limits to derive potential red hake possession limits. In the northern stock area, most of the trips used 2.5-4.5 inch mesh (mostly 3 inch mesh in the small mesh exemption programs), or were trips without matching VTR serial numbers (hence no recorded mesh size). The PDT also examined these ratios by the percent of trip revenue from hake landings to determine whether this ratio was different on trips targeting other species.

The average silver hake to red hake landings ratio in the northern stock area was 6:1 to 11:1 on trips targeting hakes (>75% revenue) and 3:1 to 8:1 on mixed species trips (45-75% hake revenue). Trips landing red hake in the northern area when using mesh < 2.5 inches or > 4.5 inches was more sparse, but the silver to red hake landings ratio ranged from 6:1 to 9:1 (Figure 20). Thus with a 30,000 lbs. silver hake possession limit for large mesh, a reasonable red hake limit might range from 3,000 to 5,000 lbs. And with a 3,500 lbs. silver hake limit for vessels using less than 2.5 inch mesh, the landings ratio of 6:1 implies a 500 lbs. limit. Very few trips landed more than these amounts, however.

In the southern stock area (Figure 21), there are considerably more trips landing red hake with small (<2.5") and large (>4.5") mesh. For trips using 3" mesh and for trips without matching VTRs, the ratio of silver hake to red hake landings is about 3.5:1 to 4.5:1 for trips targeting hake, suggesting that with a 30,000 lbs. silver hake possession limit, an appropriate red hake possession limit might be about 6,500 to 9,000 lbs. But very few trips landed more than 7,500 lbs. For small mesh (<2.5") trips, trips targeting hakes had an average silver hake to red hake landings ratio of 1.2:1 to 2.2:1. And with a 3,500 to 7,500 lbs. silver hake limit, these data suggest that a red hake limit around 3,000 lbs. might be appropriate.

Based on this analysis and more details in Document 3 (see Appendix), the Council chose an alternative with a possible range of possession limits. In the southern stock area, the alternative includes a range of 1,000 to 3,000 lbs. for vessels using 2.5 to 5 inch square or diamond cod end mesh, and 2,000 to 6,000 lbs. for all other gears and cod end meshes.

The impacts on trips landing red hake while using 2.5 to 4.5 inch mesh in the northern area, and on landings and catch, is summarized in Table 64 for the range of the proposed possession limit and for a mid-point. Over a five year period from 2006-201, the 1,000 lbs. possession limit would have affected 126 trips (28.8%), reduced landings by 44.4%, reduced catch by 24.5% (if vessels react as assumed in the Document 3 analysis), increasing discards by 0.358 of the landings. On the high end of the possession limit range, the measure would have affected 23 trips (5.3%), reduced landings by 15.0%, reduced catch by 6.1%, increasing discards by 0.053 of the landings. More recently in 2010, vessels landed less red hake and the proposed possession limits would have had less effect. At 1,000 lbs., the possession limit would have reduced landings by 24.6%, reduced catch by 7.9%, and increased discards by 0.222 of landings. At 3,000 lbs., only two trips would have been affected by the proposed limit, reducing landings by 1.2%, but the important point (and the intent of this measure) is to prevent INCREASES in fishing effort targeting red hake in anticipation of a directed fishery closure at the 90% TAL trigger.

The expected effects for vessels using other gears and meshes in the northern stock area is summarized in Table 65, with possession limits ranging from 300 to 1,200 lbs. and a mid-point of 750 lbs. Over the 2006-2010 period, the 300 lbs. possession limit would have affected only 22 trips, reducing landings for this group by 26.4%, reducing catch by 6.8% and increasing discards to 0.265 of landings. Higher possession limits and all possession limits in 2010 would have affected very few trips, but could prevent increases in fishing effort targeting red hake.

In the southern stock area, the alternative includes a range of 4,000 to 10,000 lbs. for vessels using 2.5 to 5 inch square or diamond cod end mesh, and 2,000 to 6,000 lbs. for all other gears and cod end meshes. Table 66 summarizes the expected impacts on vessels using 2.5 to 4.5 inch mesh trawls based on reported landings during 2006-2010 and for the most recent fishing year (2010). Like the results for the northern

stock area, the more restrictive possession limits have greater impacts, reducing landings and catch, while increasing discards. Even at 10,000 lbs., the proposed possession limit would have affected 24 trips (0.3%), reducing landings by 10.0%, reducing catch by 6.0%, and increasing discards to 0.045 of landings. In 2010, a 4,000 lbs. possession limit would have affected only 6 trips and 1.0 percent of landings. Higher limits would affect no trips, but still may be effective in preventing vessels from targeting and catching large quantities of red hake in anticipation of landings triggering an incidental possession limit as an accountability measure.

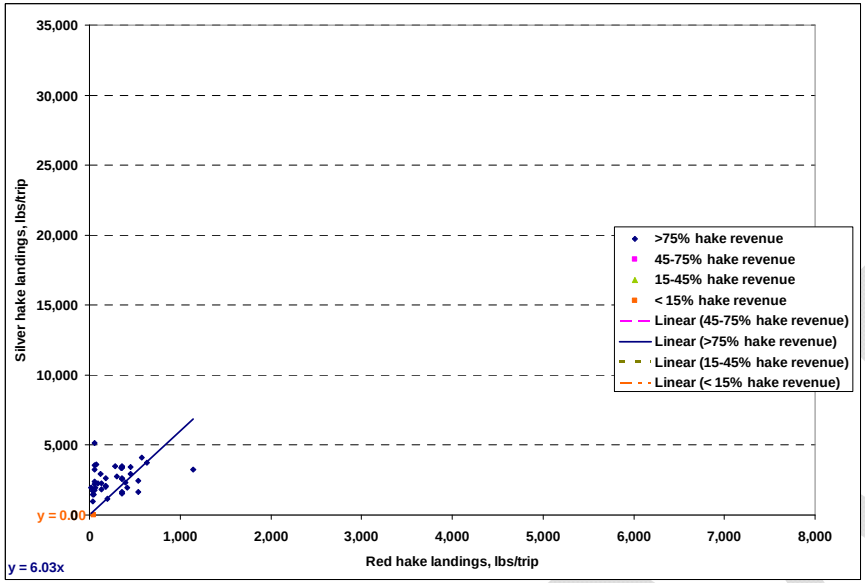
The expected impacts of the proposed possession limits for all other gears and meshes is summarized in Table 67. Limits at 4,000 lbs. and above would have had very little impact, but again may be effective at preventing increases in fishing effort targeting red hake. Over 2006-2010, a 2,000 lbs. possession limit would have affected 109 trips, reducing landings by 17.3% and catch by 9.5%. It would have affected nearly the same amount of trip in 2010, but fewer really high landings occurred then and the measure would have reduced landings by 8.6% and catch by 1.8%.

Conclusion

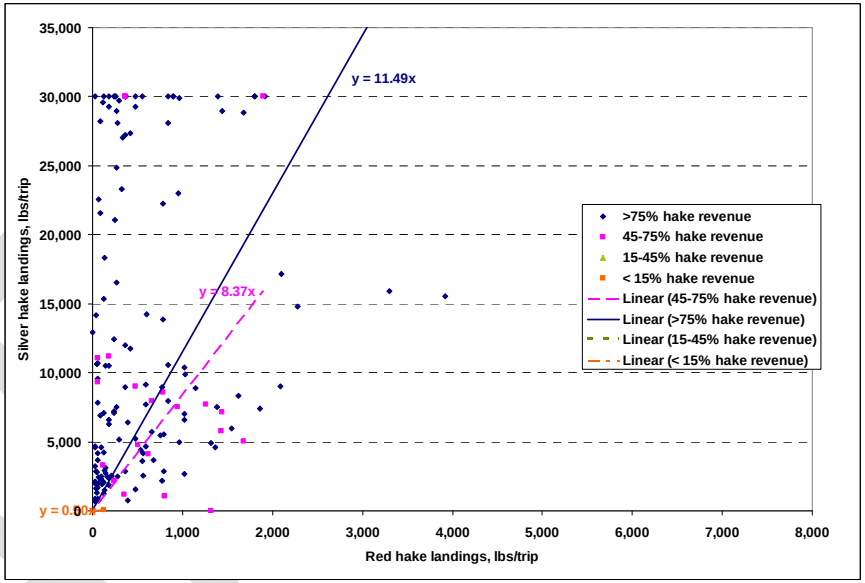
Except for the low end of the range, the proposed possession limits will have a marginal effect on fishing effort for red hakes, but could be very effective in preventing increases in fishing effort targeting red hake in anticipation of a directed fishery closure at the 90% TAL trigger. Allowing for higher limits for vessels using greater than 2.5 inch cod end mesh could improve selectivity based on general results for similar species, but the measure would be more effective in preventing vessels using mesh less than 2.5 inches from targeting red hake with that gear if red hake prices rise in anticipation of a directed fishery closure from the incidental possession limit.

Figure 20. Silver hake to red hake landings ratio by mesh in the northern stock area, 2008-2010. Each point represents landings on a specific day by a specific vessel using bottom trawls, summed over all dealers reporting landings. Source: NMFS SAFIS data.

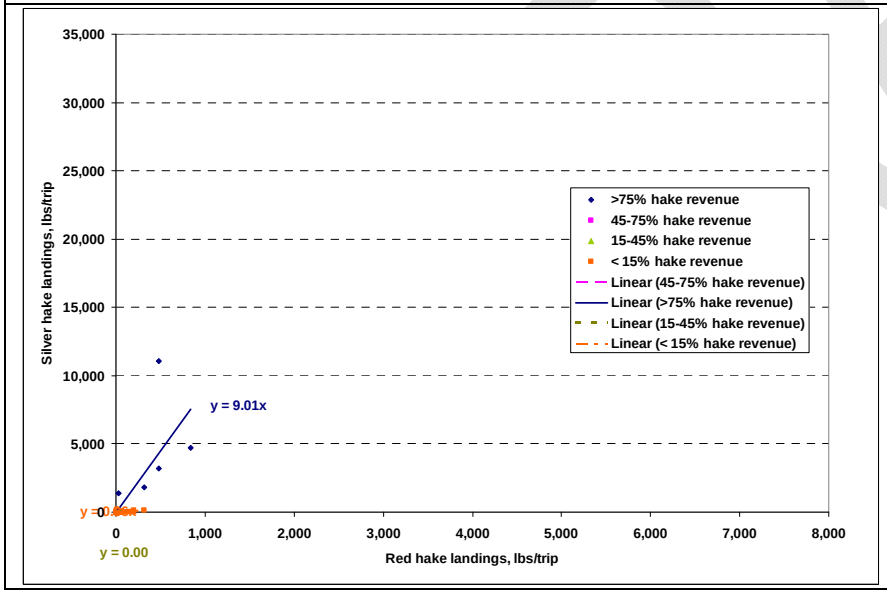
< 2.5" mesh



2.5-4.5" mesh



> 4.5" mesh



Unrecorded mesh

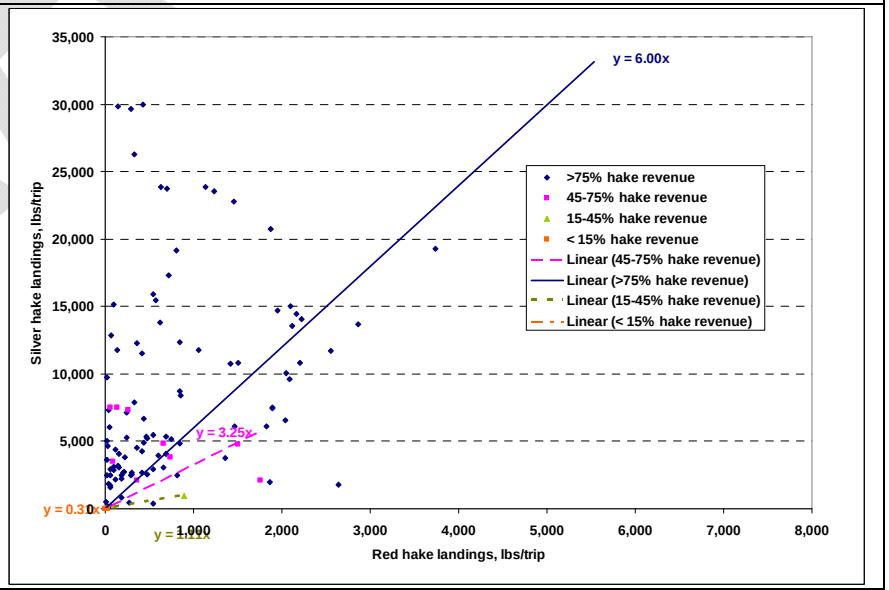
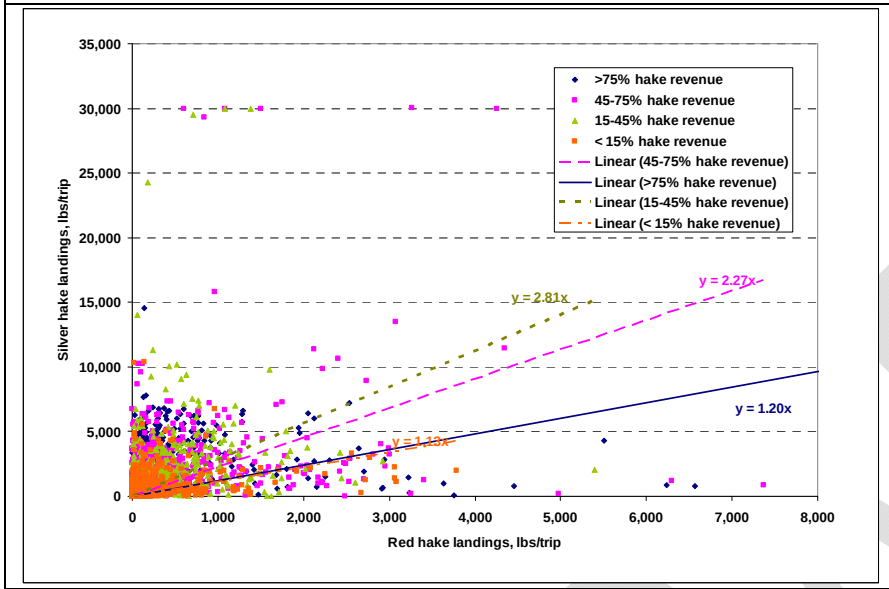
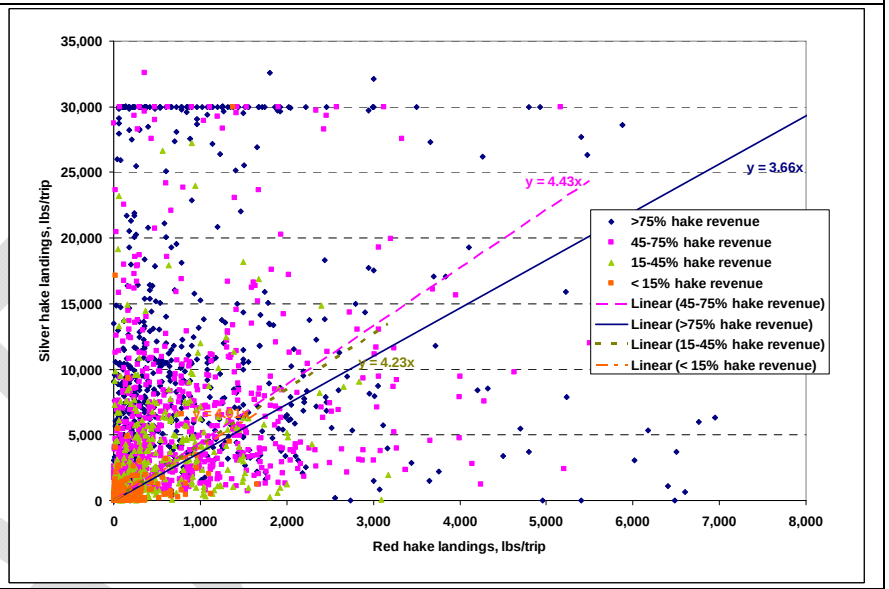


Figure 21. Silver hake to red hake landings ratio by mesh in the southern stock area, 2008-2010. Each point represents landings on a specific day by a specific vessel using bottom trawls, summed over all dealers reporting landings. Source: NMFS SAFIS data.

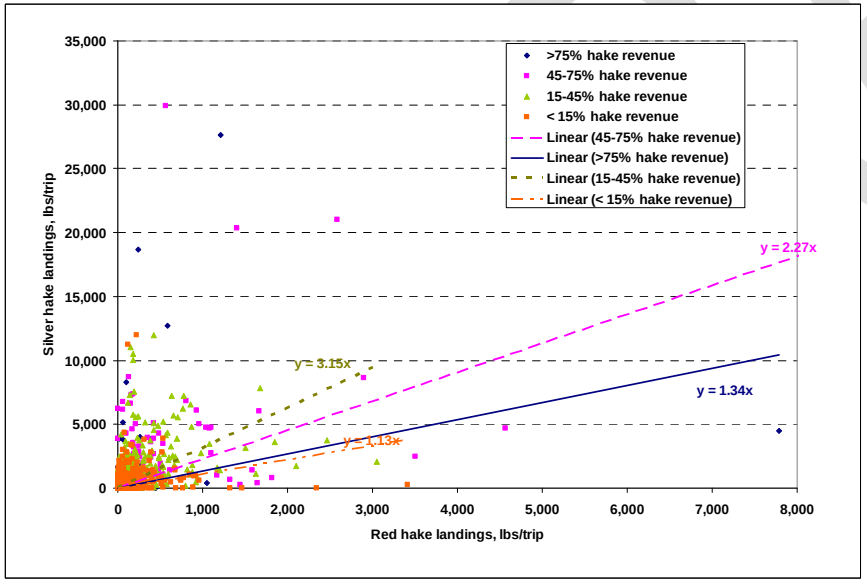
< 2.5" mesh



2.5-4.5" mesh



> 4.5" mesh



Unrecorded mesh

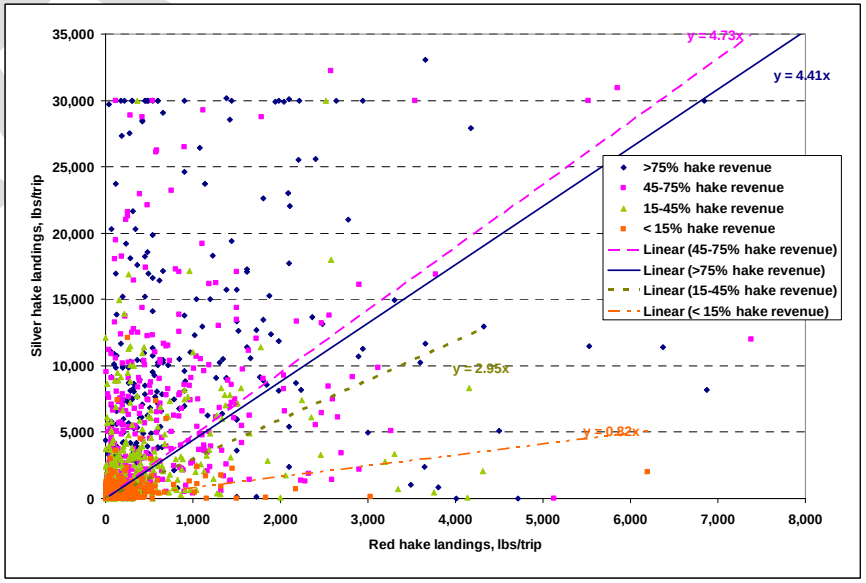


Table 64. Estimated effectiveness of year around red hake possession limits on trips in the northern stock area using trawls having 2.5 to 4.5 inch mesh during 2006-2010 fishing years (top) and during the 2010 fishing year (bottom).

Fishing year	2006-2010		
Incidental possession limit	1,000	2,000	3,000
Predicted landings reduction	-44.4%	-23.6%	-15.0%
Predicted red hake revenue reduction	-44.3%	-23.5%	-15.0%
Predicted catch reduction	-24.5%	-10.0%	-6.1%
Discard to kept ratio	35.8%	17.7%	10.5%
Proportion of trips affected	28.8%	12.1%	5.3%
Trips affected	126	53	23

Fishing year	2010		
Incidental possession limit	1,000	2,000	3,000
Predicted landings reduction	-24.6%	-4.7%	-1.2%
Predicted red hake revenue reduction	-24.9%	-4.7%	-1.2%
Predicted catch reduction	-7.9%	2.1%	0.9%
Discard to kept ratio	22.2%	7.1%	2.1%
Proportion of trips affected	18.6%	4.9%	1.1%
Trips affected	34	9	2

Table 65. Estimated effectiveness of year around red hake possession limits on trips in the northern stock area using trawls having less than 2.5 inch mesh or greater than 4.5 inch mesh during 2006-2010 fishing years.

Fishing year	2006-2010		
Incidental possession limit	300	750	1,200
Predicted landings reduction	-26.4%	-3.1%	0.0%
Predicted red hake revenue reduction	-25.5%	-2.9%	0.0%
Predicted catch reduction	-6.8%	0.9%	0.0%
Discard to kept ratio	26.5%	4.0%	0.0%
Proportion of trips affected	19.3%	1.8%	0.0%
Trips affected	22	2	0

Fishing year	2010		
Incidental possession limit	300	750	1,200
Predicted landings reduction	-2.6%	0.0%	0.0%
Predicted red hake revenue reduction	-2.1%	0.0%	0.0%
Predicted catch reduction	2.9%	0.0%	0.0%
Discard to kept ratio	5.6%	0.0%	0.0%
Proportion of trips affected	4.0%	0.0%	0.0%
Trips affected	1	0	0

Table 66. Estimated effectiveness of year around red hake possession limits on trips in the southern stock area using trawls having 2.5 to 4.5 inch mesh during 2006-2010 fishing years (top) and during the 2010 fishing year (bottom).

Fishing year	2006-2010		
Incidental possession limit	4,000	7,000	10,000
Predicted landings reduction	-17.3%	-12.4%	-10.0%
Predicted red hake revenue reduction	-18.0%	-13.0%	-10.5%
Predicted catch reduction	-9.5%	-7.4%	-6.0%
Discard to kept ratio	9.4%	5.7%	4.5%
Proportion of trips affected	1.5%	0.5%	0.3%
Trips affected	109	38	24

Fishing year	2010		
Incidental possession limit	4,000	7,000	10,000
Predicted landings reduction	-1.0%	0.0%	0.0%
Predicted red hake revenue reduction	-1.0%	0.0%	0.0%
Predicted catch reduction	0.5%	0.0%	0.0%
Discard to kept ratio	1.5%	0.0%	0.0%
Proportion of trips affected	0.4%	0.0%	0.0%
Trips affected	6	0	0

Table 67. Estimated effectiveness of year around red hake possession limits on trips in the southern stock area using trawls having less than 2.5 inch mesh or greater than 4.5 inch mesh during 2006-2010 fishing years.

Fishing year	2006-2010		
Incidental possession limit	2,000	4,000	6,000
Predicted landings reduction	-17.3%	-2.2%	-0.6%
Predicted red hake revenue reduction	-18.0%	-2.2%	-0.6%
Predicted catch reduction	-9.5%	0.0%	0.4%
Discard to kept ratio	9.4%	2.2%	1.0%
Proportion of trips affected	1.5%	0.3%	0.1%
Trips affected	109	19	7

Fishing year	2010		
Incidental possession limit	2,000	4,000	6,000
Predicted landings reduction	-8.6%	-4.7%	-1.2%
Predicted red hake revenue reduction	-8.6%	-4.5%	-1.1%
Predicted catch reduction	-1.8%	-0.4%	1.5%
Discard to kept ratio	7.5%	4.4%	2.7%
Proportion of trips affected	1.4%	0.6%	0.4%
Trips affected	101	7	4

8.1.1.5.2 Status quo/No Action (Section 5.7.3)

No Action would mean that trips in either the northern stock area, the southern stock area, or both have no red hake possession limit while landings are below the 90% TAL trigger. Thus, to the extent it occurs, no possession limit would allow vessels to target and catch more red hake if it appears that the incidental possession limit will take effect and it will not discourage vessels from using extra small mesh (< 2.5 inches) to target red hake if there is an advantage to doing so. Thus if there is any improvement in selectivity by using mesh greater than 2.5 inches, it would not be realized under the No Action alternative.

8.1.1.6 Post-Season Accountability Measure Alternatives

The reactive, or post-season, accountability measure alternative would implement a pound-for-pound payback of any ACL overage occurs in a given year.

8.1.1.6.1 Pound-for-Pound Payback of an ACL Overage (No Action; Section 5.9.1)

A reactive, pound-for-pound AM adjustment could have a positive impact on the small-mesh multispecies stocks because it would ensure that catch over the long-term does not exceed an acceptable level. This type of AM may also provide positive impact for a stock as an incentive for participants to fish within the given landings limit. By having a measure that could potentially reduce landings in a following year, fishery participants may be more likely to fish within the landing limits to ensure long-term access to a particular resource and assist in long-term business planning.

8.1.1.6.2 Reduce incidental possession limit trigger (Section 5.9.2)

A reactive AM could have a positive impact on the small-mesh multispecies stocks because it would ensure that catch over the long-term does not exceed an acceptable level. This type of AM may also provide positive impact for a stock as an incentive for participants to fish within the given landings limit. By having a measure that could potentially make in-season AMs more restrictive, fishery participants may be more likely to fish within the landing limits to ensure long-term access to a particular resource and assist in long-term business planning.

8.1.2 Impacts to Non-Target Species

As discussed in Section 4.2, the following species are likely impacted by the small-mesh multispecies fishery:

Table 68. Other species that may be impacted by the small-mesh multispecies fishery.

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
Loligo squid
Illex squid
Butterfish
Mackerel
Redfish

8.1.2.1 Northern and Southern Stock Area TAL and TAL Monitoring Alternatives

All of the species likely to be impacted by the small-mesh multispecies fishery (Table 68) are currently managed by either the New England or Mid-Atlantic Fishery Management Council under ACL

frameworks that would sufficiently limit the amount of redirected effort. Therefore, even though limiting catch on the small-mesh multispecies could result in a redirection of effort on to other species, the impact on non-target species, and their level of catch, are being managed by ABCs, ACLs, and AMs as well; thus, there would be neutral impacts on the non-target stocks from the small-mesh multispecies fishery implementing either of the TAL alternatives described above.

8.1.2.2 In-Season Accountability Measure Alternatives

8.1.2.2.1 Incidental Possession Limit Trigger (Section 5.4 and 5.6)

This alternative would reduce possession to an incidental limit when a trigger level is projected to be reached. Under this alternative, the incidental possession limit would remain in effect, even if the TAL is projected to be exceeded. This is intended to work in conjunction with the post-season accountability measure which would be invoked if the overage of the TAL causes the catch for that year to exceed the ACL. This alternative would have a neutral impact on non-target species because it would allow trips for other species to continue at approximately the same incidental level of small-mesh multispecies that are currently landed.

8.1.2.2.2 Status Quo/No Action (Section 5.4.4 and 5.6.3)

This alternative would result in no proactive, or in-season, AMs being implemented. This alternative would have neutral impacts on non-target species because it would allow trips for other species to continue at the same incidental level of small-mesh multispecies that are currently landed.

8.1.2.3 Post-Season Accountability Measure Alternatives

8.1.2.3.1 Pound-for-Pound Payback of an ACL Overage (Section 5.9.1)

A reactive AM is designed to respond to exceeding the ACL, and, if invoked, would prevent catches from exceeding the OFL in the future. This would likely lead to either no change in fishing (if the AM is not invoked), or a reduction in fishing effort (if the AM reduces the allowable landings) on small-mesh multispecies. The existence of such controls on small-mesh multispecies fishing effort will likely have neutral impacts for non-target species. As discussed above (Section **Error! Reference source not found.**), although a reduction in the amount of small-mesh multispecies that may be landed in a given year due to the implementation of a payback may result in redirected fishing into other fisheries, the programs that are in place for those other species should sufficiently manage that impact that a small increase in effort may have.

8.1.2.3.2 Status Quo/No Action (Section 5.9.1)

The status quo/no action would result in no AMs being implemented for the small-mesh multispecies fishery. This would likely result in no change to current fishing operations, especially because most of the non-target species described in Table 68 are currently managed under a system to protect those species, including catch limits and catch targets. Therefore, this alternative would have neutral impacts on non-target species.

8.1.3 Impacts to Protected Species

As described in Section 4.4, the following protected species may be impacted by the small-mesh multispecies fishery (Table 69):

Table 69. Protected species that may be impacted by the small-mesh multispecies fishery.

Cetaceans
North Atlantic right whale (*Eubalaena glacialis*)
Humpback whale (*Megaptera novaeangliae*)
Fin whale (*Balaenoptera physalus*)
Sei whale (*Balaenoptera borealis*)
Pilot whale (*Globicephala spp.*)
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)
Bottlenose dolphin (*Tursiops truncatus*)[b]
Sea Turtles
Leatherback sea turtle (*Dermochelys coriacea*)
Kemp's ridley sea turtle (*Lepidochelys kempii*)
Green sea turtle (*Chelonia mydas*)
Loggerhead sea turtle (*Caretta caretta*) Northwest Atlantic DPS
Fish
Cusk *(Brosme brosme)*
Atlantic sturgeon *(Acipenser oxyrinchus)*
Pinnipeds
Harbor seal (*Phoca vitulina*)
Harp seal (*Phoca groenlandicus*)

Although large whales and marine turtles may be potentially affected through interactions with fishing gear, it is likely that the continued authorization of the small-mesh multispecies fishery should not have any adverse effects on the availability of prey for these species. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The small-mesh multispecies fishery would not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that would pass through even small-mesh multispecies fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish (e.g., sand lance, herring, mackerel) (Aguilar 2002, Clapham 2002). Small-mesh multispecies fishing gear operates on or very near the bottom. Fish species caught in small-mesh multispecies gear are species that live in benthic habitat (on or very near the bottom) such as flounders versus schooling fish such as herring and mackerel that occur within the water column.

The alternatives under consideration in this action will not increase small-mesh multispecies fishing effort in either stock area, since they are administrative in nature, or otherwise do not affect the magnitude or distribution of fishing effort. Specifically, the alternatives under consideration which are not likely to affect small-mesh multispecies fishing effort, and by extension would not likely impact protected resources, include:

- Establishment of ABCs, ACLs, and TALs,
- Post-season accountability measures; and
- In-season accountability measures

The continued authorization of the small-mesh multispecies fishery should likely not affect the availability of prey for foraging humpback or fin whales. Moreover, none of the turtle species are known to feed upon small-mesh multispecies fishery stocks. In summary, the actions proposed in this amendment would have neutral impacts on protected species in the region.

8.1.3.1 Impacts to Atlantic Sturgeon

To be determined; pending formal completion to listing request.

8.2 Impacts to the Physical Environment

To be completed ???

8.3 Impacts on Stellwagen Bank National Marine Sanctuary (SBNMS)

To be completed ???

8.4 Essential Fish Habitat (EFH) impacts

The overall effect of the fishery on EFH was analyzed and mitigated for in Amendment 13 to the Northeast Multispecies FMP. The small-mesh multispecies fishery is primarily a trawl fishery, with minor landings coming from sink gillnets and other gears (Section 4.3; Table 39). In the northern stock areas, a raised footrope trawl is required in several of the exempted fishing programs (the Gulf of Maine Raised Footrope Trawl, Small Mesh Areas I and II, and the Raised Footrope Exemption Areas near Cape Cod). The raised footrope trawl has less impact on habitat than a traditional otter trawl (see Section 4.3.3 for more information). Small-mesh multispecies fishing effort will continue to occur in areas that are open to mobile bottom-tending gears or by gears that have been determined to not adversely impact EFH in a manner that is more than minimal and less than temporary in nature.

The alternatives under consideration in this action will not increase small-mesh multispecies fishing effort in either stock area, since they are administrative in nature, or otherwise do not affect the magnitude or distribution of fishing effort. Specifically, the alternatives under consideration which are not likely to affect small-mesh multispecies fishing effort, and by extension would not likely impact EFH, include:

- Establishment of ABCs, ACLs, and TALs,
- Post-season accountability measures; and
- In-season accountability measures

The small-mesh multispecies fishery is moving from a system with no catch limits, to a system with catch limits. While the catch limits are, in most cases, substantially higher than recent catch, there was previously no limit. Therefore, it is likely that catch, and by extension, fishing effort, would not change due to the implementation of these measures. The only stock where recent (2010) catch is higher than the proposed ACL is northern red hake. In this case, the preferred alternatives may have a slightly positive impact on the physical environment and EFH, if there is less fishing in a given fishing year, as compared to 2010 (Table 70).

Table 70. Percent difference between proposed ACLs and 2010 catch.

	Northern Red Hake	Northern Silver Hake	Southern Red Hake	Southern Whiting
Proposed ACL	266 mt	12,518 mt	3,096 mt	32,243 mt
2010 Catch	311 mt	2,478 mt	1,352 mt	7,110 mt
% Difference	-15%	405%	129%	354%

In summary, the actions proposed in this amendment would have neutral impacts on EFH for any federally managed species in the region.

8.5 Impacts to Human Communities

8.5.1 ABC, ACL, and TAL Alternatives

8.5.1.1 Stock Area ABC, ACLs, and TALs, including a Specifications Process (Sections 4.1 and 5.2)

This alternative would implement an ABC, an ACL, and a TAL framework, including the specifications process, for each of the following stocks/stock group: Northern red hake, northern silver hake, southern red hake, and southern whiting (southern silver hake and offshore hake combined). It is likely that implementing the stock area catch and landings limits framework and specifications process, as described in Sections 3.1 and 3.2, would have neutral to positive economic impacts.

The ACLs and TALs for the stocks are greater than recent catches and landings, respectively, with the exception of northern red hake. It can be assumed that landings, as well as fishing effort would not change substantially due to this alternative. However, if there were changes, there would most likely be positive economic impacts to fishing communities because the TALs and ACLs are greater than previous years' landings. The proposed ACL for northern red hake is less than the catch in 2010; however, the proposed TAL is greater than 2010 landings of northern red hake. It is likely that there would also be a neutral to positive economic impact to those vessels targeting northern red hake. This alternative would likely result in no change to current fishing operations; however, the sustainable harvesting of the small-mesh multispecies stocks would lead to positive long-term benefits.

Based upon the average prices from 2005-2010 and the proposed Federal TAL, the estimated gross revenue would be greater than the average gross revenues earned from 2005-2010 for each of the species/stock areas (Table 71).

Table 71. Average landings and revenue for the species/stock areas, along with the proposed Federal TAL and estimated gross revenues (based upon average prices).

	Average Landings 2005-2010	Average Revenue 2005-2010	Proposed Federal TAL	Estimated Gross Revenue
Northern Red Hake	107,157 lb	$ 43,762	238,099 lb	$ 144,288
Southern Red Hake	485 lb	$ 414,250	2,383,197 lb	$ 1,086,738
Northern Silver Hake	2,238,561 lb	$ 1,305,332	20,075,292 lb	$ 19,473,033
Southern Whiting	15,475,112 lb	$ 8,827,030	59,709,995 lb	$ 50,454,946

8.5.1.2 Status Quo/No Action (Section Error! Reference source not found.)

The status quo/no action alternative would maintain the current management measures for the small-mesh multispecies fishery. There would be no ABCs, ACLs, or TALs adopted for this fishery. This alternative would most likely result in neutral economic impacts to fishing communities because there would be no impact on overall fishing effort and by extension revenue.

8.5.2 Post-Season Accountability Measure Alternatives

The reactive, or post-season, accountability measure would implement a pound-for-pound payback of any ACL overage in a subsequent year.

8.5.2.1 Pound-for-Pound Payback of an ACL Overage (Section 5.9.1)

A reactive accountability measure is designed to respond to exceeding the ACL, and, if invoked, would prevent catches from exceeding the OFL in the future. This would likely lead to either no change in fishing (if the accountability measure is not invoked), or a reduction in fishing effort (if the accountability measure reduces the allowable landings). By allowing the overage to be deducted from future years this would give vessel owners an opportunity to adopt alternative fishing strategies to account for a pound-for-pound payback due to an ACL overage. If this alternative is invoked, it would result in short-term negative economic impacts by reducing the amount of a particular stock that could be landed in a given year.

8.5.2.2 Status Quo/No Action (Section ???)

Not implementing a reactive accountability measure would have a neutral impact to vessels targeting small-mesh multispecies stocks because there is no change from the current management. It is possible, however, that by exceeding the ACL on a regular basis, long-term impacts on the stock could lead to long-term economic losses due to changes in the stock size.

8.5.3 In-Season Accountability Measure Alternatives

In-season accountability measures grant the Northeast Regional Administrator the authority to implement a management measure, such as reducing the trip limit or closing the fishery, when landings are projected to reach a pre-determined level.

8.5.3.1 Incidental Possession Limit Trigger (Sections 5.4 and 5.6)

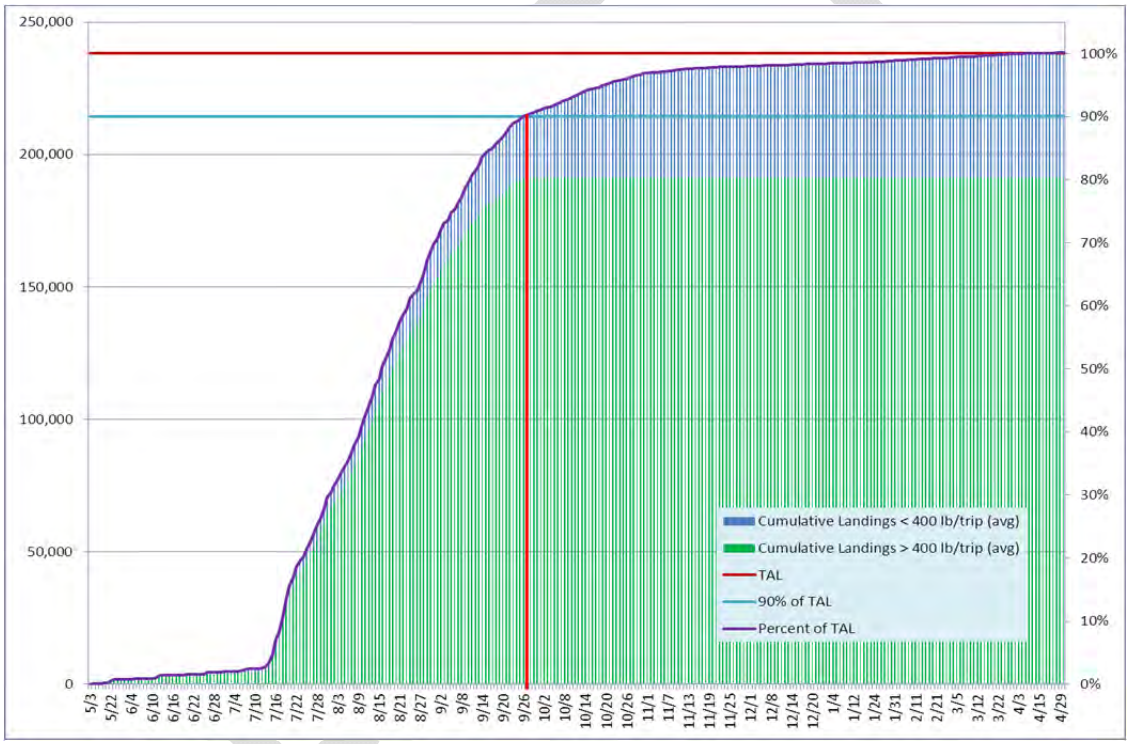
This alternative would reduce possession to an incidental limit when a trigger level is projected to be reached. Under this alternative, the incidental possession limit would remain in effect, even if the TAL is projected to be exceeded. This is intended to work in conjunction with the post-season accountability measure which would be invoked if the overage of the TAL causes the catch for that year to exceed the ACL.

Northern red hake is likely the only stock where an AM might be triggered in the near future. Table 70 illustrates the percent difference between the proposed ACLs and recent catch. In most cases, it is significantly higher than recent catch, and therefore unlikely that an AM might be triggered.

In the figure below (Figure 22), the proposed TAL and 90 percent of the proposed TAL are plotted with the 2006 – 2010 average daily landings of northern red hake, as reported through vessel trip reports. This

graph demonstrates the effect of implementing a 400 lb incidental possession limit for northern red hake. Based on vessel trip reported landings, including bait landings, the 90-percent trigger would be reached in late September. Assuming that, because red hake is rarely, if ever, the target species, all the trips would still occur, those trips that landed less than or equal to 400 lb (blue) would remain unaffected. Those trips that previously landed more than 400 lb (green) after September 26 would presume to continue, but would be capped at 400 lb. The trips that would be affected by a 400 lb possession limit represent approximately 5-percent of the trips that landed red hake from 2006-2010. These trips were taken by 30 different vessels over that time, with an average of seven vessels per year. The 400 lb incidental limit would affect, on average, 3.5 trips per vessel, over the 2006-2010 timeframe. However, in recent years, it may affect a fewer number of vessels, but a higher number of trips per vessel. At the average price of $0.37 per pound of red hake, this would result in approximately $282 lost revenue per trip for the 23 average trips per year, or a total loss across the fleet of $6,486. This may have a low negative impact on fishing communities; however, as red hake is not commonly the target species, vessels may shift effort to another incidental species such as skates or dogfish.

Figure 22 Northern red hake average landings per month (2006-2010) with proposed TAL and trigger.



8.5.3.2 Incidental Possession Limit Trigger for Small Mesh Area Programs

To be completed by PDT economist ???

8.5.3.3 Quarterly TAL Triggers in the Southern Stock Area

To be completed by PDT economist ???

8.5.3.4 Status Quo/No Action (Section Error! Reference source not found. and Error! Reference source not found.)

This alternative would result in no proactive, or in-season, accountability measures being implemented. Not implementing a proactive accountability measure would have a neutral impact to vessels targeting small-mesh multispecies stocks because there is no change from the current management. It is possible, however, that by exceeding the recommended landing level on a regular basis, long-term impacts on the stock could lead to long-term economic losses due to changes in the stock size.

8.5.3.5 Year around possession limits

To be completed by PDT economist ???

8.5.3.5.1 Red hake possession limits (Sections ???)

8.5.3.5.2 Status quo/No Action (Section ???)

8.5.3.6 Reporting and monitoring requirements

To be completed by PDT economist ???

8.5.3.6.1 Weekly VTR reports

8.5.3.6.2 No Action/ Status Quo

8.6 Cumulative Effects

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of a cumulative effects analysis 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 addresses the significance of the expected cumulative impacts as they relate to the federally managed small-mesh multispecies fishery.

8.6.1.1 Consideration of the Valued Ecosystem Components (VECs)

In Section 7.0 (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. Managed resources (offshore hake, red hake, and silver hake)
2. Non-target species
3. Habitat including EFH for the managed resource and non-target species
4. ESA-listed and MMPA-protected species
5. Human communities

8.6.1.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of the small-mesh multispecies (offshore hake, red hake, and silver hake). The core geographic scope for each of the VECs is focused on the Western Atlantic Ocean (Section 7.0). The core geographic scopes for the managed resources are the range of the Mid-Atlantic Bight, the Gulf of Maine, and Georges Bank. 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 small-mesh multispecies and other non-target species in the Western Atlantic Ocean. The core geographic scope for endangered and protected resources can be considered the overall range of these VECs in the Western Atlantic Ocean. For human 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 7.2).

8.6.1.3 Temporal Boundaries

The temporal scope of past and present actions for VECs is primarily focused on actions that have occurred after FMP implementation (1991, Amendment 4 to the Northeast Multispecies FMP for red and silver hake; and 2000, Amendment 12 to the Northeast Multispecies FMP for offshore hake). For endangered species and other protected resources, the scope of past and present actions is on a species-by-species basis (Section 7.1.4) 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.

Amendment 19 will replace the secretarial action and the specifications in this action would continue until re-evaluated. This action includes a three-year specification process that will begin in 2014 for implementation on May 1, 2015. During this process, the Council will update relevant data on biological and fishery characteristics. This process will enable the Council to adjust the plan in response to changing conditions. If for some reason, the Council and NMFS are unable to modify the specifications, the proposed specifications will continue until changed.

The Council chose a three year specification period because a shorter period would create greater instability in the fishery, reducing potential revenue to the fishery and increasing the risk that changes may occur. This would make it more difficult for participants in the fishery to plan, invest, or obtain financing. A longer period, on the other hand, would make the plan less responsive to important changes in resource conditions, increasing the risk to the resource.

8.6.1.4 Actions Other Than Those Proposed in this Amendment

The impacts of each of the alternatives considered in this document are given in Section 7.1. Table 72 presents meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions to be considered other than those actions being considered in this amendment 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.

8.6.1.4.1 Past, Present, and Reasonably Foreseeable Future Actions

8.6.1.4.2 Fishery related actions

The historical management practices of the Council have resulted in positive impacts on the health of the small-mesh multispecies stocks. Numerous actions have been taken to manage the fisheries for these three species through amendment and framework adjustment actions. In addition, the nature of the fishery management 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 Magnuson-Stevens Act. 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, which should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the small-mesh multispecies stocks. There are two amendments currently under development by the Council that will impact the small-mesh multispecies fishery. The Council is developing Amendment 19 that will update the ACL and AM framework that is being proposed in this action. The other amendment under development is an update to the Omnibus Essential Fish Habitat Amendment that is intended to revise the existing EFH descriptions and habitat protection areas. Given the nature of the Omnibus EFH Amendment and Amendment 19, it is likely that these actions would have positive biological impacts; however, full analyses of these actions has not yet been completed.

8.6.1.4.3 Non-fishing actions

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 nearshore 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 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 Magnuson-Stevens Act, 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 river and marine habitats.

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 Magnuson-Stevens Act (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.

8.6.1.5 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.

Table 72. Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this proposed action).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFF Original FMP and subsequent Amendments to the Small-Mesh Multispecies FMP, including Amendment 19	Established 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 Developed and Applied Standardized Bycatch Reporting Methodology (SBRM) through Northeast Region SBRM Omnibus Amendment	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 overall and will not affect distribution of effort	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
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 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
P, Pr, RFF Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases	**Indirect Negative** Localized decreases	**Direct Negative** Reduced habitat	**Indirect Negative** Localized	**Mixed** Positive for mining

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
		in habitat quality	in habitat quality	quality	decreases in habitat quality	companies, possibly negative for fishing industry
	Placement of sand to nourish beach shorelines	**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	**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
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
RFF Offshore Wind Energy Facilities	Construction of wind turbines to harness electrical power (Several proposed from ME through NC)	**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	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 Gear Take Reduction Teams	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

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
RFF Omnibus EFH Amendment	Reviewing and updating a gear effects evaluation and optimizing management measures for minimizing the adverse effects of fishing on EFH	**Indirect Positive** Will improve habitat protection, which is necessary for sustainable fish stocks	**Indirect Positive** Will improve habitat protection, which is necessary for sustainable fish stocks	**Positive** Will improve habitat protection	**Uncertain - Neutral to Indirect Negative** May result in redistribution of effort to areas of increased protected resources stocks	**Indirect Positive** Improved habitat protection will result sustainable fish stocks and long-term economic stability

8.6.2 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.

8.6.2.1 Managed Resources

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 72. The indirectly negative actions described in Table 72 are localized in nearshore 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 6.4), 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.

Past fishery management actions taken through the FMP have had a positive cumulative effect on the managed resources. It is anticipated that the future management actions, described in Table 73, 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 offshore hake, red hake, and silver hake productivity depends. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to the small-mesh multispecies resources have had a positive cumulative effect.

Table 73 Summary of the effects of past, present, and reasonably foreseeable future actions on the managed resources.

Action	**Past to the Present**		**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
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**		
Offshore Wind Energy Facilities			**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals		**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams			**Indirect Positive**
Omnibus EFH Amendment			**Indirect Positive**
Amendment 19 (Council's ACL and AM Amendment)			**Uncertain – Likely Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, positive impacts on the managed resources** *** See section 6.6 for explanation.**		

8.6.2.2 Non-Target Species or Bycatch

Those past, present, and reasonably foreseeable future actions, whose effects may impact non-target species and the direction of those potential impacts, are summarized in Table 72. The effects of indirectly negative actions described in Table 72 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on non-target species 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 6.4), 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 (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 have had a positive cumulative effect on non-target species. Implementation and application of a standardized bycatch reporting methodology 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. Better assessment of potential bycatch issues allows more effective and specific management measures to be developed to address a bycatch problem. It is anticipated that future management actions, described in Table 74, 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.

Table 74 Summary of the effects of past, present, and reasonably foreseeable future actions on the non-target species.

Action	**Past to the Present**		**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
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**		
Offshore Wind Energy Facilities			**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals		**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams			**Indirect Positive**
Omnibus EFH Amendment			**Indirect Positive**
Amendment 19 (Council's ACL and AM amendment)			**Uncertain – Likely Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, positive impacts on the non-target species** *** See section 6.6 for explanation.**		

8.6.2.3 Habitat (Including EFH)

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 72. The direct and indirect negative actions described in Table 72 are localized in nearshore 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 6.4), 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.

Past fishery management actions taken through the FMP process have had a positive cumulative effect on habitat and EFH. As required under these FMP actions, EFH and HAPCs will be redefined for the managed resources. It is anticipated that the future management actions, described in Table 75, 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.

Table 75 Summary of the effects of past, present, and reasonably foreseeable future actions on the habitat.

Action	**Past to the Present**		**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
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**		
Offshore Wind Energy Facilities			**Potentially Direct Negative**
Liquefied Natural Gas (LNG) terminals		**Potentially Direct Negative**	
Convening Gear Take Reduction Teams			**Indirect Positive**
Omnibus EFH Amendment			**Positive**
Amendment 19 (Council's ACL and AM amendment)			**Uncertain – Likely Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, neutral to positive impacts on habitat, including EFH * See section 6.6 for explanation.**		

8.6.2.4 ESA-Listed and MMPA-Protected Species

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 72. The indirectly negative actions described in Table 72 are localized in nearshore 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 6.4), 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 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 requirements. It is anticipated that the future management actions, described in Table 76, will result in additional indirect positive effects on 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.

Table 76 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 to the FMP	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
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**		
Offshore Wind Energy Facilities			**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals		**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams			**Indirect Positive**
Omnibus EFH Amendment			**Uncertain - Neutral to Indirect Negative**
Amendment 19 (Council's ACL and AM amendment)			**Uncertain – Likely Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, positive impacts on protected resources** *** See section 6.6 for explanation.**		

8.6.2.5 Human 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 72. The indirectly negative actions described in Table 72 are localized in nearshore 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 6.4), 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.

Past fishery management actions taken through the FMP 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 Table 77, will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on the human 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 human communities have had an overall positive cumulative effect.

Despite the potential for slight negative short-term effects on human communities, the expectation is that there would be a positive long-term effect on human communities due to the long-term sustainability of offshore hake, red hake, and silver hake. Overall, the proposed actions in this document would not change the past and anticipated cumulative effects on human communities and thus, would not have any significant effect on human communities individually, or in conjunction with other anthropogenic activities (Table 77).

Table 77 Summary of the effects of past, present, and reasonably foreseeable future actions on human communities.

Action	**Past to the Present**		**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments to the FMP	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Potentially Indirect Negative**		
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**		
Offshore Wind Energy Facilities			**Uncertain – Likely Mixed**
Liquefied Natural Gas (LNG) terminals		**Uncertain – Likely Mixed**	
Convening Gear Take Reduction Teams			**Indirect Negative**
Omnibus EFH Amendment			**Indirect Positive**
Amendment 19 (Council's ACL and AM amendment)			**Uncertain – Likely Positive**
Summary of past, present, and future actions excluding those proposed in this document	**Overall, actions have had, or will have, positive impacts on human communities** *** See section 6.6 for explanation.**		

8.6.3 Preferred Action on all the VECS

The Council has identified its preferred action alternatives in section 3.0. 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 action.

Table 78 Magnitude and significance of the cumulative effects; the additive and synergistic effects of the preferred action, as well as past, present, and future actions.

VEC	Status in 2011	Net Impact of P, Pr, and RFF Actions	Impact of the Preferred Action	Significant Cumulative Effects
Managed Resources	Complex and variable (Section 4.1)	Positive (Sections 6.4 and 6.5.1)	Neutral to positive (Section 5.1)	**None**
Non-target Species	Complex and variable (Section 4.2)	Positive (Sections 6.4 and 6.5.2)	Neutral (Section 5.2)	**None**
Habitat	Complex and variable (Section 4.3)	Neutral to positive (Sections 6.4 and 6.5.3)	Neutral to low positive (Section 5.3)	**None**
Protected Resources	Complex and variable (Section 4.4)	Positive (Sections 6.4 and 6.5.4)	Neutral (Section 5.4)	**None**
Human Communities	Complex and variable (Section 4.5)	Positive (Sections 6.4 and 6.5.5)	Short-term negative to long-term positive (Section 5.5)	**None**

The 2012 fishing year will be the first year of implementation for the required specification of ACLs and accountability measures. This represents a major change to the current management program and is expected to lead to improvements in resource sustainability over the long-term. Direct and indirect impacts of these measures could be broad in scope and are further discussed in section 5.1 through section 5.5. The magnitude and significance of the cumulative effects, which include the additive and synergistic effects of the proposed action, as well as past, present, and future actions, have been taken into account throughout this Section 6.0. The action proposed in this Secretarial amendment builds off action taken in the original FMP and subsequent amendments.

The proposed action in this document would positively reinforce the past and anticipated positive cumulative effects on the managed resources, 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 (Table 73).

The proposed action in this document has neutral impacts to non-target species and would not change the past and anticipated positive cumulative effects on non-target species. Thus, the proposed action would not have any significant effect on these species individually or in conjunction with other anthropogenic activities (Table 74).

The proposed action 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 (Table 75).

The proposed action 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 76).

The proposed action in the document may have short-term negative to long-term positive impacts on human communities. However, such anticipated impacts would not significantly change the past and anticipated cumulative effects on revenues and the social well-being of fishermen and/or associated businesses individually or in conjunction with other anthropogenic activities (Table 77).

Therefore, 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 action proposed in this document (Table 78).

9.0 COMPLIANCE WITH OTHER APPLICABLE LAW

9.1 National Environmental Policy Act (NEPA)

9.1.1 Finding of No Significant Impact (FONSI)

To be completed in Final Amendment.

9.1.2 List of preparers; point of contact

The information contained in this document was prepared through the cooperative efforts of the Whiting Plan Development Team members, and other members of the staffs of NMFS and the New England Fishery Management Council. Contributors are:

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9.1.3 Agencies consulted

This proposed action was developed by the New England Fishery Management Council in coordination with the National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council.

9.1.4 Opportunity for public comment

The proposed action in this specifications document was prepared by the New England Fishery Management Council during a series of public meetings, including SSC and Whiting Oversight Committee meetings, a Council meeting on June 19-21 2011, and a review of the final proposed specifications at the Sep 26-29, 2011. NMFS will publish the new specifications as a proposed rule following submission of this document to the Secretary of Commerce, which will provide an additional opportunity for public comment.

9.2 Endangered Species Act (ESA)

To be completed in Final Amendment.

9.3 Marine Mammal Protection Act (MMPA)

To be completed in Final Amendment.

9.4 Coastal Zone Management Act (CZMA)

To be completed in Final Amendment.

9.5 Administrative Procedure Act

To be completed in Final Amendment.

9.6 Executive Order 13132 (Federalism)

To be completed in Final Amendment.

9.7 Initial Regulatory Flexibility Analysis (IRFA) – Determination of Significance

To be completed in Final Amendment.

9.8 Executive Order 13158 (Marine Protected Areas)

To be completed in Final Amendment.

9.9 Paperwork Reduction Act

To be completed in Final Amendment.

9.10 Executive Order 12866

To be completed in Final Amendment.

9.11 Information Quality Act (IQA)

To be completed in Final Amendment.

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