Draft Framework Adjustment 53
To the Northeast Multispecies FMP

Prepared by the
New England Fishery Management Council
In consultation with the
Mid-Atlantic Fishery Management Council
National Marine Fisheries Service

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Final Framework Meeting:
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1.0 Executive Summary

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the Magnuson-Stevens Act (M-S Act). The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, Atlantic wolffish, and ocean pout) off the New England and Mid-Atlantic coasts. The FMPs have been updated through a series of amendments and framework adjustments. Amendment 16, which became effective on May 1, 2010, was the most recent amendment to adopt a broad suite of management measures in order to achieve the fishing mortality targets necessary to rebuild overfished stocks and meet other requirements of the M-S Act. Amendment 17 is the most recent amendment but addresses state-operated permit banks. Eight framework adjustments have updated the measures in Amendment 16.

Amendment 16 made major changes to the FMP. The Amendment adopted a system of Annual Catch Limits (ACLs) and Accountability Measure (AMs) that are designed to ensure catches remain below desired targets for each stock in the management complex. The National Standard Guidelines provide advisory guidance (that does not have the effect or force of law) for the implementation of these requirements (50CFR 600.310(g)). AMs are management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur. AMs should address and minimize both the frequency and magnitude of overages and correct the problems that caused the overages in as short a time as possible. AMs can be either in season AMs or AMs for when the ACL is exceeded.

NMFS acknowledged in the publication of the guidelines that there is no requirement that AMs and ACLs be implemented as hard TACs or quotas, but conservation and management measures must be implemented so that the ACL is not exceeded and AMs must apply if the ACL is exceeded (74 FR 3184). While many measures in the management program are intended to control fishing mortality and might be interpreted to be AMs since they are "management controls to prevent the ACL from being exceeded," the term AM is usually applied to specific, automatic measures that are implemented either as an ACL is approached or after an ACL is exceeded.

This framework (Framework Adjustment 53, FW53) is intended to incorporate any status changes for groundfish stocks, set specifications for several groundfish stocks, and adjust management measures for commercial and recreational fisheries that catch groundfish stocks.

The *need* for this action is to meet regulatory requirements and adjust management measures that are necessary to prevent overfishing, ensure rebuilding, and help achieve optimum yield in the fishery consistent with the status of stocks and the requirements of MSA of 2006. The *purpose* is to XXX.

Proposed Action

Under the provision of the M-S Act, the Council submits proposed management actions to the Secretary of Commerce for review. The Secretary of Commerce can approve, disapprove, or partially approve the action proposed by the Council. ~~In the following alternative descriptions, measures identified as Preferred Alternatives constitute the Council's preferred management action.~~

~~If the Preferred Alternatives identified in this document are adopted, this action would implement measure to XXX. Details of the measure summarized below can be found in Section 4.0.~~

~~The Preferred Alternatives include:~~

- *Stock Status Changes and Annual Catch Limits*
  - *XXX*
  - *XXX*
- *Commercial and Recreational Fishery Measures.* ~~These measures, based on the Preferred Alternatives, would affect commercial fishing.~~
  - *XXX*
  - *XXX*

Summary of Environmental Consequences

The environmental impacts of all of the alternatives under consideration are described in Section 7.0. Biological impacts are described in Section 7.1; impacts on essential fish habitat are described in Section 7.2; impacts on endangered and other protected species are described in Section 7.3; the economic impacts are described in Section 7.4; and the social impacts are described in Section 7.5. ~~Cumulative effects are described in Section 7.6. Summaries of the impacts are provided in the following paragraphs.~~ As required by NEPA, the Preferred Alternatives are compared to the No Action alternative.-Throughout the document, more informative comparisons are also made between the Preferred Alternatives and the current situation in FY 2014 as appropriate.

Biological Impacts
The Preferred Alternatives are designed to XXX.

Essential Fish Habitat (EFH) Impacts
The Preferred Alternatives would….

Impacts on Endangered and Other Protected Species
The Preferred Alternatives would….

Economic Impacts
The Preferred Alternatives would …..

Social Impacts
The Preferred Alternatives would ….

Alternatives to the Proposed Action

~~There are a number of alternatives that would not be adopted. These include the No Action alternative and Option 4, which was not identified as a preferred alternative. Both alternatives are briefly described below.~~

- *Stock Status Changes and Annual Catch Limits*
  - *XXX*
  - *XXX*
- *Commercial and Recreational Fishery Measures.*
  - *XXX*
  - *XXX*

Impacts of Alternatives to the Proposed Action

~~The No Action alternative would not address the goals of the M-S Act as well as the preferred alternatives because it would not XXX. Only the most significant impacts are highlighted below.~~

Biological Impacts
Because the No Action alternative would ….

Essential Fish Habitat
Because the No Action alternative would …

Impacts on Endangered and Other Protected Species
The No Action alternative and would ….

Economic Impacts
The No Action Alternative would …..

Social Impacts
Because the No Action alternative would ….

2.0 Contents

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ABC	Acceptable Biological Catch
ACE	Annual Catch Entitlement
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
APA	Administrative Procedures Act
ASAP	Age-structured assessment program; assessment model
ASM	At-sea monitoring
ASMFC	Atlantic States Marine Fisheries Commission
B	Biomass
CAA	Catch at Age
CAI	Closed Area I
CAII	Closed Area II
CC	Cape Cod
CEQ	Council on Environmental Quality
CHOIR	Coalition for the Atlantic Herring Fishery's Orderly, Informed, and Responsible Long-Term Development
CPUE	Catch per unit of effort
CZMA	Coastal Zone Management Act
DAH	Domestic Annual Harvest
DAM	Dynamic Area Management
DAP	Domestic Annual Processing
DAS	Days-at-sea
DEA	Data Envelopment Analysis
DFO	Department of Fisheries and Oceans (Canada)
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DSEIS	Draft Supplemental Environmental Impact Statement
DSM	Dockside monitoring
DWF	Distant-Water Fleets
E.O.	Executive Order
EA	Environmental Assessment
ECPA	East Coast Pelagic Association
ECTA	East Coast Tuna Association
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ETA	Elephant Trunk Area
F	Fishing mortality rate
FAAS	Flexible Area Action System
FEIS	Final Environmental Impact Statement
FMP	Fishery Management Plan
FSCS	Fisheries Scientific Computer System
FSEIS	Final Supplemental Environmental Impact Statement
FW	Framework
FY	Fishing year
GAMS	General Algebraic Modeling System

GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GEA	Gear Effects Evaluation
GIFA	Governing International Fisheries Agreement
GIS	Geographic Information System
GARFO	Greater Atlantic Regional Fisheries Office
GMRI	Gulf of Maine Research Institute
GOM	Gulf of Maine
GRT	Gross registered tons/tonnage
HAPC	Habitat area of particular concern
HCA	Habitat Closed Area
HPTRP	Harbor Porpoise Take Reduction Plan
I/O	Input/output
ICNAF	International Commission for the Northwest Atlantic Fisheries
IFQ	Individual fishing quota
IOY	Initial Optimal Yield
IRFA	Initial Regulatory Flexibility Analysis
ITQ	Individual transferable quota
IVR	Interactive voice response reporting system
IWC	International Whaling Commission
IWP	Internal Waters Processing
JVP	Joint Venture Processing
LISA	Local Indicator of Spatial Association
LOA	Letter of authorization
LPUE	Landings per unit of effort
LWTRP	Large Whale Take Reduction Plan
M	Natural Mortality Rate
MA	Mid-Atlantic
MA DMF	Massachusetts Division of Marine Fisheries
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MARFIN	Marine Fisheries Initiative
ME DMR	Maine Department of Marine Resources
MEY	Maximum economic yield
MMC	Multispecies Monitoring Committee
MMPA	Marine Mammal Protection Act
MPA	Marine protected area
MRFSS	Marine Recreational Fishery Statistics Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum sustainable yield
MWT	Midwater trawl; includes paired mid-water trawl when referring to fishing activity or vessels in this document
mt	Metric tons
NAO	North Atlantic Oscillation
NAPA	National Academy of Public Administration
NAS	National Academy of Sciences
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fishery Observer Program

NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NLCA	Nantucket Lightship closed area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS	National Standard
NSGs	National Standard Guidelines
NSTC	Northern Shrimp Technical Committee
NT	Net tonnage
NWA	Northwest Atlantic
OBDBS	Observer database system
OA2	Omnibus Essential Fish Habitat Amendment 2
OCS	Outer Continental Shelf
OFL	Overfishing Limit
OLE	Office for Law Enforcement (NMFS)
OY	Optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
PS/FG	Purse Seine/Fixed Gear
PSC	Potential Sector Contribution
QCM	Quota change model
RFA	Regulatory Flexibility Act
RFFA	Reasonably Foreseeable Future Action
RIR	Regulatory Impact Review
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
SASI	Swept Area Seabed Impact
SAV	Submerged Aquatic Vegetation
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SCAA	Statistical catch-at-age assessment model
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SFMA	Southern Fishery Management Area (monkfish)
SIA	Social Impact Assessment
SNE	Southern New England
SNE/MA	Southern New England-Mid-Atlantic
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TALFF	Total Allowable Level of Foreign Fishing
TC	Technical Committee
TED	Turtle excluder device

TEWG	Turtle Expert Working Group
TMGC	Trans-boundary Management Guidance Committee
TMS	Ten minute square
TRAC	Trans-boundary Resources Assessment Committee
TRT	Take Reduction Team
TSB	Total stock biomass
USAP	U.S. At-Sea Processing
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VEC	Valued Ecosystem Component
VMS	Vessel monitoring system
VPA	Virtual population analysis
VTR	Vessel trip report
WGOM	Western Gulf of Maine
WO	Weigh-out
YPR	Yield per recruit

3.0 Introduction and Background

3.1 Background

The primary statute governing the management of fishery resources in the Exclusive Economic Zone (EEZ) of the United States is the Magnuson-Stevens Fishery Conservation and Management Act (M-S Act). In brief, the purposes of the M-S Act are:

(1) To take immediate action to conserve and manage the fishery resources found off the coasts of the United States;

(2) To support and encourage the implementation and enforcement of international fishery agreements for the conservation and management of highly migratory species;

(3) To promote domestic and recreational fishing under sound conservation and management principles;

(4) To provide for the preparation and implementation, in accordance with national standards, of fishery management plans which will achieve and maintain, on a continuing basis, the optimum yield from each fishery;

(5) To establish Regional Fishery Management Councils to exercise sound judgment in the stewardship of fishery resources through the preparation, monitoring, and revisions of such plans under circumstances which enable public participation and which take into account the social and economic needs of the States.

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the M-S Act.

The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout, and Atlantic wolffish) off the New England and Mid-Atlantic coasts. Some of these species are sub-divided into individual stocks that are attributed to different geographic areas. Commercial and recreational fishermen harvest these species. The FMP has been updated through a series of amendments and framework adjustments.

Amendment 16, which became effective on May 1, 2010, was the most recent amendment to adopt a broad suite of management measures in order to achieve the fishing mortality targets necessary to rebuild overfished stocks and meet other requirements of the M-S Act. In 2011, the NEFMC also approved Amendment 17, which allowed for NOAA-sponsored state-operated permit banks to function within the structure of Amendment 16. Amendment 16 greatly expanded the sector management program and adopted a process for setting Annual Catch Limits that requires catch levels to be set in biennial specifications packages. Several lawsuits are challenging various provisions of Amendment 16, including the amendment’s provisions related to sectors and some of the accountability measures. Eight framework adjustments have updated the measures in Amendment 16.

Amendment 16 made major changes to the FMP. The Amendment adopted a system of Annual Catch Limits (ACLs) and Accountability Measure (AMs) that are designed to ensure catches remain below desired targets for each stock in the management complex. The National Standard Guidelines provide advisory guidance (that does not have the effect or force of law) for the implementation of these requirements (50CFR 600.310(g)). AMs are management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur. AMs should address and minimize both the

frequency and magnitude of overages and correct the problems that caused the overages in as short a time as possible. AMs can be either in season AMs or AMs for when the ACL is exceeded.
NMFS acknowledged in the publication of the guidelines that there is no requirement that AMs and ACLs be implemented as hard TACs or quotas, but conservation and management measures must be implemented so that the ACL is not exceeded and AMs must apply if the ACL is exceeded (74 FR 3184). While many measures in the management program are intended to control fishing mortality and might be interpreted to be AMs since they are "management controls to prevent the ACL from being exceeded," the term AM is usually applied to specific, automatic measures that are implemented either as an ACL is approached or after an ACL is exceeded.

This framework (Framework Adjustment 53, FW53) is intended to incorporate any status changes for groundfish stocks, set specifications for several groundfish stocks, and adjust management measures for commercial and recreational fisheries that catch groundfish stocks.

3.2 Purpose and Need for the Action

Periodic frameworks are used to adjust strategies in response to the evaluations that adjust rebuilding plans and overfishing. This framework (FW53) is-intended to incorporate any status changes for groundfish stocks, set specifications for several groundfish stocks, and adjust management measures for commercial and recreational fisheries that catch groundfish stocks. This action is needed meet regulatory requirements and adjust management measures that are necessary to prevent overfishing, ensure rebuilding, and help achieve optimum yield in the fishery consistent with the status of stocks and the requirements of MSA of 2006. The purpose of the action is XXX.

The measures analyzed in this EA are intended to meet the goals and many of the objectives of the Northeast Multispecies FMP, as modified in Amendment 16.

To better demonstrate the link between the purpose and need for this action, Table 1 summarizes the need for the action and corresponding purposes.

Table 1 - Purpose and Need for Framework 53 (to be updated)

Need for Framework 53	***Corresponding Purpose for Framework 53***

3.3 Brief History of the Northeast Multispecies Management Plan

Groundfish stocks were managed under the M-S Act beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan relied on hard quotas (total allowable catches, or TACs), and proved unworkable. The quota system was terminated in 1982 with the adoption of the Interim Groundfish Plan, which used minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank to control fishing mortality. The interim plan was replaced by the Northeast Multispecies FMP in 1986, which established biological targets in terms of maximum spawning potential and continued to rely on gear restrictions and minimum mesh size to control fishing mortality. A detailed discussion of the history of the FMP up to 1993 can be found in Amendment 5 (NEFMC 1993).

Amendment 5 was a major revision to the FMP. Adopted in 1994, it implemented a limited access program, reductions in time fished (days-at-sea, or DAS) for some fleet sectors and large seasonal Georges Bank and Southern New England area closures to help control mortality. Amendment 7 (NEFMC 1996), adopted in 1996, expanded the DAS program, accelerated the reduction in DAS first adopted in Amendment 5, and changed the seasonal area closures to year-round closures. After Amendment 7, there was a series of amendments and smaller changes (framework adjustments, FW) that are detailed in Amendment 13 (NEFMC 2003).

Amendment 13 was developed over a four-year period to meet MSA requirements such as adopting rebuilding programs for stocks that are overfished and ending overfishing. Subsequent to the implementation of Amendment 13, FW 40A provided opportunities to target healthy stocks, FW 40B improved the effectiveness of the effort control program, and FW 41 expanded the vessels eligible to participate in a Special Access Program (SAP) that targets GB haddock. FW 42 included measures to implement the biennial adjustment to the FMP as well as a Georges Bank yellowtail rebuilding strategy, several changes to the Category B (regular) DAS Program and two Special Access Programs, an extension of the DAS leasing program, and introduced the differential DAS system. FW 43 adopted haddock catch caps for the herring fishery and was implemented August 15, 2006.

Amendment 16 was adopted in 2009 and had major changes to the FMP. It greatly expanded the sector program and implemented Annual Catch Limits in compliance with 2006 revisions to the M-S Act. There were a host of mortality reduction measures for “common pool” (i.e. non-sector) vessels and the recreational component of the fishery. An appeal of the lawsuit filed by the Cities of Gloucester and New Bedford and several East Coast fishing industry members against Amendment 16 was heard by the U.S. Court of Appeals for the First Circuit in Boston in September, 2012. The court ruled against the plaintiffs and the provisions of Amendment 16 were upheld. Framework 44 was also adopted in 2009, and it set specifications for FY 2010 – 2012 and incorporated the best available information in adjusting effort control measures adopted in Amendment 16. Framework 45 was approved by the Council in 2010 and adopts further modifications to the sector program and fishery specifications; it was implemented May 1, 2011. Framework 46 revised the allocation of haddock to be caught by the herring fishery and was implemented in August 2011. Amendment 17 authorizes NOAA-sponsored state-operated permit banks and was implemented on April 23, 2012. Framework 47, implemented on May 1, 2012, set specifications for some groundfish stocks for FY 2012 – 2014, modified AMs for the groundfish fishery and the administration of the scallop fishery AMs, and revised common pool management measures; modification of the Ruhle trawl definition and clarification of regulations for charter/party and recreational groundfish vessels fishing in groundfish closed areas were proposed under the RA authority. Framework 48 was partially implemented on September 30, 2013; some measures are still in review. That action proposes revised status determination criteria for several stocks, modifies the sub-ACL system, adjusts monitoring measures for the groundfish fishery, and changes several accountability measures (AMs). Framework 50 was also implemented on May 1, 2013, and set specifications for many groundfish stocks and modified the rebuilding program for SNE/MA winter flounder. Framework 49 is a joint Northeast Multispecies/Atlantic Sea Scallop action that modified the dates for scallop vessel access to the year-round groundfish closed areas; this action was implemented on May 20, 2013. Framework 51 modified rebuilding programs for GOM cod and American plaice, set specifications for FY2014-2016 and modified management measures in order to ensure that overfishing does not occur including, additional management measures related to U.S./Canada shared stocks and yellowtail flounder in the groundfish and scallop fisheries. Framework Adjustment 52, submitted on October 28, 2014 is under review by NMFS and is intended to revise the accountability measures (AMs) for the groundfish fishery for the northern and southern windowpane flounder stocks. If adopted, revisions to the AMs could be applied retroactively for FY 2014 or any overages that occurred prior to FY 2014, where appropriate (i.e., AM would be revised in-season during FY 2014).

The final documents for all prior actions can be found on the internet at http://www.nefmc.org.

3.4 National Environmental Policy Act (NEPA)

NEPA provides a structure for identifying and evaluating the full spectrum of environmental issues associated with Federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document includes the required NEPA analyses.

3.5 Fishery Data Sources

This document includes fishery data from FY2009 to FY2013. This approach informs the analysis and provides a baseline for the public to better understand the operation of the fishery. Some differences in totals between this analysis and prior analyses exist.

A “groundfish trip” is defined here as a trip where groundfish is landed, and either applied to a sector Annual Catch Entitlement (ACE) or to the common pool ACL. Unless stated otherwise, NMFS compiled most of the gear and/or location-specific data presented here from VTRs, because it contains effort, gear, and positional data. Some of the data in this document, such as that concerning protected resources, is from the Northeast Fisheries Observer Program data set.

4.0 Alternatives Under Consideration

Under the provision of the M-S Act, the Council submits proposed management actions to the Secretary of Commerce for review. The Secretary of Commerce can approve, disapprove, or partially approve the action proposed by the Council~~. In the following alternative descriptions, measures identified as Preferred Alternatives constitute the Council's preferred management action.~~

4.1 Updates to Status Determination Criteria, Formal Rebuilding Programs and Annual Catch Limits

4.1.1 Revised Status Determination Criteria

4.1.1.1 Option 1: No Action

No Action. There would be no revisions to the status determination criteria of groundfish stocks (Table 2), and numerical estimates would not change (Table 3).

Table 2 – No Action status determination

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Gulf of Maine Cod	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Haddock	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Winter Flounder	Unknown	Unknown	F40% MSP
Georges Bank Yellowtail Flounder	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Winter Flounder	SSB_{MSY}	½ Btarget	F_{MSY}
Pollock	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP

Table 3 - No Action numerical estimates of SDCs

Stock	Model/ Approach	B_{MSY} or Proxy (mt)	F_{MSY} or Proxy	MSY (mt)
Gulf of Maine Cod	ASAP 0.2	54,743	0.18	9,399
	ASAP M-ramp	80,200	0.18	13,786
Gulf of Maine Haddock	ASAP	4,904	0.46	1177
Gulf of Maine Winter Flounder	Area Swept	NA	0.23 exploitation rate	NA
Georges Bank Yellowtail Flounder	VPA	43,200	0.25	9,400
Georges Bank Winter Flounder	VPA	11,800	0.42	4,400
Pollock	ASAP	91,000	0.41	16,200

4.1.1.2 Option 2: Revised Status Determination Criteria

Option 2 would adopt revised status determination criteria for GB yellowtail flounder (Table 4). The M-S Act requires that every fishery management plan specify "objective and measureable criteria for identifying when the fishery to which the plan applies is overfished." Guidance on this requirement identifies two elements that must be specified: a maximum fishing mortality threshold (or reasonable proxy) and a minimum stock size threshold. The M-S Act also requires that FMPs specify the maximum sustainable yield and optimum yield for the fishery.

The TRAC conducted an assessment in 2014 for GB yellowtail flounder. During the 2014 GB yellowtail flounder assessment, the TRAC agreed to no longer use the VPA assessment model, and instead, to use an empirical approach based on resource survey catches as the basis of catch advice. Because a stock assessment model framework is lacking for this stock, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. As well, status determination relative to reference points is not possible because reference points cannot be defined. These are now considered unknown (Table 4).

The NEFSC conducted update assessments in 2014 for the GOM cod, GOM winter flounder, GB winter flounder, and pollock, and a benchmark assessment for GOM haddock. This option updates the numerical estimates of the status determination criteria for these stocks. The 2014 GOM haddock benchmark assessment determined that the stock is not overfished and overfishing is not occurring in 2013. The status of the other stocks, based on the updated assessments, did not change. The 2012 assessment of GOM cod produced two models, M=0.2 and M-ramp. Numerical estimates from both models are provided, based on the updated 2014 assessment. The peer review recommended updated numerical values are provided in **Table 5**.

Rationale: This option would update the status determination criteria for GB yellowtail flounder to reflect the best available scientific information.

Table 4 - Option 2 status determination criteria

Stock	**Biomass Target (SSB_{MSY} or proxy)**	**Minimum Biomass Threshold**	**Maximum Fishing Mortality Threshold (F_{MSY} or proxy)**
Gulf of Maine Cod	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Haddock	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Winter Flounder	Unknown	Unknown	F40% MSP
Georges Bank Yellowtail Flounder	Unknown	Unknown	Unknown
Georges Bank Winter Flounder	SSB_{MSY}	½ Btarget	F_{MSY}
Pollock	SSB_{MSY}: SSB/R (40% MSP)	½ Btarget	F40% MSP

Table 5 - Option 2 numerical estimates of SDCs

Stock	Model/ Approach	B_{MSY} or Proxy (mt)	F_{MSY} or Proxy	MSY (mt)
Gulf of Maine Cod	ASAP 0.2	47,184	0.18	7,753
	ASAP M-ramp	69,621	0.18	11,388
Gulf of Maine Haddock	ASAP	4,108	0.46	955
Gulf of Maine Winter Flounder	Area Swept	NA	0.23 exploitation rate	NA
Georges Bank Yellowtail Flounder	Empirical Area Swept	NA	NA	NA
Georges Bank Winter Flounder	VPA	8,100	0.44	3,200
Pollock	ASAP	76,900	0.42	14,800

4.1.2 Annual Catch Limits

4.1.2.1 Option 1: No Action

No Action. There would be no changes to the specifications for FY 2015-FY 2016 that were adopted by FW 51(**Table 6**). For GOM winter flounder, GB winter flounder, GB yellowtail flounder, and pollock there would not be any specifications for these years.

There would be no FY 2015 quotas specified for the transboundary Georges Bank stocks (GB cod, GB haddock, GB yellowtail flounder), which are managed through the US/CA Resource Sharing Understanding. These quotas are specified annually.

Rationale: Because there would not be any specifications for some stocks, this alternative would not address M-S Act requirements to achieve OY and consider the needs of fishing communities. The No Action would also not be consistent with the best available scientific information.

Table 6 - No Action/Option 1 Northeast Multispecies OFLs, ABCs, ACLs, and other ACL sub-components for FY2015 (metric tons, live weight). Values are rounded to the nearest metric ton.

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Ground-fish Sub-ACL	Comm Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Prelim-inary Sectors Sub-ACL	Prelim-inary Non-Sector Ground-fish Sub-ACL	Small Mesh/ MWT Sub-ACL	Total ACL
GB Cod	2015	4,191	2,506	25	100	0	2,262		0	2,219	43	0	2,387
	2016												
	2017												
GOM Cod	2015	2,639	1,550	103	51	0		830	486	810	19	0	1,470
	2016												
	2017												
GB Haddock	2015	56,293	43,606	436	1,744	0	38,940		0	38,671	269	406	41,526
	2016												
	2017												
GOM Haddock	2015	561	435	6	9	0		280	111	278	3	4	412
	2016												
	2017												
GB Yellowtail Flounder	2015												
	2016												
	2017												

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Ground-fish Sub-ACL	Comm Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Prelim-inary Sectors Sub-ACL	Prelim-inary Non_ Sector Ground-fish Sub-ACL	Small Mesh/ MWT Sub-ACL	Total ACL
SNE/MA Yellowtail Flounder	2015	1,056	700	7	28	64	566		0	464	102	0	665
	2016												
	2017												
CC/GOM Yellowtail Flounder	2015	1,194	548	33	11	0	479		0	463	16	0	523
	2016												
	2017												
American Plaice	2015	2,021	1,544	31	31	0	1,408		0	1,382	26	0	1,470
	2016												
	2017												
Witch Flounder	2015	1,846	783	23	117	0	610		0	598	12	0	751
	2016												
	2017												
GB Winter Flounder	2015												
	2016												
	2017												
GOM Winter Flounder	2015												
	2016												
	2017												
SNE/MA Winter Flounder	2015	4,439	1,676	235	168	0	1,210		0	1,063	147	0	1,612
	2016												
	2017												
Redfish	2015	16,845	11,974	120	239	0	11,034		0	10,988	46	0	11,393
	2016												
	2017												

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Ground-fish Sub-ACL	Comm Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Prelim-inary Sectors Sub-ACL	Prelim-inary Non-Sector Ground fish Sub-ACL	Small Mesh/ MWT Sub-ACL	Total ACL
White Hake	2015	6,237	4,713	47	94	0	4,343		0	4,313	30	0	4,484
	2016	6,314	4,645	46	93	0	4,280		0	4,250	30	0	4,420
	2017												
Pollock	2015												
	2016												
	2017												
N. Window-pane Flounder	2015	202	151	2	44	0	98		0	0	98	0	144
	2016												
	2017												
S. Window-pane Flounder	2015	730	548	55	186	183	102		0	0	102	0	527
	2016												
	2017												
Ocean Pout	2015	313	235	2	21	0	197		0	0	197	0	220
	2016												
	2017												
Atlantic Halibut	2015	198	119	48	6	0	62		0	0	62	0	116
	2016												
	2017												
Atlantic Wolffish	2015	94	70	1	3	0	62		0	0	62	0	65
	2016												
	2017												

4.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Under Option 2, the annual specifications for FY 2015 - FY 2017 for pollock, GOM winter flounder, GB winter flounder, GOM haddock, and GOM cod would be as specified in Table 9. For all other stocks, except the transboundary Georges Bank stocks, the specifications included in Table 9 are the nearly the same values previously adopted in FW 51 and would be the same as those included in the No Action Alternative, except the US ABC will change for halibut, and the groundfish sub-ACL changes slightly given changes to the other sub-component values. Table 10 provides the preliminary common pool incidental catch TACs for Special Management Programs, based on the ACLs provided in Table 9, and Table 11 provides the Closed Area I Hook Gear Haddock SAP.

U.S./Canada TACs

This alternative would specify TACs for the U.S./Canada Management Area for FY 2015 as indicated in Table 7. If NMFS determines that FY 2014 catch of GB cod, haddock, or yellowtail flounder from the U.S./Canada Management Area exceeded the respective 2014 TAC, the U.S./Canada Resource Sharing Understanding and the regulations require that the 2015 TAC be reduced by the amount of the overage. Any overage reduction would be applied to the components of the fishery that caused the overage of the U.S. TAC in 2014. In order to minimize any disruption to the fishing industry, NMFS would attempt to make any necessary TAC adjustment in the first quarter of the fishing year.

Table 7 - Proposed FY2015 U.S./Canada TACs (mt) and Country Shares

TAC	Eastern GB Cod	Eastern GB Haddock	GB Yellowtail Flounder
Total Shared TAC	650 mt	37,000 mt	354 mt (Total ABC)
U.S. TAC	124 mt	17,760 mt	248 mt (US ABC)
Canada TAC	526 mt	19,240 mt	106 mt

A comparison of the proposed FY 2015 U.S. TACs and the FY 2014 U.S. TACs is shown in Table 8. Changes to the U.S. TACs reflect changes to the percentage shares, stock status, and the Transboundary Management Guidance Committee (TMGC) recommendations.

Table 8 - Comparison of the Proposed FY 2015 U.S. TACs and the FY 2014 U.S. TACs (mt)

Stock	U.S. TAC		Percent Change
	FY 2015	FY 2014	
Eastern GB cod	124 mt	154 mt	-19.5 %
Eastern GB haddock	17,760 mt	10,530 mt	+ 68.7 %
GB yellowtail flounder	248 mt	328 mt	-34.5 %

Rationale: This measure would adopt new specifications for groundfish stocks that are consistent with the most recent assessment information. For all stocks, only one alternative to No Action is shown. This is because the values in Option 2 represent the best scientific information, as determined by the Council’s

Scientific and Statistical Committee, and the M-S Act requires that catches not be set higher than these levels. Any catches below these levels would not mitigate economic impact on fishing communities.

The U.S. and Canada coordinate management of three stocks that overlap the boundary between the two countries on Georges Bank. Agreement on the amount to be caught is reached each year by the TMGC. This measure considers the recommendations of the TMGC that are consistent with the most recent assessments of those stocks.

Table 9 - Option 2 Northeast Multispecies OFLs, ABCs, ACLs and other ACL sub-components for FY 2015 – FY 2017 (metric tons, live weight). Values are rounded to the nearest metric ton. Sector shares based on 2014 PSCs. Only stocks that are underlined are proposed to be adjusted. Other stocks are provided for informational purposes. Grayed out values will be adjusted as a result of future recommendations of the TMGC.

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Ground-fish Sub-ACL	Comm Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Prelim-inary Sectors Sub-ACL	Prelim-inary Non-Sector Ground-fish Sub-ACL	Small Mesh/ MWT Sub-ACL	Total ACL
GB Cod	2015	4,191	1,980	20	79	0	1,787		0	1,753	34	0	1,886
	2016												
	2017												
GOM Cod	2015	514	386	26	13	0	328	207	121	202	5	0	366
	2016	514	386	26	13	0	328	207	121	202	5	0	366
	2017	514	386	26	13	0	328	207	121	202	5	0	366
GB Haddock	2015	56,293	24,366	244	975	0	21,759	21,759		21,608	150	227	23,204
	2016												
	2017												
GOM Haddock	2015	1,871	1,454	11	21	0	1,329	958	372	948	9	14	1,375
	2016	2,270	1,772	13	26	0	1,620	1,167	453	1,155	12	16	1,675
	2017	2,707	2,125	15	31	0	1,943	1,399	543	1,386	14	20	2,009
GB Yellowtail Flounder	2015		248		2	38	195	195		192	3	5	240
	2016		354		4	55	278	278		274	4	7	343
	2017												

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Preliminary Sectors Sub-ACL	Preliminary Non_ Sector Groundfish Sub-ACL	Small Mesh/ MWT Sub-ACL	Total ACL
SNE/MA Yellowtail Flounder	2015	1,056	700	14	28	66	557		0	457	101	0	666
	2016												
	2017												
CC/GOM Yellowtail Flounder	2015	1,194	548	38	27	0	458		0	443	16	0	524
	2016												
	2017												
American Plaice	2015	2,021	1,544	31	31	0	1,408		0	1,383	26	0	1,470
	2016												
	2017												
Witch Flounder	2015	1,846	783	23	117	0	610		0	598	12	0	751
	2016												
	2017												
GB Winter Flounder	2015	3,242	2,124	0	60	0	1,891		0	1,875	16	0	1,952
	2016	3,383	2,221	0	67	0	2,090		0	2,072	18	0	2,156
	2017	3,511	2,294	0	69	0	2,158		0	2,140	19	0	2,227
GOM Winter Flounder	2015	688	510	87	10	0	392		0	374	18	0	489
	2016	688	510	87	10	0	392		0	374	18	0	489
	2017	688	510	87	10	0	392		0	374	18	0	489
SNE/MA Winter Flounder	2015	4,439	1,676	117	184	0	1,306		0	1,147	159	0	1,607
	2016												
	2017												
Redfish	2015	16,845	11,974	120	239	0	11,034		0	10,988	46	0	11,393
	2016												
	2017												

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops	Ground-fish Sub-ACL	Comm Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Prelim-inary Sectors Sub-ACL	Prelim-inary Non_ Sector Ground fish Sub-ACL	Small Mesh/ MWT Sub-ACL	Total ACL
White Hake	2015	6,237	4,713	47	94	0	4,343		0	4,313	30	0	4,484
	2016	6,314	4,645	46	93	0	4,280		0	4,250	30	0	4,420
	2017												
<u>Pollock</u>	2015	21,538	16,600	996	1,162	0	13,720		0	13,632	88	0	15,878
	2016	21,864	16,600	996	1,162	0	13,720		0	13,632	88	0	15,878
	2017	24,598	16,600	996	1,162	0	13,720		0	13,632	88	0	
N. Window-pane Flounder (no scallop sub-ACL)	2015	202	151	2	44	0	98		0	0	98	0	144
	2016												
	2017												
N. Window-pane Flounder (scallop sub-ACL)	2015	202	151	2	2	20	118		0	0	118	0	141
	2015	202	151	2	2	11	126		0	0	126	0	141
	2015	202	151	2	2	3	135		0	0	135	0	141
S. Window-pane Flounder	2015	730	548	55	186	183	102		0	0	102	0	527
	2016												
	2017												
Ocean Pout	2015	313	235	2	24	0	195		0	0	195	0	220
	2016												
	2017												
Atlantic Halibut	2015	198	100	30	3	0	64		0	0	64	0	97
	2016												
	2017												
Atlantic Wolffish	2015	94	70	1	3	0	62		0	0	62	0	65
	2016												
	2017												

Table 10 - Option 2 Preliminary Common Pool Incidental Catch TACs for Special Management Programs (metric tons, live weight). These values may change as a result of changes in sector membership. White hake is no longer a stock of concern and has been removed.

Stock	Regular B DAS Program		Closed Area I Hook Gear Haddock SAP		Eastern U.S./Canada Haddock SAP	
	2015	2016	2015	2016	2015	2016
GB cod	0.3	0.0	0.1	0.0	0.2	-
GOM cod	0.0	0.0	-	-	-	-
GB yellowtail flounder	0.03	0.04	-	-	0.03	0.04
CC/GOM yellowtail flounder	0.2	0.0	-	-	-	-
American Plaice	1.3	0.0	-	-	-	-
Witch Flounder	0.6	0.0	-	-	-	-
SNE/MA winter flounder	1.5	0.0	-	-	-	-

Table 11 - FY 2015-2016 CAI Hook Gear Haddock SAP TACs (*to be updated*)

Year	Exploitable Biomass (thousand mt)	WGB Exploitable Biomass	B(year)/B2004	TAC (mt, live weight)
2015				
2016				

4.1.3 SNE/MA Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

4.1.3.1 Option 1: No Action

The No Action alternative would continue to maintain a single commercial sub-ACL for the SNE/MA windowpane flounder stock. The AMs for the commercial groundfish fishery would continue to account for overages of the overall ACL.

Rationale: This option would not distribute the commercial sub-ACL for SNE/MA windownpane flounder between sectors and the common pool. This option would simplify accounting, but would mean that both sectors and the common pool would be accountable for any overages of the ACL.

4.1.3.2 Option 2: **[Placeholder]** Create SNE/MA Windowpane Flounder sub-ACLs for Groundfish Sectors and the Common Pool

If selected, Option 2 would split the SNE/MA windowpane flounder stocks into sub-ACLs for groundfish sectors and the common pool based on a specified percentage XXX. The Council would select a percentage for this measure that would apply to all future allocations (Table 12).

Rationale: NMFS began tracking fleet-specific catches of SNE/MA windowpane flounder by sectors and the common-pool in FY 2010 after the adoption and implementation of Amendment 16. This measure would split the commercial sub-ACL between sectors and the common pool based on each fleet’s catch history from FY 2010 – FY 2013. However, this measure alone does not necessarily make groundfish sectors and the common pool accountable for their own catches of SNE/MA windowpane flounder because it does not change the AM. The AM is triggered for all commercial groundfish vessels (common pool and sectors) if the groundfish sub-ACL is exceeded and the total ACL is also exceeded by the greater than the management uncertainty buffer.

Table 12 - SNE/MA Windowpane Flounder Catch (mt & %) by Sectors and the Common Pool.

	Groundfish ACL (mt)	Sector (mt)	Common-Pool (mt)	Total GF catch (mt)
2010	**154**	52.7	20.9	73.6
2011	**154**	83	28.5	111.5
2012	**72**	95.9	10.6	106.5
2013	**102**	86	30	116
Median		84.5	20.9	109
Mean		79.4	20.9	101.9

	Total Catch of Groundfish ACL (%)	Sector Catch(%)	Common-Pool (%)
2010	**47.8%**	71.6%	28.4%
2011	**72.4%**	74.4%	25.6%
2012	**147.9%**	90.0%	10.0%
2013	**113.7%**	74.1%	25.9%

4.1.4 GOM/GB Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

4.1.4.1 Option 1: No Action

The No Action alternative would continue to maintain a single commercial sub-ACL for the GOM/GB windowpane flounder stock. The AMs for the commercial groundfish fishery would continue to account for overages of the overall ACL.

Rationale: This option would not distribute the commercial sub-ACL for GOM/GB windownpane flounder between sectors and the common pool. This option would simplify accounting, but would mean that both sectors and the common pool would be accountable for any overages of the ACL.

4.1.4.2 Option 2: **[Placeholder]** Create GOM/GB Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

If selected, Option 2 would split the GOM/GB windowpane flounder stock into sub-ACLs for groundfish sectors and the common pool based on a specified percentage XXX. The Council would select a percentage for this measure that would apply to all future allocations (Table 13).

Rationale: NMFS began tracking fleet-specific catches of GOM/GB windowpane flounder by sectors and the common-pool in FY 2010 after the adoption and implementation of Amendment 16. This measure would split the commercial sub-ACL between sectors and the common pool based on each fleet's catch history from FY 2010 – FY 2013. However, this measure alone does not necessarily make groundfish sectors and the common pool accountable for their own catches of GOM/GB windowpane flounder because it does not change the AM. The AM is triggered for all commercial groundfish vessels (common pool and sectors) if the groundfish sub-ACL is exceeded and the total ACL is also exceeded by the greater than the management uncertainty buffer.

Table 13: GOM/GB Windowpane Catch (mt & %) by Sectors and the Common Pool.

	Groundfish ACL (mt)	Sector catch (mt)	Common-Pool catch (mt)	Total GF catch (mt)
2010	**110**	151.7	1.8	153.5
2011	**110**	156.2	0.3	156.5
2012	**129**	129.5	0.1	129.6
2013	**98**	237.3	0.2	237.5
Median		154	0.25	155
Mean		168.7	0.6	169.3

	Catch of Groundfish ACL (%)	Sector catch (%)	Common-Pool catch (%)
2010	**139.5%**	98.83%	1.17%
2011	**142.3%**	99.81%	0.19%
2012	**100.5%**	99.92%	0.08%
2013	**242.3%**	99.92%	0.08%

4.1.5 GOM/GB Windowpane Flounder Scallop Fishery Sub-ACL

4.1.5.1 Option 1: No Action

The No Action alternative would not create a sub-ACL for GOM/GB windowpane flounder. Only the commercial groundfish fishery would have a sub-ACL for this stock, and the AMs for the fishery must be sufficient to account for overages of the overall ACL. The scallop fishery catch would continue to be accounted for under the other sub-components category of the ACL.

Rationale: This option would not distribute the ACL for GOM/GB windowpane flounder to other fisheries. This option would simplify accounting, but would mean that the groundfish fishery would be responsible for any overages of the ACL, regardless of what fishery caused the overage.

4.1.5.2 Option 2: Create a Scallop Fishery GOM/GB Windowpane Flounder Sub-ACL

If this option is adopted, a sub-ACL of GOM/GB (northern) windowpane flounder would be allocated to the scallop fishery based on a percentage of recent catches (2%-14%) as shown in Table 14. Catches of this stock by scallop vessels would no longer be counted as part of the "other sub-components" category. The scallop sub-ACL would be based on recent scallop fishery catches (as a percent of the total) for the period calendar year 2001 through 2010. The selected percentage of the ABC would be used to determine the scallop fishery sub-ABC, and then adjusted downwards for management uncertainty to calculate the scallop fishery sub-ACL. Catches of this stock by scallop vessels would no longer be counted as part of the “other sub-components” category of the ACL, and the amount set-aside for the other sub-components would be reduced (Table 9).

To identify the scallop fishery catch history of GOM/GB windowpane flounder, it is important to note that prior to 2004, there was limited observer coverage of the General Category scallop dredge fleet, and discards from this fleet were not included in the 2012 Assessment Update for GOM/GB windowpane flounder. From 2004 to 2011, the average General Category catch of this stock was 4 mt, and this catch assumption was added to the scallop fishery catch values for each year from 2001 through 2010.

Based on these updated catches for calendar year 2001-2010 (see **Table 14**):

- The 90th percentile would be 14 % (rounded up from 13.7%) of all catches for this stock.
- The median would be 8% (rounded up from 7.6%) of all catches for this stock.
- The mean would be 8% (rounded up from 7.8%) of all catches for this stock.
- The range would be 2 % (rounded down from 2.2%) to 14% (rounded up from 13.9%) of all catches for this stock.

Specific scallop fishery AMs would be adopted by the scallop FMP within one year of the implementation of this sub-ACL. Any scallop fishery overage in FY 2015 would be subject to the AMs that are adopted through the scallop FMP. Consistent with the approach adopted in Framework 47 to the multispecies FMP, any scallop fishery AMs for this sub-ACL would only be triggered if: 1) the scallop fishery sub-ACL is exceeded and the total ACL is also exceeded; or 2) the scallop fishery sub-ACL is exceeded by more than 50 percent.

Rationale: The scallop fishery catches of this stock are large enough that the effectiveness of the AM system could be undermined if those catches are not subject to a scallop specific AM. In addition, adopting an allocation for the scallop fishery would also ensure the groundfish fishery is not negatively affected by any overage caused by the scallop fishery. The scallop fishery is virtually the sole contributor of the other sub-component catches. For these reasons, only this component was pursued for development of an allocation at this time.

Table 14 - Limited access scallop fishery discards of GOM/GB windowpane flounder, 2001-2010. Landings were less than 1 metric ton in all years. Catch from Table I2 in the 2012 GF Updates pp. 571. LA Scallop Dredge from Table I5 in the 2012 GF Updates pp. 573-574. General Category estimated catch was 4 mt, an average of 2004-2011 discards, using the same method as the in the 2012 GF Updates.

Calendar Year	Catch (mt)	Limited Access Scallop Dredge (mt)	Limited Access Scallop Fishery Catches as Percent of Total	General Category Scallop Fishery Catch Assumption (mt)	Total Scallop Fishery Catch As Percent of Total
	A	B	B/A	C	(B+C)/(A+C)
2001	229	22	9.6%	4	11.2%
2002	176	21	11.9%	4	13.9%
2003	377	13	3.4%	4	4.5%
2004	328	7	2.1%	4	3.3%
2005	968	17	1.8%	4	2.2%
2006	683	73	10.7%	4	11.2%
2007	1091	98	9.0%	4	9.3%
2008	376	43	11.4%	4	12.4%
2009	440	15	3.4%	4	4.3%
2010	236	9	3.8%	4	5.4%
		Mean (average), 2001-2010	6.7%		7.8%
		Median, 2001-2010	6.4%		7.6%
		90th percentile, 2001-2010	11.9%		13.7%

4.2 Commercial and Recreational Fishery Measures

4.2.1 GOM Cod Spawning Area Closures

4.2.1.1 Option 1: No Action

The No Action alternative maintains the current GOM cod spawning protection area for commercial and recreational vessels.

GOM Cod Spawning Closure Area (Whaleback)
The GOM cod spawning closure area is defined by the following coordinates and illustrated in Figure 1.

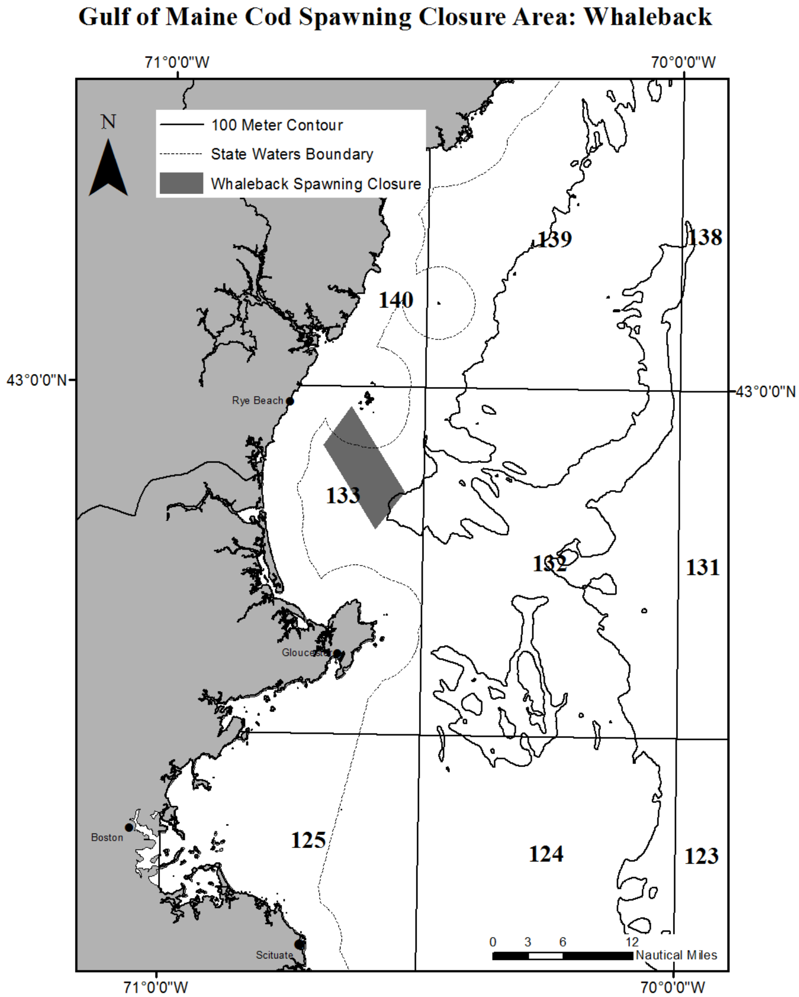
42-50.95 N	70-32.22 W
42-47.65 N	70-35.64 W
42-54.91 N	70-41.88 W
42-58.27 N	70-38.64 W

Provisions that apply to the area:

- All commercial fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from June 1 through June 30. Only fishing with exempted gear (that is, gear deemed not capable of catching groundfish as defined by 50 CFR 648.2) is allowed in the area.
- Recreational fishing vessels (including party-charter vessels) are subject to the following restrictions:
  - All recreational fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from April through June. Only pelagic hook and line gear, as defined in the commercial fishing exempted gear regulations, is allowed for use in the area.
- A fishing vessel (commercial or recreational) may transit the area as long as gear is properly stowed in accordance with regulations promulgated by the Regional Administrator.
- The take or possession of any groundfish species by vessels using exempted gear in this area from April through June is prohibited.

Rationale: This measure maintains the existing GOM cod spawning area, and continues to restrict commercial and recreational fishing in an inshore area in the GOM that has been identified as being important for cod spawning in the spring. This closure would continue to reduce fishing impacts on spring spawners, and thus contribute to rebuilding of the GOM cod stock. The area would continue to provide protection to spawning cod by limiting fishing at times and in an area in the spring when cod return to this discrete area to spawn.

Figure 1 - Existing Gulf of Maine Cod Spawning Closure Area (Whaleback) is shown in gray located within Block 133.



4.2.1.2 Option 2: Additional GOM Cod Spawning Protection Measures

The Council may select Sub-Option A or Sub-Option B.

Additional GOM cod spawning closures would be created in the Gulf of Maine for commercial and recreational groundfish fisheries. The proposed GOM cod spawning closure areas coincide with other management measures in time and space (e.g. Gulf of Maine Rolling Closures & the Western Gulf of Maine Closed Area), but are not considered replacements to these other management areas.

Rationale: This Option would restrict commercial and recreational fishing in inshore areas in the GOM that have been identified as being important for cod spawning by the CATT and other information related to cod spawning. This alternative is designed to reduce fishing impacts on spawning cod during times of year when cod are known to be spawning (e.g. winter and spring), and thus contribute to rebuilding the GOM cod stock. Fishing can interfere with spawning success and therefore productivity in a number of ways including: removal of spawning fish before they have the opportunity to spawn, dispersal of spawning fish, and disruption of spawning behavior. The closure areas are intended to provide protection to spawning cod by limiting fishing at times and areas when cod are in spawning condition, and by preventing fishing from interfering with spawning activity.

Sub-Option A: If selected, this option would create seasonal GOM cod spawning closure areas in discreet 30-minute blocks and a year-round spawning closure using the boundaries of the existing Western Gulf of Maine (WGOM) Closed Area (Figure 2).

All commercial and recreational groundfish fishing would be prohibited:

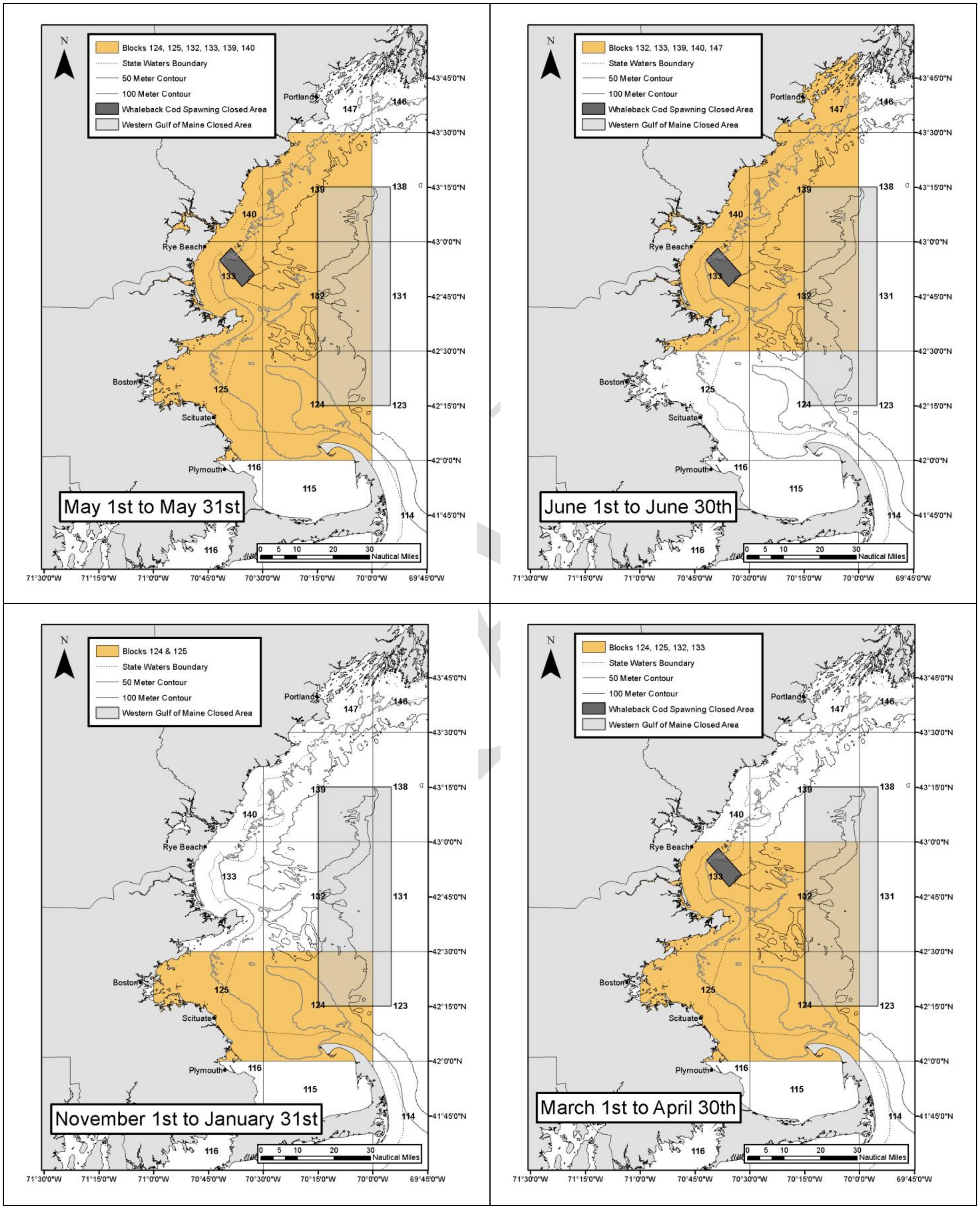
- Year-round in the WGOM Closed Area and;
- Seasonally in the following 30-minute blocks during these months:
  - May: 124, 125, 132, 133, 139, 140
  - June: 132, 133, 139, 140, 147
  - November – January: 124-125
  - March-April: 124, 125, 132, 133

Provisions that apply to Sub-Option A:

- All commercial fishing vessels using gear capable of catching groundfish are prohibited from fishing in the areas during the dates specified. Only fishing with exempted gear (that is, gear deemed not capable of catching groundfish as defined by 50 CFR 648.2) is allowed in the area.
- Recreational fishing vessels (including party-charter vessels) are subject to the following restrictions:
  - All recreational fishing vessels using gear capable of catching groundfish are prohibited from fishing in the areas during the dates specified. Only pelagic hook and line gear, as defined in the commercial fishing exempted gear regulations, is allowed for use in the area.
- A fishing vessel (commercial or recreational) may transit the area as long as gear is properly stowed in accordance with regulations promulgated by the Regional Administrator.
- The take or possession of any groundfish species by vessels using exempted gear would be prohibited in the areas described above.

Rationale: This measure would restrict commercial and recreational fishing in areas in the GOM that have been identified as being important for winter and spring cod spawning. This alternative is designed to reduce fishing impacts on seasonal spawners during the winter and spring for all groundfish fishing, and thus contribute to rebuilding the GOM cod stock. Sub-Option A is more conservative than Sub-Option B as it captures more of the GOM cod spawning activity.

Figure 2 - Sub-Option A proposed GOM cod spawning closure areas in May (top left), June (top right), November-January (bottom left), March-April (bottom right).



Sub-Option B: If selected, this option would create seasonal GOM cod spawning closure areas in discreet 30-minute blocks. All commercial and recreational groundfish fishing would be prohibited in the following 30-minute blocks (Figure 3):

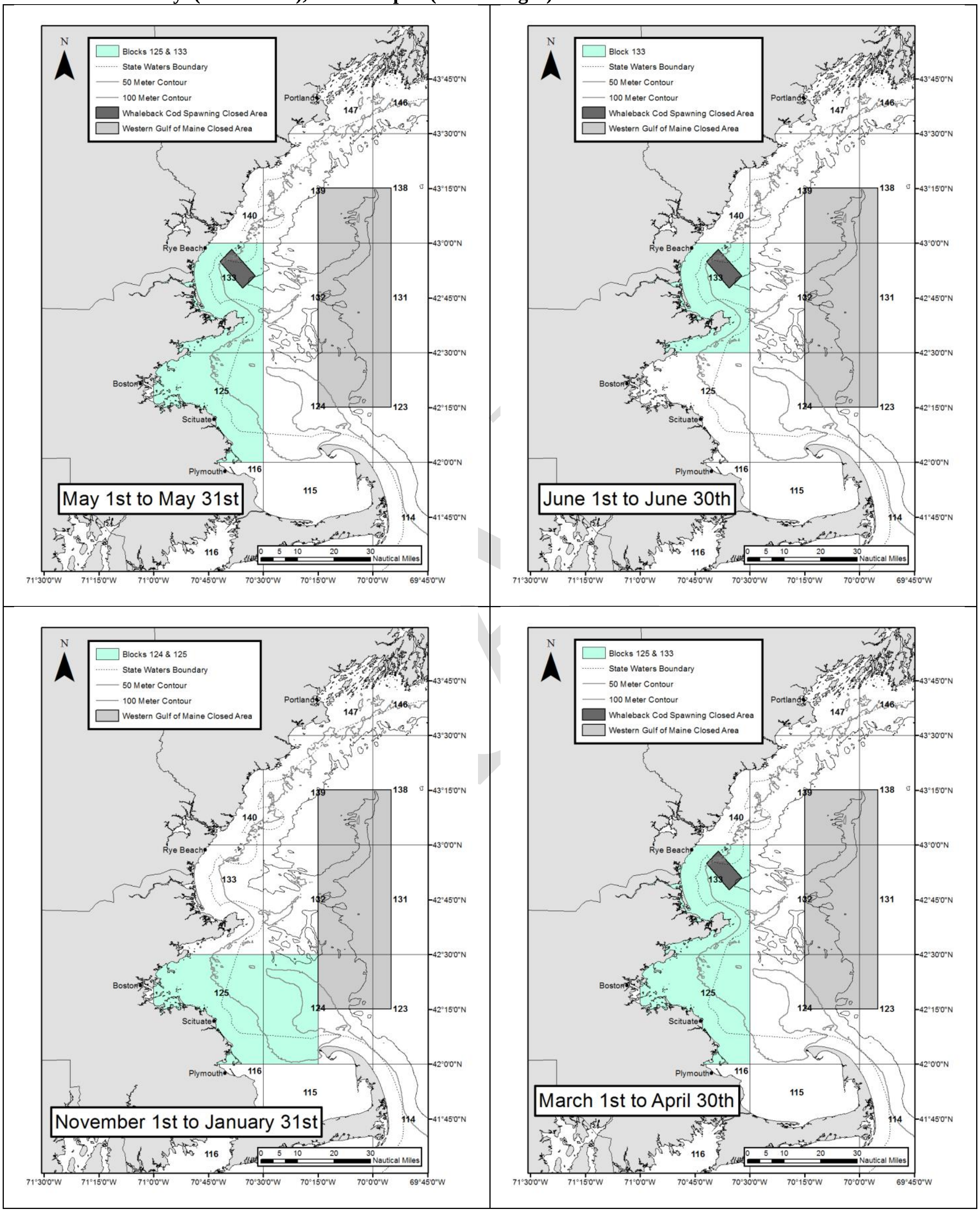
- May: 125, 133
- June: 133
- November – January: 124 with an eastern boundary defined at 70-15, 125
- March-April: 125, 133

Provisions that apply to Sub-Option B:

- All commercial fishing vessels using gear capable of catching groundfish are prohibited from fishing in the areas during the dates specified. Only fishing with exempted gear (that is, gear deemed not capable of catching groundfish as defined by 50 CFR 648.2) is allowed in the area.
- Recreational fishing vessels (including party-charter vessels) are subject to the following restrictions:
    - All recreational fishing vessels using gear capable of catching groundfish are prohibited from fishing in the areas during the dates specified. Only pelagic hook and line gear, as defined in the commercial fishing exempted gear regulations, is allowed for use in the area.
- A fishing vessel (commercial or recreational) may transit the area as long as gear is properly stowed in accordance with regulations promulgated by the Regional Administrator.
- The take or possession of any groundfish species by vessels using exempted gear would be prohibited in the areas described above.

Rationale: This measure would restrict commercial and recreational fishing in areas in the GOM that have been identified as being important for seasonal cod spawning. This alternative is designed using smaller closure areas to protect spawning cod and is less conservative than Sub-Option A as it captures some GOM cod spawning activity.

Figure 3 - Sub-Option B proposed GOM cod spawning closure areas in May (top left), June (top right), November-January (bottom left), March-April (bottom right).



4.2.2 Prohibition on the Possession of GOM cod

4.2.2.1 Option 1: No Action

No Action. There would be no revision to the retention regulations of GOM cod.

Rationale: Due to concerns about discarding of GOM cod, this option would maintain accountability for catches of this stock. This measure would continue to allow possession and landing of GOM cod in order to promote achieving OY and minimize bycatch consistent with National Standard 9. Landing GOM cod would also allow continued collection of biological samples from landed fish.

4.2.2.2 Option 2: Prohibition on the possession of GOM cod

Commercial and recreational vessels would be required to discard all catch of GOM cod (i.e., zero possession). There would be no change in how GOM cod is allocated, and there would be no changes made to catch accounting or accountability measures.

Rationale: Fishing mortality on Gulf of Maine cod needs to be substantially reduced based on recent assessment findings. Prohibiting the possession of GOM cod while retaining ACLs and AMs for the recreational and commercial fisheries would discourage targeted fishing on this stock. However, this measure increases the uncertainty of catch estimates because all catch would be discards.

4.2.3 Observer Requirements in the Gulf of Maine

4.2.3.1 Option 1: No Action

There would be no revision to existing regulations. Commercial vessels would be permitted to fish throughout the Gulf of Maine, and in multiple broad stock areas on a given trip, provided they comply with all applicable federal reporting requirements.

Rationale: There would be no revisions to the requirements for when a commercial vessel would need to take an observer in order to go fishing. The No Action alternative would continue to provide flexibility to be able to fish for cod in GB and GOM on a single trip without any additional stipulations.

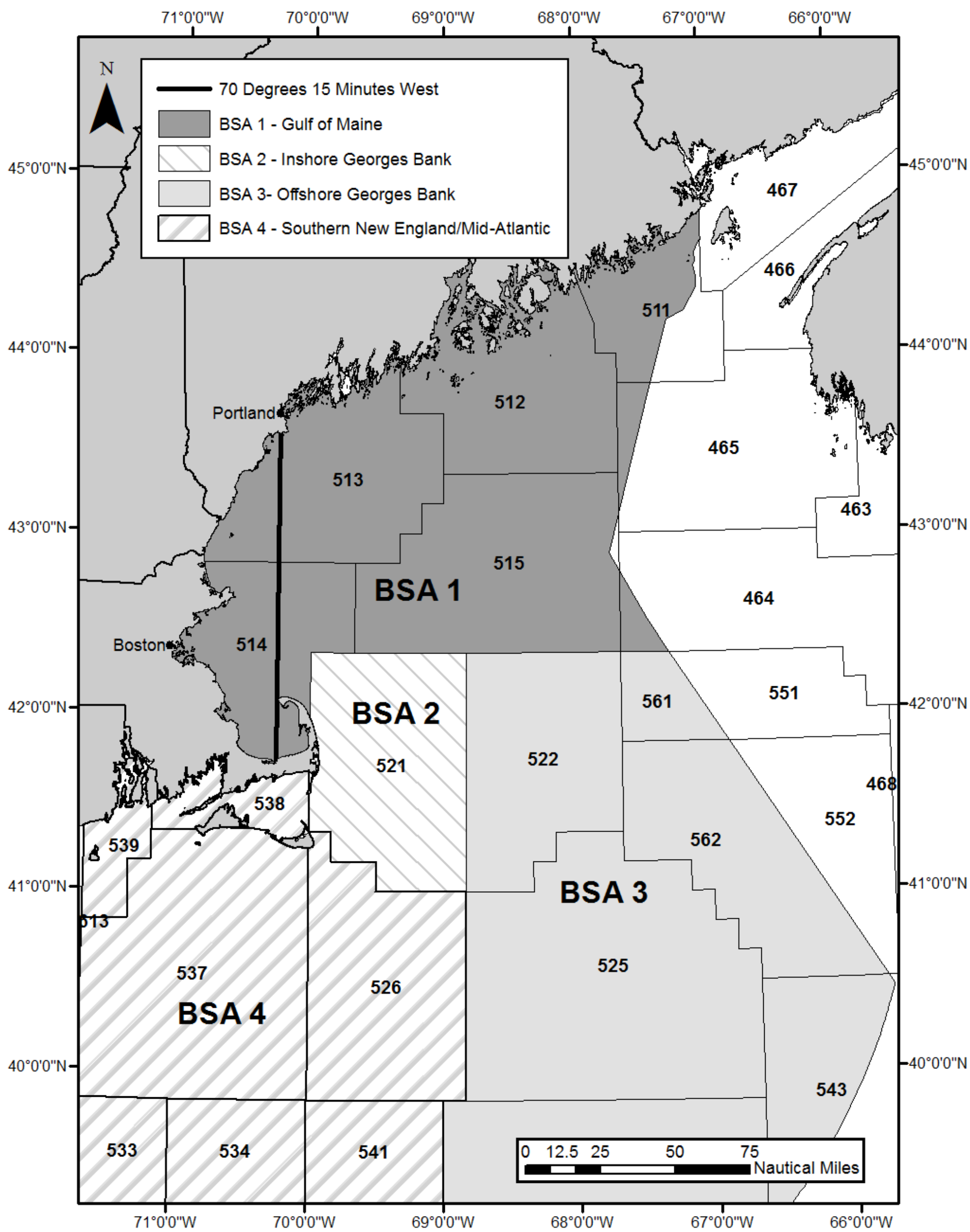
4.2.3.2 Option 2: Revised Observer Requirements on trips in the GOM and GB cod broad stock areas

If selected, Option 2 would prohibit commercial vessels from fishing in the GOM west of 70° 15’ W longitude and any other broad stock area (e.g., BSA2, BSA3, BSA4) on the same trip, unless carrying an observer (Figure 4). However, vessels fishing only in the GOM cod stock area (BSA1) would not be restricted by this measure. As an example, a vessel fishing only in the BSA1/GOM cod stock area on a given trip could fish on either side of the 70° 15’ W longitude line, even if an observer was not on board. A vessel carrying an observer would not be restricted in where they could fish on a given trip (i.e., these vessels could fish in all BSAs). Trip declarations of the area that would be fished would be made to NMFS and via the Trip Start Hail report through a vessel’s VMS system.

Rationale: This option aims to improve catch accounting of GOM and GB cod by restricting where commercial vessels can fish when not carrying an observer. Vessels carrying an observer would not be restricted by this measure. Option 2 is designed in a similar manner to measures adopted in Northeast

Groundfish Sector operations plans. For observed trips, this option would provide flexibility to be able to fish in both cod broad stock areas on a single trip.

Figure 4 - Map of Broad Stock Reporting Areas, highlighting the 70° 15' W longitude.



4.2.4 Rollover of Groundfish Specifications

4.2.4.1 Option 1: No Action

In the event of a delay in rulemaking, there would be no fishing for stocks without specifications in place on May 1, nor any fishing for other groundfish stocks that share the same Broad Stock Area as stocks with no specifications.

Rationale: Because the fishing year would begin without specifications in place, the No Action alternative would not address M-S Act requirements to achieve OY and consider the needs of fishing communities.

4.2.4.2 Option 2: Percentage Rollover Provisions for Specifications

If this option is selected, a percentage of the prior year's ACL, as identified in the sub-options below, would be rolled over in the absence of specifications due to a delay in rulemaking. However, the rollover ACL may not exceed the anticipated ABC for the upcoming FY. Rollover specifications would be replaced by approved OFL and ABC values upon rulemaking. All catches occurring while rollover specifications are in place (after May 1st through final rulemaking) would be counted against each component's allocation and the updated ACL for the FY.

Rationale: This measure would allow a directed groundfish fishery to begin on-time in the event that specifications were not in place in time for the start of the fishing year. A percentage less than 100% of the prior year's OFL, ABC, and ACL reflects a more precautionary approach to rollover provisions than carrying forward 100% of the prior year's specifications as is done in other FMPs. However, any anticipated delays in specifications actions are minor, and the duration of the "rollover period" is expected to be relatively brief. Nothing in this measure would change the distribution or conditions of the commercial and recreational fishery allocations (e.g. trimester TACs and 20% holdback for groundfish sector ACE).

The Council may select either sub-option A, B, or C.

Sub-Option A: Rollover 35% of all groundfish stocks to the following FY.

If selected, this option would allow for an 35% rollover of the prior year's ACL for all groundfish stocks for implementation at the start of the following FY unless the rollover value of the specifications exceed ABC recommendations.

Rationale: Reducing the allowable catch in the fishery by 65% builds in precaution to protect stocks whose status may have changed.

Sub-Option B: Rollover 20% of all groundfish stocks to the following FY.

If selected, this option would allow for an 20% rollover of the prior year's ACL for all groundfish stocks for implementation at the start of the following FY unless the rollover value of the specifications exceed ABC recommendations.

Rationale: Reducing the allowable catch in the fishery by 80% builds in precaution to protect stocks whose status may have changed.

Sub-Option C: Rollover 10% of all groundfish stocks to the following FY.

If selected, this approach would allow for an 10% rollover of the prior year's ACL for all groundfish stocks for implementation at the start of the following FY unless the rollover value of the specifications exceed ABC recommendations.

Rationale: Reducing the allowable catch in the fishery by 90% builds in precaution to protect stocks whose status may have changed.

4.2.5 Sector ACE Carryover

4.2.5.1 Option 1: No Action

The No Action alternative would continue to allow groundfish sectors to carry over up to 10% of their unused sector ACE, as outline in Amendment 16 to the Northeast multispecies FMP.

Note: The No Action would be inconsistent with a ruling from the U.S. District Court for the District of Columbia that invalidated and vacated carryover provisions included in the in Framework Adjustment 50 rulemaking. The ruling specified that the value of the stock-specific ACL plus the carryover of unused ACE may not exceed the following year's ABC. While the Court's ruling invalidated the carryover provision included in the Framework Adjustment 50 rulemaking, it did not change carryover rules adopted in Amendment 16.

4.2.5.2 Option 2: Modification to Sector ACE carryover

This option would modify Amendment 16 carryover provisions. Groundfish sectors would be able to carry forward up to 10% of unused ACE provided that the total unused sector ACE carried forward for all sectors from the previous FY plus the total ACL does not exceed the ABC for the fishing year in which the carryover would be harvested (e.g., from FY 2014 to FY 2015). This alternative does not change the accountability measure criteria previously adopted by NMFS' May 2014 carryover action. Sectors would continue to be required to pay back carried over catch used only when both the sector sub-ACL and total ACL are exceeded.

Rationale: This option addresses the U.S. District Court for the District of Columbia's April 4, 2014 ruling on NMFS' carryover-related measures included in the Framework Adjustment 50 rulemaking, which invalidated and vacated the FY 2013 carryover measures. The ruling also specified that a 'total potential catch' (the total ACL plus 10% unused ACE carryover) cannot exceed the ABC for any stock. This revision is necessary to cap the amount of carryover that can be harvested to ensure that the 'total potential catch' (i.e., total ACL + max. carryover) does not exceed the ABC for the fishing year in which the carried over ACE may be harvested.

5.0 Alternatives Considered and Rejected

This section will be updated prior to final submission.

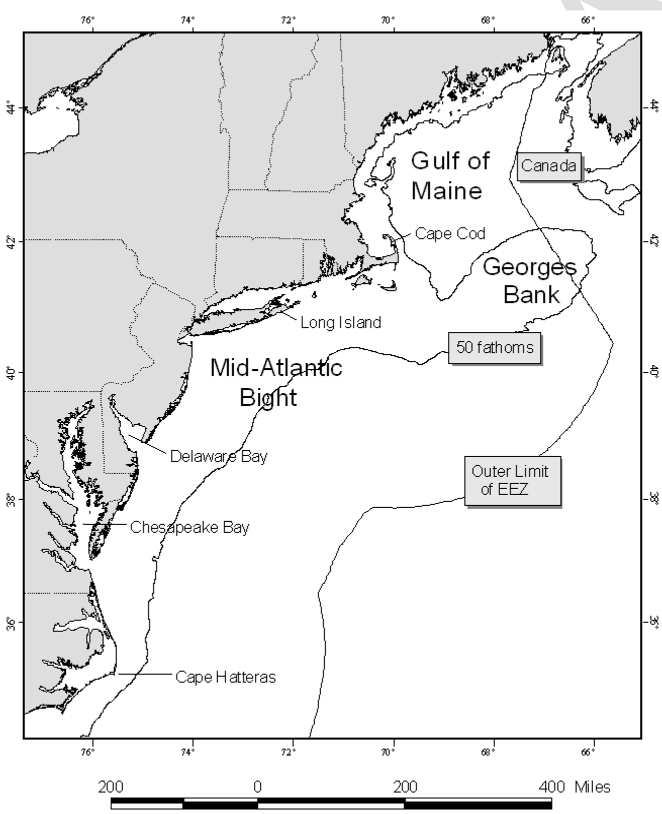
6.0 Affected Environment

The Valued Ecosystem Components (VECs) affected by the Preferred Alternatives include the physical environment, Essential Fish Habitat (EFH), target species, non-target species/bycatch, protected resources, and human communities, which are described below.

6.1 Physical Environment/Habitat/EFH

The Northeast U.S. Shelf Ecosystem (Figure 5) includes the area from the Gulf of Maine south to Cape Hatteras, North Carolina. It extends from the coast seaward to the edge of the continental shelf and offshore to the Gulf Stream (Sherman et al. 1996). The continental slope includes the area seaward of the shelf, out to a depth of 6,562 feet (ft.) [2,000 meters (m)]. Four distinct sub-regions comprise the NMFS Northeast Region: the Gulf of Maine, Georges Bank, the southern New England/Mid-Atlantic region, and the continental slope. Sectors primarily fish in the inshore and offshore waters of the Gulf of Maine, Georges Bank, and the southern New England/Mid-Atlantic areas. Therefore, the description of the physical and biological environment focuses on these sub-regions. Information in this section was extracted from Stevenson et al. (2004).

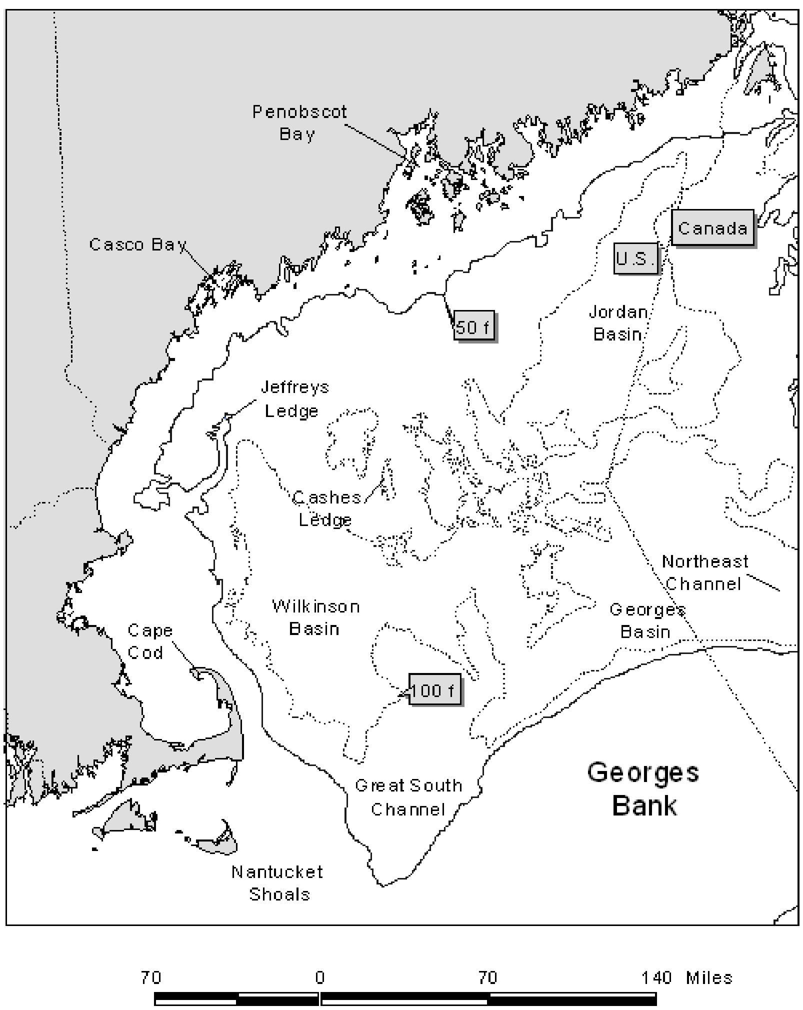
Figure 5 – Northeast U.S. Shelf Ecosystem



6.1.1 Gulf of Maine

The Gulf of Maine is bounded on the east by Browns Bank, on the north by the Nova Scotia (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Figure 6). The Gulf of Maine is a boreal environment characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. There are 21 distinct basins separated by ridges, banks, and swells. Depths in the basins exceed 820 ft. (250 m), with a maximum depth of 1,148 ft. (350 m) in Georges Basin, just north of Georges Bank. High points within the Gulf of Maine include irregular ridges, such as Cashes Ledge, which peaks at 30 ft. (9 m) below the surface.

Figure 6 – Gulf of Maine



The Gulf of Maine is an enclosed coastal sea that was glacially derived and is characterized by a system of deep basins, moraines, and rocky protrusions. The Gulf of Maine is topographically diverse from the rest of the continental border of the U.S. Atlantic coast (Stevenson et al. 2004). Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel,[1] sometimes with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a water depth of about 197 ft. (60 m). Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Gravel is most abundant at depths of 66 to 131 ft. (20 to 40 m), except off eastern Maine where a gravel-covered plain exists to depths of at least 328 ft. (100 m). Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

The geologic features of the Gulf of Maine coupled with the vertical variation in water properties (e.g., salinity, depth, temperature) combine to provide a great diversity of habitat types that support a rich biological community. To illustrate this, a brief description of benthic invertebrates and demersal (i.e., bottom-dwelling) fish that occupy the Gulf of Maine is provided below. Additional information is provided in Stevenson et al. (2004), which is incorporated by reference.

The most common groups of benthic invertebrates in the Gulf of Maine reported by Theroux and Wigley (1998) in terms of numbers collected were annelid worms, bivalve mollusks, and amphipod crustaceans. Bivalves, sea cucumbers, sand dollars, annelids, and sea anemones dominated biomass. Watling (1998) identified seven different bottom assemblages that occur on the following habitat types:

1. Sandy offshore banks: fauna are characteristically sand dwellers with an abundant interstitial component;
2. Rocky offshore ledges: fauna are predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers;
3. Shallow [<197 ft. (60 m)] temperate bottoms with mixed substrate: fauna population is rich and diverse, primarily comprised of polychaetes and crustaceans;
4. Primarily fine muds at depths of 197 to 459 ft. (60 to 140 m) within cold Gulf of Maine Intermediate Water:[2] fauna are dominated by polychaetes, shrimp, and cerianthid anemones;
5. Cold deep water, muddy bottom: fauna include species with wide temperature tolerances which are sparsely distributed, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthids also present;
6. Deep basin, muddy bottom, overlaying water usually 45 to 46 °F (7 to 8°C): fauna densities are not high, dominated by brittle stars and sea pens, and sporadically by tube-making amphipods; and
7. Upper slope, mixed sediment of either fine muds or mixture of mud and gravel, water temperatures always greater than 46 °F (8°C): upper slope fauna extending into the Northeast Channel.

[1] The term “gravel,” as used in this analysis, is a collective term that includes granules, pebbles, cobbles, and boulders in order of increasing size. Therefore, the term “gravel” refers to particles larger than sand and generally denotes a variety of “hard bottom” substrates.

[2] Maine Intermediate Water is described as a mid-depth layer of water that preserves winter salinity and temperatures, and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western Gulf of Maine.

Two studies (Gabriel 1992; Overholtz & Tyler 1985) reported common[3] demersal fish species by assemblages in the Gulf of Maine and Georges Bank:

- Deepwater/Slope and Canyon: offshore hake, blackbelly rosefish, Gulf stream flounder;
- Intermediate/Combination of Deepwater Gulf of Maine-Georges Bank and Gulf of Maine-Georges Bank Transition: silver hake, red hake, goosefish (monkfish);
- Shallow/Gulf of Maine-Georges Bank Transition Zone: Atlantic cod, haddock, pollock;
- Shallow water Georges Bank-southern New England: yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin;
- Deepwater Gulf of Maine-Georges Bank: white hake, American plaice, witch flounder, thorny skate; and
- Northeast Peak/Gulf of Maine-Georges Bank Transition: Atlantic cod, haddock, pollock.

6.1.2 Georges Bank

Georges Bank is a shallow (10 to 492 ft. [3 to 150 m depth]), elongated ((100 miles [mi] (161 kilometer [km] wide) by 20 mi (322 km long)) extension of the continental shelf that was formed during the Wisconsinian glacial episode (Figure 2). It has a steep slope on its northern edge, a broad, flat, gently sloping southern flank, and steep submarine canyons on its eastern and southeastern edges. It has highly productive, well-mixed waters and strong currents. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. Erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents may reduce the amount of sand and cause an overall coarsening of the bottom sediments (Valentine & Lough 1991).

Bottom topography on eastern Georges Bank consists of linear ridges in the western shoal areas; a relatively smooth, gently dipping seafloor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement; and steeper and smoother topography incised by submarine canyons on the southeastern margin. The central region of Georges Bank is shallow, and the bottom has shoals and troughs, with sand dunes superimposed within. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of Georges Bank. Currents in these areas are strongest where water depth is shallower than 164 ft. (50 m). Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm- generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity.

Oceanographic frontal systems separate the water masses of the Gulf of Maine and Georges Bank from oceanic waters south of Georges Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities. These differences influence productivity and may influence fish abundance and distribution.

Georges Bank has historically had high levels of both primary productivity and fish production. The most common groups of benthic invertebrates on Georges Bank in terms of numbers collected were amphipod crustaceans and annelid worms, while sand dollars and bivalves dominated the overall biomass (Theroux and Wigley 1998). Using the same database, Theroux and Grosslein (1987) identified four macrobenthic invertebrate assemblages that occur on similar habitat type:

[3] Other species were listed as found in these assemblages, but only the species common to both studies are listed.

1. The Western Basin assemblage is found in comparatively deep water (492 to 656 ft. [150 to 200 m]) with relatively slow currents and fine bottom sediments of silt, clay, and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers.
2. The Northeast Peak assemblage is found in variable depths and current strength and includes coarse sediments, consisting mainly of gravel and coarse sand with interspersed boulders, cobbles, and pebbles. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and tubiferous annelids) or free-living (brittle stars, crustaceans, and polychaetes), with a characteristic absence of burrowing forms.
3. The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of Georges Bank in depths less than 328 ft. (100 m). Medium-grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large with burrowing or motile habits. Sand dollars are most characteristic of this assemblage.
4. The Southern Georges Bank assemblage is found on the southern and southwestern flanks at depths from 262 to 656 ft. (80 to 200 m), where fine-grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids, and starfish.

Common demersal fish species in Georges Bank are offshore hake, blackbelly rosefish, Gulf Stream flounder, silver hake, red hake, goosefish (monkfish), Atlantic cod, haddock, pollock, yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin, white hake, American plaice, witch flounder, and thorny skate.

6.1.3 Southern New England/Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 2). The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. It generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight consists of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to between 62 to 124 ft. (100 and 200 km) offshore where it transforms to the slope (328 to 656 ft. [100 to 200 m water depth]) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson et al. 2004). Like the rest of the continental shelf, sea level fluctuations during past ice ages largely shaped the topography of the Mid-Atlantic Bight. Since that time, currents and waves have modified this basic structure.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of sand-shell and sand-gravel. Silty sand, silt, and clay predominate on the slope. Permanent sand ridges occur in groups with heights of about 33 ft. (10 m), lengths of 6 to 31 mi (10 to 50 km), and spacing of 1 mi (2 km). The sand ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Sand waves are usually found in patches of 5 to 10 with heights of about 7 ft. (2 m), lengths of 164 to 328 ft. (50 to 100 m), and 0.6 to 1 mi (1 to 2 km) between patches. Sand waves are temporary features that form and re-form in different locations. They usually occur on the inner shelf, especially in areas like Nantucket Shoals where there are strong bottom currents. Because tidal currents southwest of Nantucket Shoals and southeast of Long Island and Rhode Island slow significantly, there is a large mud patch on the seafloor where silts and clays settle out.

Artificial reefs are another important Mid-Atlantic Bight habitat. Artificial reefs formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle & Zetlin 2000). In general, reefs are important for attachment sites, shelter, and food for many species. In addition, fish predators, such as tunas, may be drawn by prey aggregations or may be behaviorally attracted to the reef structure. Estuarine reefs, such as blue mussel beds or oyster reefs, are dominated by epibenthic organisms, as well as crabs, lobsters, and sea stars. These reefs are hosts to a multitude of fish, including gobies, spot, bass (black sea and striped), perch, toadfish, and croaker. Coastal reefs consist of either exposed rock, wrecks, kelp, or other hard material. Boring mollusks, algae, sponges, anemones, hydroids, and coral generally dominate these coastal reefs. These reef types also host lobsters, crabs, sea stars, and urchins, as well as a multitude of fish, including; black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black grouper, smooth dogfish, and summer flounder. These epibenthic organisms and fish assemblages are similar to the reefs farther offshore, which generally consist of rocks and boulders, wrecks, and other types of artificial reefs. There is less information available for reefs on the outer shelf, but the fish species associated with these reefs include tilefish, white hake, and conger eel.

In terms of numbers, amphipod crustaceans and bivalve mollusks dominate the benthic inhabitants of this primarily sandy environment. Mollusks (70%) dominate the biomass (Theroux and Wigley 1998). Pratt (1973) identified three broad faunal zones related to water depth and sediment type:

1. The “sand fauna” zone is dominated by polychaetes and was defined for sandy sediments (1 percent or less silt) that are at least occasionally disturbed by waves, from shore out to a depth of about 164 ft. (50 m).
2. The “silty sand fauna” zone is dominated by amphipods and polychaetes and occurs immediately offshore from the sand fauna zone, in stable sands containing a small amount of silt and organic material.
3. Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley supporting the “silt-clay fauna.”

While substrate is the primary factor influencing demersal species distribution in the Gulf of Maine and Georges Bank, latitude and water depth are the primary influence in the Mid-Atlantic Bight area.

Colvocoresses and Musick (1984) identified the following assemblages in the Mid-Atlantic sub region during spring and fall.[4]

- Northern (boreal) portions: hake (white, silver, red), goosefish (monkfish), longhorn sculpin, winter flounder, little skate, and spiny dogfish;
- Warm temperate portions: black sea bass, summer flounder, butterfish, scup, spotted hake, and northern searobin;
- Water of the inner shelf: windowpane flounder;
- Water of the outer shelf: fourspot flounder; and
- Water of the continental slope: shortnose greeneye, offshore hake, blackbelly rosefish, and white hake.

[4] Other species were listed as found in these assemblages, but only the species common to both spring and fall seasons are listed.

6.1.4 Habitat requirements of groundfish (focus on demersal life stages)

Habitats provide living things with the basic life requirements of nourishment and shelter. This ultimately provides for both individual and population growth. The quantity and quality of available habitat influences the fishery resources of a region. Depth, temperature, substrate, circulation, salinity, light, dissolved oxygen, and nutrient supply are important parameters of a given habitat. These parameters determine the type and level of resource population that the habitat supports. Table 3 briefly summarizes the habitat requirements for each of the large-mesh groundfish species/stocks managed by the Northeast Multispecies FMP. Information for this table was extracted from the original Northeast Multispecies FMP and profiles available from NMFS. EFH information for egg, juvenile, and adult life stages for these species was compiled from Stevenson et al. 2004 (Table 3). Note that EFH for the egg stage was included for species that have a demersal egg stage (winter flounder and ocean pout); all other species' eggs are found either in the surface waters, throughout the water column, or are retained inside the parent until larvae hatch. The egg habitats of these species are therefore not generally subject to interaction with gear and are not listed in Table 15.

Table 15 – Summary of Geographic Distribution, Food Sources, Essential Fish Habitat Features and Commercial Gear used to Catch Each Species in the Northeast Multispecies Fishery Management Unit

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
Atlantic Cod	Gulf of Maine, Georges Bank and southward	Omnivorous (invertebrates and fish)	(J): 82-245 ft. (25-75 m) (A): 33-492 ft. (10-150 m)	(J): Cobble or gravel bottom substrates (A): Rocks, pebbles, or gravel bottom substrate	Otter trawl, bottom longlines, gillnets
Haddock	Southwestern Gulf of Maine and shallow waters of Georges Bank	Benthic feeders (amphipods, polychaetes, echinoderms), bivalves, and some fish	(J): 115-328 ft. (35-100 m) (A): 131-492 ft. (40-150 m)	(J): Pebble and gravel bottom substrates (A): Broken ground, pebbles, smooth hard sand, smooth areas between rocky patches	Otter trawl, bottom longlines, gillnets
Acadian redfish	Gulf of Maine, deep portions of Georges Bank and Great South Channel	Crustaceans	(J): 82-1,312 ft. (25-400 m) (A): 164-1,148 ft. (50-350 m)	(J): Bottom habitats with a substrate of silt, mud or hard bottom (A): Same as for (J)	Otter trawl
Pollock	Gulf of Maine, extends to Georges Bank, and the northern part of Mid-Atlantic Bight	Juvenile feed on crustaceans, adults also feed on fish and mollusks	(J): 0-820 ft. (0-250 m) (A): 49-1,198 ft. (5-365 m)	(J): Bottom habitats with aquatic vegetation or substrate of sand, mud or rocks (A): Hard bottom habitats including artificial reefs	Otter trawl, gillnets
Atlantic Halibut	Gulf of Maine, Georges Bank	Juveniles feed on annelid worms and crustaceans, adults mostly feed on fish	(J): 66-197 ft. (20-60 m) (A): 328-2,297 ft. (100-700 m)	(J): Bottom habitat with a substrate of sand, gravel or clay (A): Same as for (J)	Otter trawl bottom longlines
Ocean Pout	Gulf of Maine, Cape Cod Bay, Georges Bank, Southern New England, Middle Atlantic south to Delaware Bay	Juveniles feed on amphipods and polychaetes. Adults feed mostly on echinoderms, mollusks &	(E): <164 ft. (<50 m)	(E): Bottom habitats, generally hard bottom sheltered nests, holes or crevices where juveniles are	Otter trawl

		crustaceans	(L): <164 ft. (<50 m) (J): 262 ft. (<80 m) (A): 361 ft. (<110 m)	guarded (L): Hard bottom nesting areas (J): Bottom habitat, often smooth areas near rocks or algae (A): Bottom habitats; dig depressions in soft sediments	
White hake	Gulf of Maine, Georges Bank, Southern New England	Juveniles feed mostly on polychaetes and crustaceans; adults feed mostly on crustaceans, squids and fish	(J): 16-738 ft. (5-225 m) (A): 16-1,066 ft. (5-325 m)	(J): Bottom habitat with seagrass beds or substrate of mud or fine-grained sand (A): Bottom habitats with substrate of mud or find grained sand	Otter trawl, gillnets
Yellowtail flounder	Gulf of Maine, Southern New England, Georges Bank	Amphipods and polychaetes	(J): 66-164 ft. (20-50 m) (A): 66-164 ft. (20-50 m)	(J): Bottom habitats with substrate of sand or sand and mud (A): Same as for (J)	Otter trawl
American plaice	Gulf of Maine, Georges Bank	Polychaetes, crustaceans, mollusks, echinoderms	(J): 148-492 ft. (45-150 m) (A): 148-574 ft. (45-175 m)	(J): Bottom habitats with fine grained sediments or a substrate of sand or gravel (A): Same as for (J)	Otter trawl
Witch flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/Southern New England	Mostly polychaetes (worms), echinoderms	(J): 164-1,476 ft. (50-450 m) (A): 82-984 ft. (25-300 m)	(J): Bottom habitats with fine grained substrate (A): Same as for (J)	Otter trawl
Winter flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/Southern New England	Polychaetes, crustaceans	(E): 16 ft. (<5 m) (J): 0.3-32 ft. (0.1-10 m) (3-164 age 1+) (1-50 m) (A): 3.2-328 ft. (1-100 m)	(J): Bottom habitats with a substrate of mud or fine grained sand (A): Bottom habitats including estuaries with substrates of mud, sand, gravel	Otter trawl, gillnets

Atlantic wolffish	Gulf of Maine & Georges Bank	Mollusks, brittle stars, crabs, and sea urchins	(J): 131, 2-787.4 ft. (40-240 m) (A): 131.2-787.4 ft. (40-240 m)	(J): Rocky bottom and coarse sediments (A): Same as for (J)	Otter trawl, bottom longlines, and gillnets
Windowpane flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/Southern New England	Juveniles mostly crustaceans; adults feed on crustaceans and fish	(J): 3.2-328 ft. (1-100 m) (A): 3.2-574 ft. (1-75 m)	(J): Bottom habitats with substrate of mud or fine grained sand (A): Same as for (J)	Otter trawl

6.1.5 Essential Fish Habitat (EFH) Designations

The Sustainable Fisheries Act defines EFH as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The proposed action could potentially affect EFH for benthic life stages of species that are managed under the Northeast Multispecies FMP; 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 surf clam and ocean quahog FMPs. 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. Table 15 summarizes the EFH descriptions of the general substrate or bottom types for all the benthic life stages of the species managed under these FMPs. Full descriptions and maps of EFH for each species and life stage are available on the NMFS Northeast Region website at http://www.nero.noaa.gov/hcd/index2a.htm. In general, EFH for species and life stages that rely on the seafloor for shelter (e.g., from predators), reproduction, or food is vulnerable to disturbance by bottom tending gear. The most vulnerable habitat is more likely to be hard or rough bottom with attached epifauna.

6.1.6 Gear Types and Interaction with Habitat

A variety of gears are used to prosecute the multispecies fishery (Table 16) Groundfish vessels fish for target species with a number of gear types: trawl, gillnet, fish pots/traps, and hook and line gear (including jigs, handline, and non-automated demersal longlines). This section discusses the characteristics of each of the proposed gear types as well as the typical impacts to the physical habitat associated with each of these gear types.

6.1.6.1 Gear Types

Table 16 - Description of the gear types used by the multispecies fishery

	Trawl	Sink/ Anchor Gillnets	Bottom Longlines	Hook and Line
Total Length	Varies	295 ft. (90 m) long per net	~1,476 ft. (451 m)	Varies by target species
Lines	N/A	Leadline and floatline with webbing (mesh) connecting	Mainline is parachute cord. Gangions (lines from mainline to hooks) are 15 inches (38 cm) long, 3 to 6 inches (8 to 15 cm) apart, and made of shrimp twine	One to several with mechanical line fishing
Nets	Rope or large-mesh size, depends upon target species	Monofilament, mesh size depends on the target species (groundfish nets minimum mesh size of 6.5 inches [16.5 cm])	No nets, but 12/0 circle hooks are required	No nets, but single to multiple hooks, “umbrella rigs”
Anchoring	N/A	22 lbs (10 kg) Danforth-style anchors are required at each end of the net string	20-24 lbs (9-11 kg) anchors, anchored at each end, using pieces of railroad track, sash weights, or Danforth anchors, depending on currents	No anchoring, but sinkers used (stones, lead)
Frequency/ Use Duration	Tows last for several hours	Frequency of trending changes from daily (when targeting groundfish) to semi-weekly (when targeting monkfish and skate)	Usually set for a few hours at a time	Depends upon cast/target species

6.1.6.1.1 Trawl Gear

Trawls are classified by their function, bag construction, or method of maintaining the mouth opening. Function may be defined by the part of the water column where the trawl operates (e.g., bottom) or by the species that it targets (Hayes 1983). Mid-water trawls are designed to catch pelagic species in the water column and do not normally contact the bottom; however, mid-water trawls are prohibited in the Northeast multispecies fishery. Bottom trawls are designed to be towed along the seafloor and to catch a variety of demersal fish and invertebrate species.

Fishermen use the mid-water trawl to capture pelagic species throughout the water column. The mouth of the net typically ranges from 361 to 558 ft. (110 m to 170 m) and requires the use of large vessels (Sainsbury 1996). Successful mid-water trawling requires the effective use of various electronic aids to find the fish and maneuver the vessel while fishing (Sainsbury 1996). Tows typically last for several hours and catches are large. Fishermen usually remove the fish from the net while it remains in the water alongside the vessel by means of a suction pump. Some fishermen remove the fish in the net by repeatedly lifting the codend aboard the vessel until the entire catch is in the hold.

Bottom otter trawls account for nearly all commercial bottom trawling activity. There is a wide range of otter trawl types used in the Northeast due to the diversity of fisheries and bottom types encountered in the region (Northeast Region Essential Fish Habitat Steering Committee 2002). The specific gear design used is often a result of the target species (whether found on or off the bottom) as well as the composition of the bottom (smooth versus rough and soft versus hard). A number of different types of bottom otter trawl used in the Northeast are specifically designed to catch certain species of fish, on specific bottom types, and at particular times of year. Fishermen tow bottom trawls at a variety of speeds, but average about 5.6 km/hour (3 knots). Several federal FMPs manage the use of this gear. Bottom trawling is also subject to a variety of state regulations throughout the region.

A flatfish trawl is a type of bottom otter trawl designed with a low net opening between the headrope and the footrope and more ground rigging on the sweep. This type of trawl is designed so that the sweep follows the contours of the bottom, to get fish like flounders. Flounders lie in contact with the seafloor and flatfish trawls look to get flounder up off the bottom and into the net. It is used on smooth mud and sand bottoms. A high-rise or fly net with larger mesh has a wide net opening and is used to catch demersal fish that tend to rise higher off the bottom than flatfish (Northeast Region Essential Fish Habitat Steering Committee 2002).

Bottom otter trawls are rigged with rockhopper gear for use on "hard" bottom (i.e., gravel or rocky bottom), mud or sand bottom with occasional boulders. This type of gear seeks to sweep over irregularities in the bottom without damaging the net. The sweep in trawls rigged for fishing on smooth bottoms looks to herd fish into the path of the net (Mirarchi 1998).

The raised-footrope trawl was designed to provide vessels with a means of continuing to fish for small-mesh species without catching groundfish. Raised-footrope trawls fish about 1.6 to 2.0 ft. (0.5 to 0.6 m) 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 seafloor than the traditional cookie sweep (Carr and Milliken 1998).

The haddock separator trawl and Ruhle trawl (bottom trawls), are used to minimize the catch of cod. The design of these gears considers the behavior of fish in response to gear. A haddock separator trawl is a groundfish trawl modified to a vertically oriented trouser trawl configuration. It has two extensions arranged one over the other. A codend is attached to the upper extension, and the bottom extension is left open with no codend attached. A horizontal large mesh separating panel constructed with a minimum of 6-inch diamond mesh must be installed between the selvedges joining the upper and lower panels [648.85(a)(3)(iii)(A)]. Haddock generally swim to the upper part of a net and cod swim to the lower part of the net. By inserting a mesh panel in the net, and using two codends, the net effectively divides the catch. The cod can escape if the codend on the lower part of the net is left open (NEFMC 2003). Overall, the haddock separator trawl has had mixed results in commercial fishing operations. The expected ratios of haddock to cod have not been realized. Catches of other demersal species, such as flounders, skates, and monkfish, have also been higher than expected. However, the separator trawl has reduced catches of these species compared to normal fishing practices (NEFMC 2009a).

The Ruhle trawl (previously known as the haddock rope trawl or eliminator trawl) is a four-seam bottom groundfish trawl with a rockhopper. It is designed to reduce the bycatch of cod while retaining or increasing the catch of haddock and other healthy stocks [648.85(b)(6)(iv)(J)(*3*)]. NMFS approved the Ruhle trawl for use in the DAS program and in the Eastern U.S./Canada Haddock SAP on July 14, 2008 (73 FR 40186) after nearly two years of testing to determine efficacy. Experiments comparing traditional and the new trawl gear showed that the Ruhle trawl reduced bycatch of cod and flounders, while simultaneously retaining the catch of healthier stocks, primarily haddock. The large, 8-foot mesh in the forward end (the wings) of the Ruhle trawl net allows cod and other fish to escape because of their body shapes and unique behavior around the netting (NOAA 2009).

6.1.6.1.2 Gillnet Gear

Sectors would also use individual sink/anchor gillnets which are about 295 ft. (90 m) long. They are usually fished as a series of 5 to 15 nets attached end-to-end. A vast majority of “strings” consist of 10 gillnets. Gillnets typically have three components: the leadline, webbing, and floatline. In New England, leadlines are approximately 66 lbs/net (30 kilogram (kg)/net). Webs are monofilament, with the mesh size depending on the species of interest. Nets are anchored at each end using materials such as pieces of railroad track, sash weights, or Danforth anchors, depending on currents. Anchors and leadlines have the most contact with the bottom. For New England groundfish, frequency of tending gillnets ranges from daily to semiweekly (Northeast Region Essential Fish Habitat Steering Committee 2002).

A bottom gillnet is a large wall of netting equipped with floats at the top and lead weights along the bottom. Bottom gillnets are anchored or staked in position. Fish are caught while trying to pass through the net mesh. Gillnets are highly selective because the species and sizes of fish caught are dependent on the mesh size of the net. The meshes of individual gillnets are uniform in size and shape, hence highly selective for a particular size of fish (Jennings et al. 2001). Bottom gillnets are fished in two different ways, as "standup" and "tiedown" nets (Williamson 1998). Standup nets typically catch Atlantic cod, haddock, pollock, and hake and are soaked (duration of time the gear is set) for 12 to 24 hours. Tiedown nets are set with the floatline tied to the leadline at 6-ft (1.8 m) intervals, so that the floatline is close to the bottom and the net forms a limp bag between each tie. They are left in the water for 3-4 days, and are used to catch flounders and monkfish.

6.1.6.1.3 Fish Traps/Pots

Some sectors would use fish traps/pots. This EA assumes these traps/pots are similar to lobster pots. Lobster pots are typically rectangular and consist of two sections, the chamber and the parlor. The chamber has an entrance on both sides of the pot and usually contains the bait. Lobsters enter the parlor via a tunnel (Everhart and Youngs 1981). Escape vents in both areas of the pot minimize the retention of sub-legal sized lobsters (DeAlteris 1998).

Lobster pots are fished as either a single pot per buoy (although two pots per buoy are used in Cape Cod Bay, and three pots per buoy in Maine waters), or a “trawl” or line with up to one hundred pots. The Northeast Fishery Science Center (NEFSC 2002) provides the following important features of lobster pots and their use:

- About 95 percent of lobster pots are made of plastic-coated wire.
- Floating mainlines may be up to 25 ft. (8 m) off bottom; sinking groundlines are used where entanglements with marine mammals are a concern.
- Soak time depends on season and location - usually 1 to 3 days in inshore waters in warm weather to weeks in colder waters.
- Offshore pots are larger [more than 4 ft. (1 m) long] and heavier (~ 100 lbs or 45 kg), with an average of about 40 pots/trawl and 44 trawls/vessel. They have a floating mainline and are usually deployed for a week at a time.

6.1.6.1.4 Hook and Line Gear

6.1.6.1.4.1 Hand Lines/Rod and Reel

Sectors would also use handlines. The simplest form of hook and line fishing is the hand line. It may be fished using a rod and reel or simply “by hand.” The gear consists of a line, sinker (weight), gangion, and at least one hook. The line is typically stored on a small spool and rack and varies in length. The sinkers vary from stones to cast lead. The hooks can vary from single to multiple arrangements in “umbrella” rigs. Fishermen use an attraction device such as natural bait or an artificial lure with the hook. Handlines can be carried by currents until retrieved or fished in such a manner as to hit bottom and bounce (Stevenson et al.

2004). Fishermen use hand lines as well as rods and reels in the Northeast Region to catch a variety of demersal species.

6.1.6.1.4.2 Mechanized Line Fishing

Mechanized line-hauling systems use electrical or hydraulic power to work the lines on the spools. They allow smaller fishing crews to work more lines. Fishermen mount the reels, also called "bandits," on the vessel bulwarks with the mainline wound around a spool. They take the line from the spool over a block at the end of a flexible arm. Each line may have a number of branches and baited hooks.

Fishermen use jigging machines to jerk a line with several unbaited hooks up in the water to attract a fish. Fishermen generally use fish jigging machine lines in waters up to 1,970 ft. (600 m) deep. Hooks and sinkers can contact the bottom. Depending upon the way the gear is used, it may catch a variety of demersal species.

6.1.6.1.4.3 Bottom Longlines

Sectors would also use bottom longlines. This gear consists of a long length of line to which short lengths of line ("gangions") carrying baited hooks are attached. Longlining is undertaken for a wide range of bottom species. Bottom longlines typically have up to six individual longlines strung together for a total length of more than 1,476 ft. (450 m) and are deployed with 20 to 24 lbs (9 to 11 kg) anchors. The mainline is a parachute cord. Gangions are typically 16 in (40 cm) long and 3 to 6 in (1 to 1.8 m) apart and are made of shrimp twine. These bottom longlines are usually set for a few hours at a time (Northeast Region Essential Fish Habitat Steering Committee 2002).

All hooks must be 12/0 circle hooks. A "circle hook is a hook with the point turned back towards the shank. The barbed end of the hook is displaced (offset) relative to the parallel plane of the eyed-end or shank of the hook when laid on its side. Habitat impacts from bottom long lines are negligible.

6.1.6.2 Gear Interaction with Habitat

Commercial fishing in the region has historically used trawls, gillnets, and bottom longline gear. Fishermen have intensively used trawls throughout the region for decades and currently account for the majority of commercial fishing activity in the multispecies fishery off New England.

The most recent Multispecies FMP action to include a comprehensive evaluation of gear effects on habitat was Amendment 13 (NEFMC 2003). Amendment 13 described the general effects of bottom trawls on benthic marine habitats. This analysis primarily used an advisory report prepared for the International Council for the Exploration of the Seas (ICES 2000). This report identified a number of possible effects of bottom otter trawls on benthic habitats and is based on scientific findings summarized in Lindeboom and de Groot (1998). The report focuses on the Irish Sea and North Sea, but assesses effects in other areas. The report generally concluded that: (1) low-energy environments are more affected by bottom trawling; and (2) bottom trawling affects the potential for habitat recovery (i.e., after trawling ceases, benthic communities and habitats may not always return to their original pre- impacted state). The report also concluded the following about direct habitat effects:

- Loss or dispersal of physical features such as peat banks or boulder reefs results in <u>changes that are always permanent</u> and lead to an overall change in habitat diversity. This in turn leads to the local loss of species and species assemblages dependent on such features;

- Loss of structure-forming organisms such as bryozoans, tube-dwelling polychaetes, hydroids, seapens, sponges, mussel beds, and oyster beds results in changes that may be permanent leading to an overall change in habitat diversity. This in turn leads to the local loss of species and species assemblages dependent on such biogenic features;
- Changes are not likely to be permanent due to a reduction in complexity caused by redistributing and mixing of surface sediments and the degradation of habitat and biogenic features, leading to a decrease in the physical patchiness of the seafloor; and
- Changes are not likely to be permanent due to alteration of the detailed physical features of the seafloor by reshaping seabed features such as sand ripples or damaging burrows and associated structures that provide important habitats for smaller animals and can be used by fish to reduce their energy requirements.

The Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (NRC 2002) also prepared evaluation of the habitat effects of trawling and dredging that was evaluated during Amendment 13. Trawl gears evaluated included bottom otter trawls. This report identified four general conclusions regarding the types of habitat modifications caused by trawls:

- Trawling reduces habitat complexity;
- Repeated trawling results in discernible changes in benthic communities;
- Bottom trawling reduces the productivity of benthic habitats; and
- Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance.

The report from a "Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern U.S." sponsored by the NEFMC and MAFMC (NEFSC 2002) provides additional information for various Northeast region gear types. A panel of fishing industry members and experts in the fields of benthic ecology, fishery ecology, geology, and fishing gear technology convened for the purpose of assisting the NEFMC, MAFMC, and NMFS with:

- Evaluating the existing scientific research on the effects of fishing gear on benthic habitats;
- Determining the degree of impact from various gear types on benthic habitats in the Northeast;
- Specifying the type of evidence that is available to support the conclusions made about the degree of impact;
- Ranking the relative importance of gear impacts to various habitat types; and
- Providing recommendations on measures to minimize those adverse impacts.

The panel was provided with a summary of available research studies that summarized information relating to the effects of bottom otter trawls, bottom gillnets, and bottom longlines. Relying on this information plus professional judgment, the panel identified the effects and the degree of impact of these gears on mud, sand, and gravel/rock habitats.

The panel's report provides additional information on the recovery times for each type of impact for each gear type in mud, sand, and gravel habitats ("gravel" includes other hard-bottom habitats). This information made it possible for the panel to rank these three substrates in terms of their vulnerability to the effects of bottom trawling. The report also notes that other factors such as frequency of disturbance from fishing and from natural events are also important. In general, the panel determined that impacts from trawling are greater in gravel/rock habitats with attached epifauna. The panel ranked impacts to biological structure higher than impacts to physical structure. Effects of trawls on major physical features in mud (deep water clay-bottom habitats) and gravel bottom were described as permanent. Impacts to biological and physical structure were given recovery times of months to years in mud and gravel. Impacts of trawling on physical structure in sand were of shorter duration (days to months) given the exposure of most continental shelf sand habitats to strong bottom currents and/or frequent storms.

According to the panel, impacts of sink gillnets and bottom longlines on sand and gravel habitats would result in low degree impacts (NEFSC 2002). Duration of impacts to physical structures from these gear types would be expected to last days to months on soft mud, but could be permanent on hard bottom clay structures along the continental slope. Impacts to mud would be caused by gillnet lead lines and anchors. Physical habitat impacts from sink gillnets and bottom longlines on sand would not be expected.

Amendment 13 also summarized the contents of a second expert panel report, produced by the Pew Charitable Trusts and entitled "Shifting Gears: Addressing the Collateral Impacts of Fishing Methods in U.S. Waters" (Morgan & Chuenpagdee 2003). This group evaluated the habitat effects of ten different commercial fishing gears used in U.S. waters. The report concluded that bottom trawls have relatively high habitat impacts; bottom gillnets and pots and traps have low to medium impacts; and bottom longlines have low impacts. As in the International Council for the Exploration of the Seas and National Research Council reports, the panel did not evaluate individual types of trawls and dredges. The impacts of bottom gillnets, traps, and bottom longlines were limited to warm or shallow water environments with rooted aquatic vegetation or "live bottom" environments (e.g., coral reefs).

Going beyond Amendment 13 analyses, one purpose of the ongoing Omnibus Essential Fish Habitat Amendment 2 (OA2) is to evaluate existing habitat management areas and develop new habitat management areas. To assist with this effort, the Habitat PDT developed an analytical approach to characterize and map habitats and to assess the extent to which different habitat types are vulnerable to different types of fishing activities. This body of work, termed the Swept Area Seabed Impact approach, includes a quantitative, spatially-referenced model that overlays fishing activities on habitat through time to estimate both potential and realized adverse effects to EFH. The approach is detailed in this document, available on the Council webpage: http://www.nefmc.org/habitat/sasi_info/110121_SASI_Document.pdf.

The spatial domain of the SASI model is US Federal waters (between 3-200 nm offshore) from Cape Hatteras to the US-Canada border. Within this region, habitats were defined based on natural disturbance regime and dominant substrate. Understanding natural disturbance regime is important because it may mask or interact with human-caused disturbance. Energy at the seabed was inferred from an oceanography model (flow) and a coastal relief model (depth) and was binned into areas of high or low energy. Substrate type is an important determinant of habitat because it influences the distribution of managed species, structure-forming epifauna, and prey species by providing spatially discrete resources such as media for burrowing organisms, attachment points for vertical epifauna, etc. The dominant substrate map was composed of thousands of visual and grab sample observations, with grid size based on the spacing of the observations. The underlying spatial resolution of the substrate grid is much higher on Georges Bank and on the tops of banks and ledges in the Gulf of Maine than it is in deeper waters. For this reason, additional data sources were used during habitat management area development.

One of the outputs of the model is habitat vulnerability, which is related in part to the characteristics of the habitat itself, and part to the quality of the impact. Because of a general need for attachment sites, epifauna that provided a sheltering function for managed species tend to be more diverse and abundant in habitats containing larger grain sized substrates. Structurally complex and/or long-lived epifaunal species are more susceptible to gear damage and slower to recover. Recovery rates were assumed to be retarded in low energy areas, such that overall vulnerability (susceptibility + recovery) of low energy areas is greater than high energy areas, other factors being equal. When combined with the underlying substrate and energy distribution, the susceptibility and recovery scores assigned to the inferred mix of epifaunal and geological features generated a highly patchy vulnerability map. Locations where high proportions by area map out as cobble-dominated or cobble- and boulder-dominated tended to show higher vulnerability scores. Although the literature on fixed gear impacts is relatively sparse, it was estimated that mobile gears have a greater per-unit area swept impact than fixed gears, so mobile gear vulnerability scores are the focus here in the exemption area analyses below.

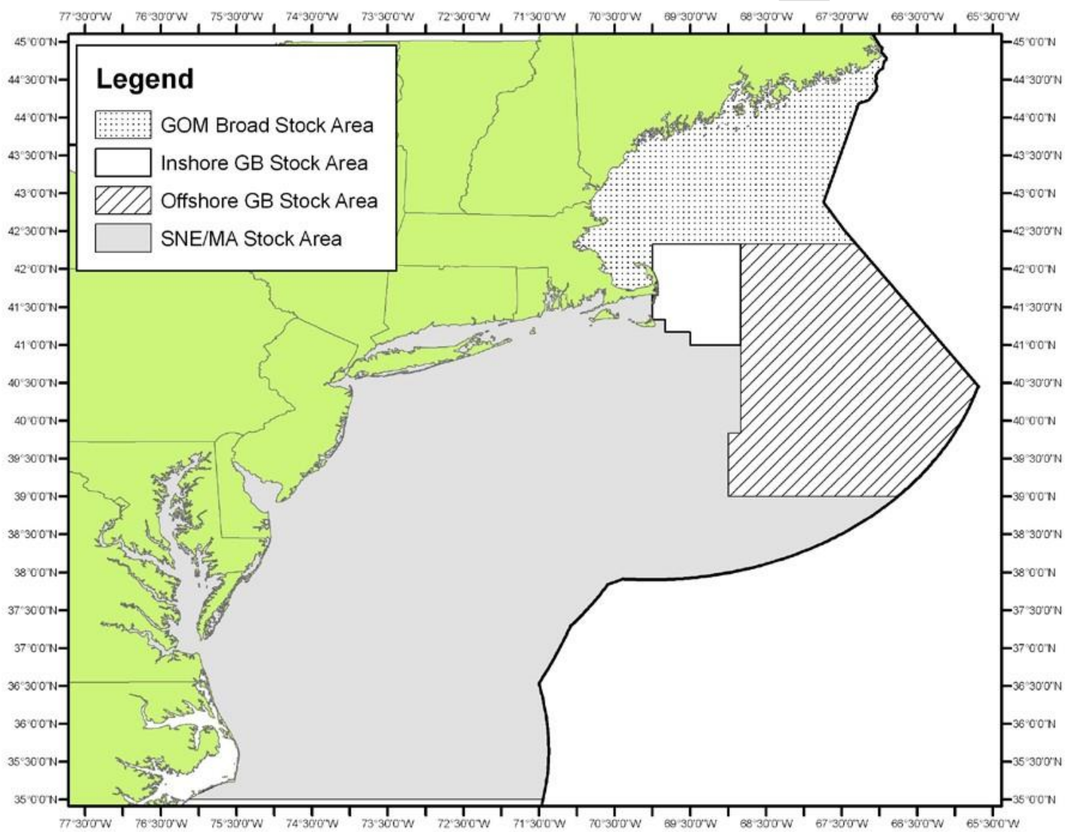
6.2 Groundfish Species

This section describes the life history and stock population status for each allocated fish stock the sectors harvest under the Northeast Multispecies FMP. Figure 16 identifies the four broad stock areas used in the fishery (Figure 7). Please refer to the species habitat associations described in Section 6.1.6 for information on the interactions between gear and species. Section 6.1 also provides a comparison of depth-related demersal fish assemblages of Georges Bank and the Gulf of Maine. This section concludes with an analysis of the interaction between the gear types the sectors intend to use (as described in Section 6.1.6.1) and allocated target species. The following discussions have been adapted from the GARM III report (NEFSC 2008) and the EFH Source Documents: Life History and Habitat Characteristics are assessable via the NEFSC website at http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

6.2.1 Species and Stock Status Descriptions

The allocated target stocks for the sectors are GOM Cod, GB Cod, GOM Haddock, GB Haddock, American Plaice, Witch Flounder, GOM Winter Flounder, GB Winter Flounder, Cape Cod/GOM Yellowtail Flounder, GB Yellowtail Flounder, SNE/MA Yellowtail Flounder, Redfish, Pollock and White Hake.

Figure 7 - Broad stock areas as defined in Amendment 16



Spiny dogfish, skates, and monkfish are considered in this EA as “non-allocated target species and bycatch” in Sections 6.3. The Northeast Multispecies FMP does not allocate these species. They and are managed under their own FMPs.

The Northeast Multispecies FMP also manages Atlantic halibut, ocean pout, windowpane flounder, and SNE/MA winter flounder. However, sectors do not receive an allocation of these species. Sector and common pool vessels cannot land wolffish, ocean pout, windowpane flounder, and inshore GB and SNE/MA winter flounder, but can retain one halibut per trip. Wolffish are provisionally managed under the Northeast Multispecies FMP Amendment 16 to the Northeast Multispecies FMP (NEFMC 2009) addresses these species. These species are discussed in Section 6.3.

6.2.1.1 Gulf of Maine Cod

Life History: The Atlantic cod, *Gadus morhua*, is a demersal gadoid species found on both sides of the North Atlantic. In the western North Atlantic, cod occur from Greenland to North Carolina. In U.S. waters, cod are assessed and managed as two stocks: Gulf of Maine and Georges Bank. GOM cod attain sexual maturity at a later age than GB cod due to differences in growth rates between the two stocks. The greatest concentrations of cod off the Northeast coast of the U.S. are on rough bottoms in waters between 33 and 492 ft. (10 and 150 m) and at temperatures between 32 and 50°F (0 and 10°C). Spawning occurs year-round, near the ocean bottom, with a peak in winter and spring. Peak spawning corresponds to water temperatures between 41 and 45°F (5 and 7°C). It is delayed until spring when winters are severe and peaks in winter when mild. Eggs are pelagic, buoyant, spherical, and transparent. They drift for 2 to 3 weeks before hatching. The larvae are pelagic for about three months until reaching 1.6 to 2.3 in (4 to 6 cm), at which point they descend to the seafloor. Most remain on the bottom after this descent, and there is no evidence of a subsequent diel, vertical migration. Adults tend to move in schools, usually near the bottom, but also occur in the water column.

Population Status: The inshore GOM stock appears to be relatively distinct from the offshore cod stocks on the banks of the Scotian Shelf and Georges Bank based on tagging studies. GOM cod spawning stock biomass has increased since the late 1990's from 12,236 ton (11,100 metric tons [mt]) in 1997 to 37,479 ton (34,000 mt) in 2007. However, the stock remains low relative to historic levels and is subject to a formal stock rebuilding plan. The 2013 biomass estimate, the most recent estimate available, was 3-4% percent of the biomass rebuilding target. Currently, the GOM cod stock is overfished and overfishing is occurring.

6.2.1.2 Georges Bank Cod

Life History: The GB cod stock, *Gadus morhua*, is the most southerly cod stock in the world. The greatest concentrations off the Northeast coast of the U.S. are on rough bottoms in waters between 33 and 492 ft. (10 and 150 m) and at temperatures between 32 and 50° F (0 and 10°C). Spawning occurs year-round, near the ocean bottom, with a peak in winter and spring. Peak spawning corresponds to water temperatures between 41 and 45°F (5 and 7°C). It is delayed until spring when winters are severe and peaks in winter when mild. Eggs are pelagic, buoyant, spherical, and transparent. They drift for 2 to 3 weeks before hatching. The larvae are pelagic for about 3 months until reaching 1.6 to 2.3 in (4 to 6 cm), at which point they descend to the seafloor. Most remain on the bottom after this descent, and there is no evidence of a subsequent diel, vertical migration. Adults tend to move in schools, usually near the bottom, but also occur in the water column.

Population Status: GB cod are a transboundary stock harvested by both the U.S. and Canadian fishing fleets. The GB cod stock is overfished and overfishing is occurring.

6.2.1.3 Gulf of Maine Haddock

Life History: The GOM haddock, *Melanogrammus aeglefinus*, is a commercially-exploited groundfish found in the North Atlantic Ocean. This demersal gadoid species occurs from Cape May, New Jersey to the Strait of Belle Isle, Newfoundland in the western North Atlantic. A total of six distinct haddock stocks have been identified. Two of these haddock stocks occur in U.S. waters associated with Georges Bank and the Gulf of Maine.

Haddock are highly fecund broadcast spawners. They spawn over various substrates including rocks, gravel, smooth sand, and mud. Haddock release their eggs near the ocean bottom in batches where a courting male then fertilizes them. After fertilization, haddock eggs become buoyant and rise to the surface water layer. In the Gulf of Maine, spawning occurs from early February to May, usually peaking in February to April. Jeffreys Ledge and Stellwagen Bank are the two primary spawning sites in the Gulf of Maine. Fertilized eggs are buoyant and remain in the water column where subsequent development occurs. Larvae metamorphose into juveniles in roughly 30 to 42 days at lengths of 0.8 to 1.1 in (2 to 3 cm). Small juveniles initially live and feed in the epipelagic zone. Juveniles remain in the upper part of the water column for 3 to 5 months. Juveniles visit the ocean bottom in search of food. Juveniles settle into a demersal existence once they locate suitable bottom habitat. Haddock do not make extensive seasonal migrations. Haddock prefer deeper waters in the winter and tend to move shoreward in summer.

Population Status: The GOM haddock stock is not overfished and overfishing is not occurring.

6.2.1.4 Georges Bank Haddock

Life History: The general life history of GB haddock, *Melanogrammus aeglefinus*, is comparable to the GOM haddock as described above. On Georges Bank, spawning occurs from January to June, usually peaking from February to early-April. Georges Bank is the principal haddock spawning area in the Northeast U.S. Shelf Ecosystem. GB haddock spawning concentrates on the northeast peak of Georges Bank.

Median age and size of maturity differ slightly between the GB and GOM haddock stocks. GARM III found that the GOM fishery does not target haddock. The fleet targets mostly flatfish using large square (6.5 inch [16.5 cm]) mesh gear. This leads to reduced selectivity on haddock. The GOM haddock have lower weights at age than the GB stock and the age at 50 percent maturity was also lower for GOM haddock than GB haddock.

Population Status: The GB haddock stock is a transboundary resource co-managed with Canada. Substantial declines have recently occurred in the weights at age due to slower than average growth. This was particularly true of the 2003 year-class. This decline is affecting productivity in the short-term. The growth of subsequent year-classes is returning to the earlier rates. The stock is not overfished and overfishing is not occurring. The fishing mortality rate for this stock has been low in recent years.

6.2.1.5 American Plaice

Life History: The American plaice, *Hippoglossoides platessoides*, is an arctic-boreal to temperate-marine pleuronectid (righteye) flounder that inhabits both sides of the North Atlantic on the continental shelves of northeastern North America and northern Europe. Off the U.S. coast, American plaice are managed as a single stock in the Gulf of Maine-Georges Bank region. American plaice are batch spawners. They release eggs in batches every few days over the spawning period. Adults spawn and fertilize their eggs at or near the bottom. Buoyant eggs lack oil globules and will drift into the upper water column after release. Eggs hatch at the surface and the amount of time between fertilization and hatching varies with the water temperature. Transformation of the larvae and migration of the left eye begins when the larvae are approximately 0.8 in (20 millimeters (mm)). Dramatic physiological transformations occur during the juvenile stage. The body shape continues to change, flattening and increasing in depth from side to side. As the migration of the left eye across the top of the head to the right side reaches completion, descent towards the seafloor begins. In U.S. and Canadian waters, American plaice is a sedentary species migrating only for spawning and feeding.

Population Status: In the Gulf of Maine and Georges Bank area, the American plaice stock is not overfished and overfishing is not occurring. However, a stock assessment conducted in 2012 indicates that the stock will not rebuild by 2014, the currently specified rebuilding target date, even if no fishing is allowed on the stock in FY 2013. Because of this inadequate rebuilding progress, a revised rebuilding program is necessary and will be developed for use no later than May 1, 2014.

6.2.1.6 Witch Flounder

Life History: The witch flounder, *Glyptocephalus cynoglossus*, is a demersal flatfish distributed on both sides of the North Atlantic. In the western North Atlantic, the species ranges from Labrador southward, and closely associates with mud or sand-mud bottom. In U.S. waters, witch flounder are common throughout the Gulf of Maine, in deeper areas on and adjacent to Georges Bank, and along the shelf edge as far south as Cape Hatteras, North Carolina. NMFS manages witch flounder as a unit stock.

Spawning occurs at or near the bottom; however, the buoyant eggs rise into the water column where subsequent egg and larval development occurs. The pelagic stage of witch flounder is the longest among the species of the family *Pleuronectidae*. Descent to the bottom occurs when metamorphosis is complete, at 4 to 12 months of age. There has been a decrease in both the age and size of sexual maturity in recent years. Witch flounder spawn from March to November, with peak spawning occurring in summer. The general trend is for spawning to occur progressively later from south to north. In the Gulf of Maine-Georges Bank region, spawning occurs from April to November, and peaks from May to August. Spawning occurs in dense aggregations that are associated with areas of cold water. Witch flounder spawn at 32 and 50 °F (0 to 10^{o}C).

Population Status: Witch flounder are overfished and overfishing is occurring.

6.2.1.7 Gulf of Maine Winter Flounder

Life History: The winter flounder, *Psuedopleuronectes americanus*, is a demersal flatfish distributed in the western North Atlantic from Labrador to Georgia. Important U.S. commercial and recreational fisheries exist from the Gulf of Maine to the Mid-Atlantic Bight. NMFS manages and assesses winter flounder in U.S. waters as three stocks: Gulf of Maine, southern New England/Mid-Atlantic, and Georges Bank. Adult GOM winter flounder migrate inshore in the fall and early winter and spawn in late winter and early spring. Winter flounder spawn from winter through spring, with peak spawning occurring in Massachusetts Bay and south of Cape Cod during February and March, and somewhat later along the coast of Maine, continuing into May. After spawning, adults typically leave inshore areas when water temperatures exceed 59 °F (15^{o}C) although some remain inshore year-round. The eggs of winter flounder are demersal, adhesive, and stick together in clusters. Larvae are initially planktonic but become increasingly bottom-oriented as metamorphosis approaches. Metamorphosis is when the left eye migrates to the right side of the body and the larvae become “flounder-like”. It begins around 5 to 6 weeks after hatching, and finishes by the time the larvae are 0.3 to 0.4 in (8 to 9 mm) in length at about 8 weeks after water where individuals may grow to about 4 in (100 mm) within the first year.

Population Status: The exact status determination for GOM winter flounder is unknown. Overfishing is not occurring.

6.2.1.8 Georges Bank Winter Flounder

Life History: The life history of the GB winter flounder**,** *Psuedopleuronectes americanus,* is comparable to the GOM winter flounder life history described above.

Population Status: The stock is not overfished and not undergoing overfishing. The GB winter flounder stock is scheduled to rebuild in 2017 under a 75% probability of meeting the target SSB.

6.2.1.9 Cape Cod/Gulf of Maine Yellowtail Flounder

Life History: The yellowtail flounder, *Limanda ferruginea*, is a demersal flatfish that occurs from Labrador to Chesapeake Bay. It generally inhabits depths between 131 to 230 ft. (40 and 70 m). NMFS manages three stocks off the U.S. coast including the Cape Cod/GOM, GB, and SNE/MA stocks. Spawning occurs in the western North Atlantic from March through August at temperatures of 41 to 54 °F (5 to 12°C). Spawning takes place along continental shelf waters northwest of Cape Cod. Yellowtail flounder spawn buoyant, spherical, pelagic eggs that lack an oil globule. Pelagic larvae are brief residents in the water column with transformation to the juvenile stage occurring at 0.5 to 0.6 in (11.6 to 16 mm) standard length. There are high concentrations of adults around Cape Cod in both spring and autumn. The median age at maturity for females is 2.6 years off Cape Cod.

Population Status: The Cape Cod/GOM yellowtail flounder stock continues to be overfished and overfishing is continuing. However, fishing mortality has been declining since 2004 and was at the lowest level observed in the time series in 2009. Spawning stock biomass has increased the past few years.

6.2.1.10 Georges Bank Yellowtail Flounder

Life History: The general life history of the GB yellowtail flounder, *Limanda ferruginea,* is comparable to the Cape Cod/GOM yellowtail described above. The median age at maturity for females is 1.8 years on Georges Bank. Spawning takes place along continental shelf waters of Georges Bank.

Population Status: The exact status determination for GB yellowtail flounder is unknown. Overfishing is unknown.

6.2.1.11 Southern New England/Mid-Atlantic Yellowtail Flounder

Life History: The general life history of the SNE/MA yellowtail flounder, *Limanda ferruginea,* is comparable to the Cape Cod/GOM yellowtail described above. The median age at maturity for females is 1.6 years off southern New England.

Population Status: Based on a 2012 assessment, the SNE/MA yellowtail flounder stock is not overfished, not subject to overfishing, and is rebuilt. The assessment concluded that the stock is less productive than previously believed and, as a result, the overall biomass at recently seen low levels represents the rebuilt state of nature for the stock.

6.2.1.12 Redfish

Life History: The Acadian redfish, *Sebastes fasciatus* Storer, and the deepwater redfish, *S. mentella* Travin, are virtually indistinguishable from each other based on external characteristics. Deepwater redfish are less prominent in the more southerly regions of the Scotian Shelf and appear to be virtually absent from the Gulf of Maine. Conversely, Acadian redfish appear to be the sole representative of the genus Sebastes. NMFS manages Acadian redfish inhabiting the U.S. waters of the Gulf of Maine and deeper portions of Georges Bank and the Great South Channel as a unit stock.

The redfish are a slow growing, long-lived, ovoviviparous species with an extremely low natural mortality rate. Redfish fertilize their eggs internally. The eggs develop into larvae within the oviduct, and are released near the end of the yolk sac phase. The release of larvae lasts for 3 to 4 months with a peak in late May to early June. Newly spawned larvae occur in the upper 10 m of the water column; at 0.4 to 1.0 in (10 to 25 mm). The post-larvae descend below the thermocline when about 1 in (25 mm) in length. Young-of-the-year are pelagic until reaching 1.6 to 2.0 in (40 to 50 mm) at 4 to 5 months old. Therefore, young-of-the-year typically move to the bottom by early fall of their first year. Redfish of 9 in (22 cm) or greater are considered adults. In general, the size of landed redfish positively correlates with depth. This may be due to a combination of differential growth rates of stocks, confused species identification (deepwater redfish are a larger species), size-specific migration, or gender-specific migration (females are larger). Redfish make diurnal vertical migrations linked to their primary euphausiid prey. Nothing is known about redfish breeding behavior. However, redfish fertilization is internal and fecundity is relatively low.

Population Status: The redfish stock is not overfished and overfishing is not occurring.

6.2.1.13 Pollock

Life History: Pollock, *Pollachius virens*, occur on both sides of the North Atlantic. In the western North Atlantic, the species is most abundant on the western Scotian Shelf and in the Gulf of Maine. There is considerable movement of pollock between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Although some differences in meristic and morphometric characters exist, there are no significant genetic differences among areas. As a result, pollock are assessed as a single unit. The principal pollock spawning sites in the western North Atlantic are in the western Gulf of Maine, Great South Channel, Georges Bank, and on the Scotian Shelf. Spawning takes place from September to April. Spawning time is more variable in northern sites than in southern sites. Spawning occurs over hard, stony, or rocky bottom. Spawning activity begins when the water column cools to near 46 °F (8°C) and peaks when temperatures are approximately 40 to 43 °F (4.5 to 6°C). Thus, most spawning occurs within a comparatively narrow range of temperatures.

Pollock eggs are buoyant and rise into the water column after fertilization. The pelagic larval stage lasts for 3 to 4 months. At this time the small juveniles or “harbor pollock” migrate inshore to inhabit rocky subtidal and intertidal zones. Pollock then undergo a series of inshore-offshore movements linked to temperature until near the end of their second year. At this point, the juveniles move offshore where the pollock remain throughout the adult stage. Pollock are a schooling species and occur throughout the water column. With the exception of short migrations due to temperature changes and north-south movements for spawning, adult pollock are fairly stationary in the Gulf of Maine and along the Nova Scotian coast. Male pollock reach sexual maturity at a larger size and older age than females. Age and size at maturity of pollock have declined in recent years. This similar trend has also been reported in other marine fish species such as haddock and witch flounder.

Population Status: The pollock stock is not overfished and overfishing is not occurring.

6.2.1.14 White Hake

Life History: The white hake, *Urophycis tenuis*, occurs from Newfoundland to southern New England and is common on muddy bottom throughout the Gulf of Maine. The depth distribution of white hake varies by age and season. Juvenile white hake typically occupy shallower areas than adults, but individuals of all ages tend to move inshore or shoalward in summer and disperse to deeper areas in winter. The northern spawning group of white hake spawns in late summer (August-September) in the southern Gulf of St. Lawrence and on the Scotian Shelf. The timing and extent of spawning in the Georges Bank - Middle Atlantic spawning group has not been clearly determined. The eggs, larvae, and early juveniles are pelagic. Older juvenile and adult white hake are demersal. The eggs are buoyant. Pelagic juveniles become demersal at 2.0 to 2.4 in (50 to 60 mm) total length. The pelagic juvenile stage lasts about two months. White hake attain a maximum length of 53 in (135 cm) and weigh up to 49 lbs (22 kg). Female white hake are larger than males.

Population Status: The 2013 assessment for white hake concluded the stock is not overfished and overfishing is not occurring (NEFSC 2013).

6.2.1.15 SNE/MA Winter Flounder

Life History: The winter flounder, blackback, or lemon sole, *Psuedopleuronectes americanus*, is a demersal flatfish distributed in the western North Atlantic from Labrador to Georgia. Winter flounder prefer mud, sand, clay, and even gravel habitat, but offshore populations may occur on hard bottom (Collette and Klein-MacPhee 2002). They migrate inshore in the fall and early winter and spawn in late winter and early spring (Pereira et al. 1999), with peak spawning occurring in Massachusetts Bay and south of Cape Cod during February and March, continuing into May. After spawning, adults typically leave inshore areas when water temperatures exceed 59 °F (15ºC) although some remain inshore year-round. The eggs of winter flounder are demersal, adhesive, and stick together in clusters. Larvae are initially planktonic but become increasingly bottom-oriented as metamorphosis approaches. Metamorphosis is when the left eye migrates to the right side of the body and the larvae become "flounder-like". It begins around 5 to 6 weeks after hatching, and finishes by the time the larvae are 0.3 to 0.4 in (8 to 9 mm) in length at about 8 weeks after hatching. Newly metamorphosed young-of-the-year winter flounder reside in shallow water where individuals may grow to about 4 in (100 mm) within the first year (Collette and Klein-MacPhee 2002). In U.S. waters, the resource is assessed and managed as three stocks: Gulf of Maine, Southern New England/Mid-Atlantic (SNE/MA), and Georges Bank.

Population Status: A benchmark assessment completed for SNE/MA winter flounder in 2011 concluded that this stock was overfished but overfishing was not occurring in 2010 (NEFSC 2011b).

6.2.1.16 GOM/GB Windowpane Flounder

Life History: Windowpane flounder or sand flounder, *Scophthalmus aquosus*, is a left-eyed, flatfish species that occurs in the northwest Atlantic from the Gulf of St. Lawrence to Florida (Collette and Klein-MacPhee 2002). Windowpane prefer sandy bottom habitats. They occur at depths from the high water mark to 656 ft. (200 m), with the greatest abundance at depths < 180 ft. (55 m), and at temperatures between 32º-80ºF (0º-26.8ºC) (Moore 1947). On Georges Bank, the species is most abundant at depths <60 m during late spring through autumn but overwintering occurs in deeper waters out to 366 m (Chang et al. 1999). Windowpane flounders are assessed and managed as two stocks: Gulf of Maine-Georges Bank (GOM/GB) and Southern New England-Mid-Atlantic Bight (SNE/MA) due to differences in growth rates, size at maturity, and relative abundance trends. Windowpane generally reach sexual maturity between ages 3 and 4 (Moore 1947), though males can mature at age 2 (Grosslein and Azarovitz 1982). On Georges

Bank, median length at maturity is nearly the same for males (8.7 in, 22.2 cm) and females (8.9 in, 22.5 cm) (O'Brien et al. 1993). Spawning occurs on Georges bank during July and August and peaks again between October and November at temperatures of 55º- 61ºF (13º-16ºC) (Morse and Able 1995). Eggs incubate for 8 days at 50º-55ºF (10º-13ºC) and eye migration occurs approximately 17- 26 days after hatching (G. Klein-MacPhee, unpubl. data, as cited in Collette and Klein-MacPhee 2002). During the first year of life, spring-spawned fish have significantly faster growth rates than autumn- spawned fish, which may result in differential natural mortality rates between the two cohorts (Neuman et al. 2001). Young windowpane settle inshore and then move offshore to deeper waters as they grow. Trawl survey data suggest that windowpane on Georges Bank aggregate in shallow water during summer and early fall and move offshore in the winter and early spring (Grosslein and Azarovitz 1982).

Population Status: Indices from NEFSC fall surveys are used as an indicator of stock abundance and biomass. These biomass indices have fluctuated above and below the time series median as fishing mortality rates have fluctuated below and above the point where the stock could replenish itself. Biomass indices increased to levels at or slightly above the median during 1998-2003, but then fell below the median from 2004-2010 and was 29% of B_{MSY} in 2010 (NEFSC 2012). According to a 2012 assessment update, the stock was overfished and overfishing was occurring in 2010.

6.2.1.17 SNE/MAB Windowpane Flounder

Life History: Windowpane flounder, *Scophthalmus aquosus*, is a left-eyed, flatfish species that occurs in the northwest Atlantic from the Gulf of St. Lawrence to Florida, with the greatest abundance on Georges Bank and in the New York Bight (Collette and Klein-MacPhee 2002). Windowpane prefer sandy bottom habitats at depths < 180 ft. (55 m), but they occur at depths from the high water mark to 656 ft. (200 m) and at temperatures between 32º-80ºF (0º-26.8ºC) (Moore 1947). Windowpane flounders are assessed and managed as two stocks: Gulf of Maine-Georges Bank (GOM/GB) and Southern New England-Mid-Atlantic Bight (SNE/MA) due to differences in growth rates, size at maturity, and relative abundance trends. Windowpane generally reach sexual maturity between ages 3 and 4 (Moore 1947), though males can mature at age 2 (Grosslein and Azarovitz 1982). In Southern New England, median length at maturity is nearly the same for males (8.5 in, 21.5 cm) and females (8.3 in, 21.2 cm) (O'Brien et al. 1993). A split spawning season occurs between Virginia and Long Island with peaks in spring and fall (Chang et al. 1999). Spawning occurs in the southern Mid-Atlantic during April and May and then peaks again in October or November (Morse and Able 1995). Eggs incubate for 8 days at 50º-55ºF (10º-13ºC) and eye migration occurs approximately 17- 26 days after hatching (G. Klein-MacPhee, unpubl. data, as cited in Collette and Klein-MacPhee 2002). During the first year, spring-spawned fish have significantly faster growth rates than autumn-spawned fish, which may lead to different natural mortality rates (Neuman et al. 2001).

Population Status: A 2012 assessment update indicated that in 2010 biomass was well above the B_{MSY} proxy (146%) and overfishing was not occurring (NEFSC 2012). As a result this stock has been declared rebuilt.

6.2.1.18 Ocean Pout

Life History: Ocean pout, *Zoarces americanus*, is a demersal eel-like species found in the northwest Atlantic from Labrador to Delaware. Ocean pout are most common sand and gravel bottom (Orach-Meza 1975) at an average depth of 49-262 ft. (15-80 m) (Clark and Livingstone 1982) and temperatures of 43º- 48º F (6º-9º C) (Scott 1982). In U.S. waters, ocean pout are assessed and managed as a unit stock from the Gulf of Maine to Delaware. In the Gulf of Maine, median length at maturity for males and females was 11.9 in (30.3 cm) and 10.3in (26.2 cm), respectively. Median length at maturity for males and females from Southern New England was 12.6 in (31.9 cm) and 12.3in (31.3 cm), respectively (O'Brien et al. 1993).

According to tagging studies conducted in Southern New England, ocean pout appear not to migrate, but do move between different substrates seasonally. In Southern New England-Georges Bank they occupy cooler rocky areas in summer, returning in late fall (Orach-Meza 1975). In the Gulf of Maine, they move out of inshore areas in the late summer and then return in the spring. Spawning occurs between September and October in Southern New England (Olsen and Merriman 1946) and in August and September in Newfoundland (Keats et al. 1985). Adults aggregate in rocky areas prior to spawning. Eggs are internally fertilized (Mercer et al. 1993; Yao and Crim 1995a) and females lay egg masses in encased in a gelatinous matrix that they then guard during the incubation period of 2.5-3 months (Keats et al. 1985). Ocean pout hatch as juveniles on the bottom and are believed to remain there throughout their lives (Methven and Brown 1991; Yao and Crim 1995a).

Population Status: Between 1975 and 1985, NEFSC spring trawl survey biomass indices increased to record high levels, peaking in 1981and 1985. Since 1985, survey catch per tow indices have generally declined, and the 2010 index was the lowest value in the time series. Catch and exploitation rates have also been low, but stock size has not increased. A 2012 assessment update determined that in 2010 ocean pout was overfished, but overfishing was not occurring (NEFSC 2012).

6.2.1.19 Atlantic Halibut

Life History: Atlantic halibut, *Hippoglossus hippoglossus*, is the largest species of flatfish found in the northwest Atlantic Ocean. This long-lived, late-maturing flatfish is distributed from Labrador to southern New England (Collette and Klein-MacPhee 2002). They prefer sand, gravel, or clay substrates at depths up to 1000 m (Scott and Scott 1988; Miller et al. 1991). Along the coastal Gulf of Maine, halibut move to deeper water in winter and shallower water in summer (Collette and Klein-MacPhee 2002). Atlantic halibut reach sexual maturity between 5 to 15 years and the median female age of maturity in the Gulf of Maine-Georges Bank region is 7 years (Sigourney et al. 2006). In general, Atlantic halibut spawn once per year in synchronous groups during late winter through early spring (Neilson et al. 1993) and females can produce up to 7 million eggs per year depending on size (Haug and Gulliksen 1988). Spawning is believed to occur in waters of the upper continental slope at depths of 200 m or greater (Scott and Scott 1988). Halibut eggs are buoyant but drift suspended in the water at depths of 54-90 m (Tåning 1936). Incubation times are 13-20 days depending on temperature (Blaxter et al. 1983), how long halibut live in the plankton after hatching is not known.

Population Status: Survey indices are highly variable because the NEFSC trawl surveys catch low numbers of halibut. The spring survey abundance index suggested a relative increase during the late 1970s to the early 1980s, a decline during the 1990s, and an increase since the late 1990s. Based on the results of a 2012 assessment update, Atlantic halibut is overfished and overfishing is not occurring (NEFSC 2012).

6.2.1.20 Atlantic Wolffish

Life History: Atlantic wolffish, *Anarhichas lupus*, is a benthic fish distributed on both sides of the North Atlantic Ocean. In the northwest Atlantic the species occurs from Davis Straits off of Greenland to Cape Cod and sometimes in southern New England and New Jersey waters (Collette and Klein-MacPhee 2002). In the Georges Bank-Gulf of Maine region, abundance is highest in the southwestern portion at depths of 263-394 ft. (80 - 120 m), but wolffish are also found in waters from 131-787 ft. (40 to 240 m) (Nelson and Ross 1992) and at temperatures of 29.7º-50.4º F (-1.3º-10.2º C) (Collette and Klein-MacPhee 2002). They prefer complex benthic habitats with large stones and rocks (Pavlov and Novikov 1993). Atlantic wolffish are mostly sedentary and solitary, except during mating season. There is some evidence of a weak seasonal shift in depth between shallow water in spring and deeper water in fall (Nelson and Ross 1992). Most individuals mature by age 5-6 when they reach approximately 18.5 in (47 cm) total length (Nelson and Ross 1992, Templeman 1986). However, size at first maturity varies regionally; northern fish mature at smaller sizes than faster growing southern fish. There is conflicting information about the spawning season for Atlantic wolffish in the Gulf of Maine-Georges Bank region. Peak spawning period is believed to occur from September to October (Collette and Klein-MacPhee 2002), though laboratory studies have shown that wolffish can spawn most of the year (Pavlov and Moksness 1994). Eggs are laid in masses and that the males are thought to brood for several months. Incubation time is dependent on water temperature and may be 3 to 9 months. Larvae and early juveniles are pelagic between 20 and 40 mm TL, with settlement beginning by 50 mm TL (Falk-Petersen and Hansen 1990).

Population Status: NEFSC spring and fall bottom trawl survey indices show abundance and biomass of Atlantic wolffish generally has declined over the last two to three decades. However, Atlantic wolffish are encountered infrequently on NEFSC bottom trawl surveys and there is uncertainty as to whether the NEFSC surveys adequately sample this species (NDPSWG, 2009). Atlantic wolffish continues to be considered a data poor species. An assessment update in 2012 determined that the stock is overfished, but overfishing is not occurring.

6.2.2 Assemblages of Fish Species

Georges Bank and the Gulf of Maine have historically had high levels of fish production. Several studies have identified demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. The study identified depth and salinity as major physical influences explaining assemblage structure. Table 17 (adapted from Amendment 16) compares the six assemblages identified in Gabriel (1992) with the five assemblages from Overholtz and Tyler (1985). This EA considers these assemblages and relationships to be relatively consistent. Therefore, these descriptions generally describe the affected area. The assemblages include allocated target species, as well as non-allocated target species and bycatch. The terminology and definitions of habitat types in Table 17 vary slightly between the two studies. For further information on fish habitat relationships, see Table 15.

Table 17 - Comparison of Demersal Fish Assemblages of Georges Bank and the Gulf of Maine

Overholtz and Tyler (1985)		Gabriel (1992)	
Assemblage	Species	Species	Assemblage
Slope and Canyon	offshore hake, blackbelly rosefish, Gulf stream flounder, fourspot flounder, goosefish, silver hake, white hake, red hake	offshore hake, blackbelly rosefish, Gulf stream flounder, fawn cusk-eel, longfin hake, armored sea robin	Deepwater
Intermediate	silver hake, red hake, goosefish, Atlantic cod, haddock, ocean pout, yellowtail flounder, winter skate, little skate, sea raven, longhorn sculpin	silver hake, red hake, goosefish, northern shortfin squid, spiny dogfish, cusk	Combination of Deepwater Gulf of Maine/Georges Bank and Gulf of Maine-Georges Bank Transition
Shallow	Atlantic cod, haddock, pollock, silver hake, white hake, red hake, goosefish, ocean pout	Atlantic cod, haddock, pollock	Gulf of Maine-Georges Bank Transition Zone
	yellowtail flounder, windowpane winter flounder, winter skate, little skate, longhorn sculpin, summer flounder, sea raven, sand lance	yellowtail flounder, windowpane winter flounder, winter skate, little skate, longhorn sculpin	Shallow Water Georges Bank-southern New England
Gulf of Maine-Deep	white hake, American plaice, witch flounder, thorny skate, silver hake, Atlantic cod, haddock, cusk, Atlantic wolffish	white hake, American plaice, witch flounder, thorny skate, redfish	Deepwater Gulf of Maine-Georges Bank
Northeast Peak	Atlantic cod, haddock, pollock, ocean pout, winter flounder, white hake, thorny skate, longhorn sculpin	Atlantic cod, haddock, pollock	Gulf of Maine-Georges Bank Transition Zone

6.2.3 Stock Status Trends

The most recent stock assessments for the 20 groundfish stocks can be found via the NEFSC website at http://www.nefsc.noaa.gov/saw/. The information in this section is adapted from the most recent stock assessment report for the groundfish stocks. The information in this section is adapted from the most recent stock assessment report for the groundfish stocks. Table 18 summarizes the status of the northeast groundfish stocks.

Table 18 - Status of the Northeast Groundfish Stocks for fishing year 2014

Stock Status	Stock (assessment source)
<u>Overfished and Overfishing</u> Biomass < ½ B_{MSY} and F > F_{MSY}	GB Cod (GARM III) GOM Cod (SARC 54) Cape Cod/GOM Yellowtail Flounder (assessment update) White Hake (GARM III,) Witch Flounder (assessment update) Northern Windowpane (operational assessment) GB Yellowtail Flounder (2012 TRAC)
<u>Overfished but not Overfishing</u> Biomass < ½ B_{MSY} and F <u><</u> F_{MSY}	Ocean Pout (assessment update) Atlantic Halibut (assessment update) GOM Winter Flounder (SARC 52)[b] Atlantic wolffish (assessment update) SNE/MA Winter Flounder
<u>Not Overfished but Overfishing</u> Biomass <u>></u> ½ B_{MSY} and F >	
<u>Not Overfished and not Overfishing</u> Biomass <u>></u> ½ B_{MSY} and F <u><</u> F_{MSY}	Pollock (SARC 50) Acadian Redfish (assessment update) SNE/MA yellowtail flounder (SARC 54) American Plaice (assessment update) GOM Haddock (SARC 59) GB Haddock (assessment update) GB Winter Flounder(SARC 52) Southern Windowpane (assessment update)

Notes:

B_{MSY} = biomass necessary to produce maximum sustainable yield

(MSY) F_{MSY} = fishing mortality rate that produces the MSY

[b] Rebuilding, but no defined rebuilding program due to a lack of data. Unknown whether the stock is overfished.

Assessment references (available at http://www.nefsc.noaa.gov/saw/)

Northeast Fisheries Science Center. 2008. Assessment of 19 Northeast Groundfish Stocks through 2007: Report of the 3rd Groundfish Assessment Review Meeting (GARM III), Northeast Fisheries Science Center, Woods Hole, Massachusetts, August 4-8, 2008. US Dep Commer, NOAA Fisheries, Northeast Fish Sci Cent Ref Doc. 08-15; 884 p + xvii.

Northeast Fisheries Science Center. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 10-17; 844 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026

Northeast Fisheries Science Center. 2011. 52nd Northeast Regional Stock Assessment Workshop (52nd SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 11-17; 962 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026

Northeast Fisheries Science Center. 2012. 53rd Northeast Regional Stock Assessment Workshop (53rd SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-03; 33 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026

Northeast Fisheries Science Center. 2012. 54th Northeast Regional Stock Assessment Workshop (54th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-14; 40 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026,

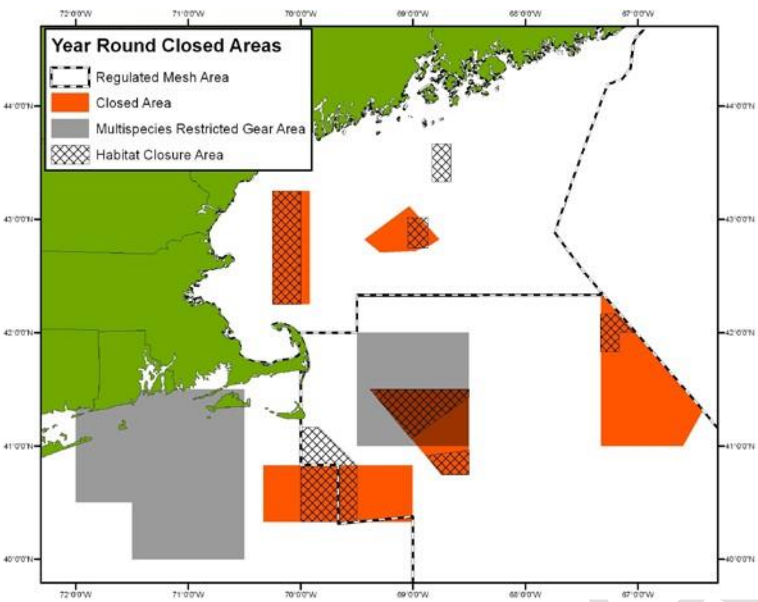
Northeast Fisheries Science Center. 2012. Assessment or Data Updates of 13 Northeast Groundfish Stocks through 2010. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-06; 789 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026

6.2.4 Areas Closed to Fishing

Select areas are closed to some level of fishing to protect the sustainability of fishery resources. Long- term closures result in the removal or reduction of fishing effort from important fishing grounds. Therefore, fishery related mortalities to stocks utilizing the closed areas should decrease. Figure 8 shows the Closed Areas for FY 2013.

Amendment 13 to the Northeast Multispecies FMP and Amendment 10 of the Atlantic Sea Scallop FMP established year-round habitat closed areas which are off-limits to all mobile, bottom-tending gear like trawls and dredges. These closures were designed to minimize the adverse effects of fishing on EFH for species managed by the NEFMC (Table 15). In many cases, these closed areas overlap portions of the groundfish mortality closures (see Figure 8). However, in other cases (Jeffreys Bank in the Gulf of Maine and the area southeast of Nantucket Island) they do not. NEFMC Omnibus EFH Amendment 2 is currently evaluating the closed habitat areas. Therefore, these areas may be changed or eliminated in the future. FW 48 allowed sectors to request exemptions to the closed areas. In addition, portions of four submarine canyons on the outer continental shelf are closed to all bottom trawling in order to protect vulnerable habitats for tilefish. Detailed descriptions and maps of these areas are available in Amendment 1 to the MAFMC Tilefish FMP.

Figure 8 - Northeast Multispecies Closed Areas and U.S./Canada



6.2.5 Interaction between Gear and Allocated Target Species

FY 2010 through FY 2011 data show that the majority of fish of all species caught on groundfish trips are caught with trawls. GARM III indicated that only cod and white hake are caught in significant numbers by gillnets. Only haddock are caught in significant numbers by hook and line.

6.3 Non-Allocated Target Species and Bycatch

Non-allocated target species are species which sector vessels are not assigned an ACE but can target and land. Bycatch refers to fish which are harvested in a fishery, but are discarded and not sold or kept for personal use. Non-allocated target species and bycatch may include a broad range of species. For purposes of this assessment the non-allocated target species and bycatch most likely to be affected by the sector operations plans include spiny dogfish, skates, and monkfish. This approach follows the convention established in Amendment 16. Spiny dogfish, skates, and monkfish were the top three non- groundfish species landed by multispecies vessels in FY 2006 and FY 2007 under the Category B (regular) DAS program (Amendment 16, Table 87). American lobster is also included as a non-target bycatch species for FY 2012 because many sector vessels also fish in the lobster fishery. These species have no allocation under the Northeast Multispecies FMP and are managed under separate FMPs. Fishermen commonly land monkfish and skates. Spiny dogfish tend to be relatively abundant in catches. Fishermen may land some spiny dogfish, but dogfish are often the predominant component of the discarded bycatch. Fishermen may discard monkfish when regulations or market conditions constrain the amount of the catch that they can land.

Scallops, fluke, whiting and squid are included in this section because fishing activity for these species will be affected by measures in this action that are designed to reduce or control catches of groundfish species by these fisheries.

6.3.1 Spiny Dogfish

Life History: The spiny dogfish, *Squalus acanthias*, occurs in the western North Atlantic from Labrador to Florida. Regulators consider spiny dogfish to be a unit stock off the coast of New England. In summer, dogfish migrate northward to the Gulf of Maine-Georges Bank region and into Canadian waters. They return southward in autumn and winter. Spiny dogfish tend to school by size and, when mature, by sex. The species bears live young, with a gestation period of about 18 to 22 months, and produce between 2 to 15 pups with an average of 6. Size at maturity for females is around 31 in (80 cm), but can vary from 31 to 33 in (78 cm to 85 cm) depending on the abundance of females.

Population Management and Status: The NEFMC and MAFMC jointly develop the spiny dogfish FMP for federal waters. The Atlantic States Marine Fisheries Commission (ASMFC) concurrently develops a plan for state waters. Spawning stock biomass of spiny dogfish declined rapidly in response to a directed fishery during the 1990's. NFMS initially implemented management measures for spiny dogfish in 2001. These measures have been effective in reducing landings and fishing mortality. Based upon the 2009 updated stock assessment performed by the Northeast Fisheries Science Center, the spiny dogfish stock is not presently overfished and overfishing is not occurring. NMFS declared the spiny dogfish stock rebuilt for the purposes of U.S. management in May 2010.

6.3.2 Skates

Life History: The seven species in the Northeast Region skate complex are: little skate (*Leucoraja erinacea*), winter skate (*L. ocellata*), barndoor skate (*Dipturus laevis)*, thorny skate (*Amblyraja radiata*), smooth skate (*Malacoraja senta*), clearnose skate (*Raja eglanteria*), and rosette skate (*L. garmani*). The barndoor skate is the most common skate in the Gulf of Maine, on Georges Bank, and in southern New England. Georges Bank and southern New England is the center of distribution for the little and winter skates in the Northeast Region. . The thorny and smooth skates typically occur in the Gulf of Maine. The clearnose and rosette skates have a more southern distribution, and occur primarily in southern New England and the Chesapeake Bight.

Skates are not known to undertake large-scale migrations. Skates tend to move seasonally in response to changes in water temperature. Therefore, they move offshore in summer and early autumn and then return inshore during winter and spring. Skates lay eggs enclosed in a hard, leathery case commonly called a mermaid's purse. Incubation time is 6 to 12 months, with the young having the adult form at the time of hatching.

Population Management and Status: NMFS implemented the Northeast Skate Complex Fishery Management Plan (Skate FMP) in September 2003. The FMP required by both dealers and vessels to report skate landings by species (http://www.nefmc.org/skates/fmp/fmp.htm). Possession prohibitions of barndoor, thorny, and smooth skates in the Gulf of Maine were also provisions of the FMP. The FMP implemented a trip limit of 10,000 lbs (4,536 kg) for winter skate, and required fishermen to obtain a Letter of Authorization to exceed trip limits for the little skate bait fishery.

In 2010 Amendment 3 to the Skate FMP implemented a rebuilding plan for smooth skate and established an ACL and annual catch target for the skate complex, total allowable landings for the skate wing and bait fisheries, and seasonal quotas for the bait fishery. Amendment 3 also reduced possession limits, in-season possession limit triggers, and other measures to improve management of the skate fisheries. Due to insufficient information about the population dynamics of skates, there remains considerable uncertainty about the status of skate stocks. Based on NEFSC bottom trawl survey data through autumn 2011/spring 2012 one skate species was overfished (thorny) and overfishing was not occurring in any of the seven skate species.

Skate landings have generally increased since 2000. The landings and catch limits proposed by Amendment 3 have an acceptable probability of promoting biomass growth and achieving the rebuilding (biomass) targets for thorny skates. Modest reductions in landings and a stabilization of total catch below the median relative exploitation ratio should cause skate biomass and future yield to increase.

6.3.3 Monkfish

Life History: Monkfish, *Lophius americanus*, also called goosefish, occur in the western North Atlantic from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Monkfish occur from inshore areas to depths of at least 2,953 ft. (900 m). Monkfish undergo seasonal onshore-offshore migrations. These migrations may relate to spawning or possibly to food availability.

Female monkfish begin to mature at age 4 with 50 percent of females maturing by age 5 (about 17 in [43 cm]). Males generally mature at slightly younger ages and smaller sizes (50 percent maturity at age 4.2 or 14 in [36 cm]). Spawning takes place from spring through early autumn. It progresses from south to north, with most spawning occurring during the spring and early summer. Females lay a buoyant egg raft or veil that can be as large as 39 ft. (12 m) long and 5 ft. (1.5 m) wide, and only a few mm thick. The larvae hatch after about 1 to 3 weeks, depending on water temperature. The larvae and juveniles spend several months in a pelagic phase before settling to a benthic existence at a size of about 3 in (8 cm).

Population Management and Status: NMFS implemented the Monkfish FMP in 1999 (NEFMC and MAFMC 1998). The FMP included measures to stop overfishing and rebuild the stocks through a number of measures. These measures included:

- Limiting the number of vessels with access to the fishery and allocating DAS to those vessels;
- Setting trip limits for vessels fishing for monkfish; minimum fish size limits;
- Gear restrictions;

- Mandatory time out of the fishery during the spawning season; and
- A framework adjustment process.

The Monkfish FMP defines two management areas for monkfish (northern and southern), divided roughly by an east-west line bisecting Georges Bank. Monkfish in both management regions are not overfished and overfishing is not occurring.

6.3.4 Summer Flounder

Life History: Summer flounder, *Paralichthys dentatus*, occur in the western North Atlantic from the southern Gulf of Maine to South Carolina. Summer flounder are concentrated in bays and estuaries from late spring though early autumn, when an offshore migration to the outer continental shelf is undertaken.

Spawning occurs during autumn and early winter, and the larvae are transported toward coastal areas by prevailing water currents. Development of post larvae and juveniles occurs primarily within bays and estuarine areas. Most fish are sexually mature by age 2. Female summer flounder may live up to 20 years, but males rarely live for more than 10 years. Growth rates differ appreciably between the sexes with females attaining weights up to 11.8 kg (26 lbs.).

Population Management and Status: The FMP was developed by the Mid-Atlantic Fishery Management Council in 1988. Scup and black sea bass were later incorporated into the FMP. Amendment 2, implemented in 1993, established a commercial quota allocated to the states, a recreational harvest limit, minimum size limits, gear restrictions, permit and reporting requirements, and an annual review process to establish specifications for the coming fishing year. In 1999, Amendment 12 revised the overfishing definitions for all three species, established rebuilding programs, addressed bycatch and habitat issues and established a framework adjustment procedure for the FMP to allow for a streamlined process for relatively minor changes to management measures.

The stock is not overfished and overfishing is not occurring (NEFSC 2008).

6.3.5 American Lobster

Life History: The American lobster, *Homarus americanus*, occurs in continental shelf waters from Maine to North Carolina. The American lobster is long-lived and known to reach more than 40 pounds in body weight (Wolff, 1978). Lobsters are encased in a hard external skeleton that is periodically cast off (molted) to allow growth and mating to take place. Eggs are carried under the female's abdomen during the 9 to 12 month incubation period. Larger lobsters produce eggs with greater energy content and thus, may produce larvae with higher survival rates (Attard and Hudon, 1987). Seasonal timing of egg extrusion and larval hatching is somewhat variable among areas and may also vary due to seasonal weather patterns. Overall, hatching tends to occur over a four month period from May – September, occurring earlier and over a longer period in the southern part of the range. The pelagic larvae molt four times before they resemble adults and settle to the bottom. They will molt more than 20 times over a period of 5 to 8 years before they reach the minimum legal size to be harvested. Cooper and Uzmann, (1971) and Uzmann, et al., (1977) observed that tagged lobster were observed to move to relatively cool deep canyon areas in late fall and winter, and then migrate back to shallower and relatively warm water in spring and summer.

Population Management and Status: The states and NMFS cooperatively manage the American lobster resource and fishery under the framework of the Atlantic States Marine Fisheries Commission (ASMFC). States have jurisdiction for implementing measures in state waters, while NMFS implements complementary regulations in federal waters. Inshore landings have increased steadily since the early 1970s. Fishing effort is intense and increasing throughout much of the range of the species. The majority of the landings are reportedly harvested from state waters (within 3 miles of shore). The most recent peer-reviewed stock assessment for American lobster, published by the ASMFC in 2009, identifies the status of the three biological stock units, delineated primarily on the basis of regional differences in life history parameters, such as lobster distribution and abundance, patterns of migration, location of spawners, and the dispersal and transport of larvae. These stock units are the Gulf of Maine, Georges Bank, and Southern New England. While each area has an inshore and offshore component, Gulf of Maine and Southern New England areas support predominantly inshore fisheries and the Georges Bank supports a predominantly offshore fishery. The most recent 2009 Stock Assessment Report concluded that "(t)he American lobster fishery resource presents a mixed picture, with stable abundance for much of the Gulf of Maine stock, increasing abundance for the Georges Bank stock, and decreased abundance and recruitment yet continued high fishing mortality for the Southern New England stock (ASMFC 2009).

6.3.6 Whiting (Silver Hake)

This description is quoted from the NEFSC Status of Fishery Resources (http://www.nefsc.noaa.gov/sos/spsyn/pg/silverhake/).

Life History: Silver hake, also known as whiting, *Merluccius bilinearis*, range primarily from Newfoundland to South Carolina. Silver hake are fast swimmers with sharp teeth, and are important fish predators that also feed heavily on crustaceans and squid (Lock and Packer 2004). In U.S. waters, two stocks have been identified based on differences of head and fin lengths (Almeida 1987), otolith morphometrics (Bolles and Begg 2000), otolith growth differences, and seasonal distribution patterns (Lock and Packer 2004). The northern silver hake stock inhabits Gulf of Maine - Northern Georges Bank waters, and the southern silver hake stock inhabits Southern Georges Bank - Middle Atlantic Bight waters. Silver hake migrate in response to seasonal changes in water temperatures, moving toward shallow, warmer waters in the spring. They spawn in these 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, whereas during the 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).

Population Management and Status: Due to their abundance and availability, silver hake have supported important U.S. and Canadian fisheries as well as distant-water fleets. Landings increased to 137,000 mt in 1973 and then declined sharply with increased restrictions on distant-water fleet effort and implementation of the Magnuson Fishery Conservation and Management Act (MFCMA) in 1977. U.S. landings during 1987-1996 were relatively stable, averaging 16,000 mt per year, but have gradually declined to a historic low of 6,800 mt in 2005.

The otter trawl remains the principal gear used in the U.S. fishery, and recreational catches have been low since 1985. Silver hake are managed under the New England Fishery Management Council's Northeast Multispecies Fishery Management Plan ("non-regulated multispecies" category). In 2000, the New England Fishery Management Council implemented Amendment 12 to this FMP, and placed silver hake into the "small mesh multispecies" management unit, along with red hake and offshore hake. This amendment established retention limits based on net mesh size, adopted overfishing definitions for northern and southern stocks, identified essential fish habitat for all life stages, and set requirements for fishing gear (NEFMC 2000). Amendment 19 established Annual Catch Limits, Accountability Measures, and updated stock status definitions. Both stocks of silver hake are not overfished and are not experiencing overfishing (NEFSC 2011a).

6.3.7 Longfin Squid

This description is quoted from the NEFSC Status of Fishery Resources (http://www.nefsc.noaa.gov/sos/spsyn/iv/lfsquid/).

Life History: Longfin inshore squid (*Loligo pealeii*) are distributed primarily in continental shelf waters located between Newfoundland and the Gulf of Venezuela (Cohen 1976; Roper et al. 1984). In the northwest Atlantic Ocean, longfin squid are most abundant in the waters between Georges Bank and Cape Hatteras where the species is commercially exploited. The stock area extends from the Gulf of Maine to Cape Hatteras. Distribution varies seasonally. North of Cape Hatteras, squid migrate offshore during late autumn to overwinter in warmer waters along the shelf edge and slope, and then return inshore during the spring where they remain until late autumn (Jacobson 2005). The species lives for about nine months, grows rapidly, and spawns year-round (Brodziak and Macy 1996) with peaks during late spring and autumn. Individuals hatched in summer grow more rapidly than those hatched in winter and males grow faster and attain larger sizes than females (Brodziak and Macy 1996).

Population Management and Status: The domestic fishery occurs primarily in Southern New England and Mid-Atlantic waters, but some fishing also occurs along the edge of Georges Bank. Fishing patterns reflect seasonal longfin distribution patterns and effort is generally directed offshore during October through April and inshore during May through September. The fishery is dominated by small-mesh otter trawlers, but near-shore pound net and fish trap fisheries occur during spring and summer. Since 1984, annual offshore landings have generally been three-fold greater than inshore landings. The stock is managed by the Mid-Atlantic Fishery Management Council under the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (FMP). Management measures for the *L. pealeii* stock include annual total allowable catches (TACs) which have been partitioned into seasonal quotas since 2000 (trimesters in 2000 and quarterly thereafter), a moratorium on fishery permits, and a minimum codend mesh size of 1 7/8 inches.

6.3.8 Atlantic Sea Scallops

Life History: This description is quoted from the NEFSC Status of Fishery Resources (http://www.nefsc.noaa.gov/sos/spsyn/iv/lfsquid/). Sea scallops *Placopecten magellanicus* are distributed in the northwest Atlantic Ocean from Newfoundland to North Carolina, mainly on sand and gravel sediments where bottom temperatures remain below 20°C (68°F). North of Cape Cod, concentrations generally occur in shallow water less than 40 m (22 fathoms) deep. South of Cape Cod and on Georges Bank, sea scallops typically occur at depths between 25 and 200 m (14 to 110 fathoms), with commercial concentrations generally between 35 and 100 m (19 to 55 fathoms). Sea scallops are filter feeders, feeding primarily on phytoplankton, but also on microzooplankton and detritus (Hart and Chute 2004). Sea scallops grow rapidly during the first several years of life. Between ages 3 and 5, they commonly increase 50 to 80% in shell height and quadruple their meat weight. Sea scallops have been known to live more than 20 years. They usually become sexually mature at age 2, but individuals younger than age 4 probably contribute little to total egg production. Sexes are separate and fertilization is external. Spawning usually occurs in late summer and early autumn; spring spawning may also occur, especially in the Mid-Atlantic Bight. Sea scallops are highly fecund; a single large female can release hundreds of millions of eggs annually. Larvae remain in the water column for four to seven weeks before settling to the bottom. Sea scallops attain commercial size at about four to five years old, though historically, three year olds were often exploited.

Population and Management Status: The commercial fishery for sea scallops is conducted year round, primarily using offshore New Bedford style scallop dredges. A small percentage of the fishery employs otter trawls, mostly in the Mid-Atlantic. The principal U.S. commercial fisheries are in the Mid-Atlantic (from Virginia to Long Island, New York) and on Georges Bank and neighboring areas, such as the Great South Channel and Nantucket Shoals. There is also a small, primarily inshore fishery for sea scallops in the Gulf of Maine. Recreational fishing is insignificant. Sea scallops have a somewhat uncommon combination of life-history attributes: low mobility, rapid growth, and low natural mortality. The Council established the Scallop FMP in 1982. A number of Amendments and Framework Adjustments have been implemented since that time to adjust the original plan. The scallop resource was last assessed in 2010 (SARC 50) and it was not overfished, and overfishing was not occurring. The Scallop PDT has evaluated biomass and fishing mortality since and based on 2012 estimates, biomass is 119,000 mt, well above the threshold for an overfished stock (1/2 Bmsy = 62,000 mt), and almost at Bmsy (125,000 mt). The estimate of fishing mortality overall is 0.34, above the target F of 0.32 but below the overfishing limit threshold of 0.38. Total catch has been stable at about 20-30,000 mt since 2001, up from about 5,000 mt harvests of the late 1990s.

6.3.9 Interaction between Gear and Non-allocated Target Species and Bycatch

The majority of the proposed sectors have minimal operational history; therefore, the analysis of interactions between gear and non-allocated target species and bycatch is based in part on catch information for the Northeast Multispecies FMP common pool fishery from FY 1996 to FY 2006. It is also based on sector data from FY 2009 to FY 2011, as presented in Section 6.5.10.

The Final Supplemental Environmental Impact Statement to Amendment 2 to the Monkfish FMP (NEFMC and MAFMC 2003) evaluated the potential adverse effects of gears used in the directed monkfish fishery. It evaluated impacts for monkfish and other federally-managed species, as well as the effects of fishing activities regulated under other federal FMPs on monkfish. Bottom trawls and bottom gillnets and the two gears used in the monkfish fishery. Amendment 2 to the Monkfish FMP (NEFMC and MAFMC 2003) describes these gears in detail. Sectors would use these same gears in FY 2012.

Fishermen in the Northeast Region harvest skates in two very different ways. Fishermen harvest whole skates for lobster bait. They also harvest skate wings for food. Vessels tend to catch skates when targeting other species like groundfish, monkfish, and scallops. The vessels will land skate if the price is high enough. The recent NEFMC Amendment to the Skate FMP and accompanying Final Supplemental Environmental Impact Statement (NEFMC 2009b) contain detailed information about skate fisheries.

Dogfish have the potential to interact with all gear types used by the sectors. Table 19 shows that otter trawl gear caught the majority of non-allocated target species and bycatch between FY 1996 to FY 2006.

Table 19 – Landings (mt) for non-allocated target species and bycatch by gear type[a]

	Trawl		**Gillnet**		**Dredge**		**Other Gear**		**Total[b]**	
Species	Landings	Discard	Landings	Discard	Landings	Discard	Landings	Discard	Landings	Discard
Monkfish	NA	16,516	NA	6,526	NA	16,136	NA	4 [c]	228,000	39,182
Skates	117,381	315,308	29,711	26,601	--	146,725	4,413	2,646 [d]	151,505	491,280
Dogfish	24,368	61,914	72,712	39,852	--	--			98,026	101,766

Notes:
NA = landings or discard data not available for individual fishery gear type for this species.
-- = None reported
[a] Monkfish 1996-2006, skates 1996-2006, dogfish 1996-2006
[b] Total landings or discards may differ slightly from the sum of the individual fishery entries due to differences in rounding.
[c] Shrimp Trawl
[d] Line and Shrimp Trawl
Source: Northeast Data Poor Stocks Working Group 2007a; Northeast Data Poor Stocks Working Group 2007b; Sosebee et al. 2008; NEFSC 2006a.

6.4 Protected Resources

6.4.1 Species Present in the Area

Numerous protected species inhabit the environment within the Northeast Multispecies FMP management unit (Table 20). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA).

Table 20 - Species Protected Under the Endangered Species Act and/or Marine Mammal Protection Act that May Occur in the Operation Area for the Northeast Multispecies Fishery

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

Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected	Yes
Gray seal (*Halichoerus grypus*)	Protected	Yes
Harp seal (*Phoca groenlandicus*)	Protected	Yes
Hooded seal (*Cystophora cristata*)	Protected	Yes

Notes:

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

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

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

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

In addition to those species described in Table 20, two candidate species occur in the affected environment of the multispecies fishery: cusk (*Brosme brosme*) and dusky shark (*Carcharhinus obscurus*). Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA, and also include those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. Candidate species receive no substantive or procedural protection under the ESA, and therefore, these species will not be discussed further in this document. However, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project.

6.4.2 Species and Critical Habitat Not Likely to be Affected by the Proposed Action

Based on available information, it has been determined that this action is not likely to affect shortnose sturgeon, hawksbill sea turtles, blue whales, or sperm whales. Further, this action is not likely to adversely affect Atlantic salmon, the Northwest Atlantic DPS of loggerhead or North Atlantic right whale critical habitats. The following discusses the rationale for these determinations.

Shortnose Sturgeon

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. They occupy rivers along the western Atlantic coast from St. Johns River in Florida, 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 2010a). Given the range of the species (remaining mostly in the river systems, with some coastal migrations between rivers), and the fact that the multispecies fishery will not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, direct (e.g., interaction with gear) and indirect (e.g., prey removal, habitat modification) impacts to shortnose sturgeon are not expected. In addition, interactions with shortnose sturgeon have never been documented from the multispecies fishery (Northeast Fisheries Observer Program database). Based on this information, it is extremely unlikely that the proposed action will affect shortnose sturgeon.

Hawksbill Sea Turtle

The hawksbill turtle is uncommon in the waters of the continental U.S. Although there are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts, east coast sightings north of Florida are rare (NMFS and USFWS 1993). Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America, and prefer nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. As the multispecies fishery will not occur in waters that are typically used by hawksbill sea turtles, direct (e.g., interaction with gear) and indirect (e.g., prey removal, habitat modification) impacts to hawksbills are not expected. Based on this information, it is extremely unlikely that the proposed action will affect hawksbill sea turtles.

Blue Whale

Blue whales do not regularly occur in waters of the U.S. EEZ, and all calving for the species occurs in low latitude waters (Waring *et al*. 2010). During the Cetacean and Turtle Assessment Program surveys of the mid- and North Atlantic areas of the outer continental shelf, no blue whales were observed (Cetacean and Turtle Assessment Program 1982). There has also been no observed fishery-related mortalities or serious injuries to blue whales to date (Waring *et al*. 2010). Based on this information, and the fact that the multispecies fishery will not overlap with blue whale occurrence or habitat, direct (e.g., interaction with gear) or indirect (e.g., prey removal, habitat modification) effects to blue whales from the proposed action are not expected.

Sperm Whale

Sperm whales regularly occur in waters of the U.S. EEZ. However, the distribution of the sperm whales in the U.S. EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring *et al*. 2014). The average depth over which sperm whale sightings occurred during the Cetacean and Turtle Assessment Program surveys was 1,792 meters (Cetacean and Turtle Assessment Program 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 1,000 meters and at latitudes less than 40° N (Whitehead 2002). In contrast, the multispecies fishery will operate in shallower continental shelf waters, and thus, sperm whales are unlikely to occur in water depths where the multispecies fishery will operate. Based on this information, and the fact that there have been no observed fishery-related mortalities or serious injuries to sperm whales (Waring *et al*. 2014), we do not expect any direct (e.g., interaction with gear) or indirect (e.g., prey removal, habitat modification) impacts to sperm whales from the proposed action.

North Atlantic Right Whale Critical Habitat

Critical habitat for right whales has been designated in the Atlantic Ocean in Cape Cod Bay, Great South Channel, and in nearshore waters off Georgia and Florida (50 CFR 226.13). Cape Cod Bay and Great South Channel, which are located within the affected environment of the multispecies fishery, were designated as critical habitat for right whales due to their importance as spring/summer foraging grounds for the species. What makes these two areas so critical is the presence of dense concentrations of copepods. The multispecies fishery will not affect the availability of copepods for foraging right whales because copepods are very small organisms that will pass through multispecies fishing gear (e.g., bottom trawls, gillnets) rather than being captured in it. The multispecies fishery will also not affect critical habitat designated off of Georgia or Florida as it is located outside of the area where the multispecies fishery operates. Since the multispecies fishery is not likely to affect the availability of copepods, and these are the biological feature that characterized Cape Cod Bay and the Great South Channel as critical (feeding) habitat, the proposed action is not likely to adversely affect designated critical habitat for right whales and, therefore, will not be considered further in this document.

Northwest Atlantic Distinct Population Segment (DPS) of Loggerhead Sea Turtle DPS Critical Habitat

NMFS issued a final rule to designate critical habitat for the Northwest Atlantic Ocean DPS of the loggerhead sea turtle within the Atlantic Ocean and the Gulf of Mexico on July 10, 2014 (79 FR 39856). Specific areas for designation include 38 occupied marine areas within the range of the Northwest Atlantic Ocean DPS. These areas contain one or a combination of habitat types: Nearshore reproductive habitat, winter area, breeding areas, constricted migratory corridors, and/or Sargassum habitat. Constricted migratory corridors and/or winter critical habitat has been designated from 33'30^{o}N to 36^{o}N; the remaining critical habitat has been designated south of 35^{o}N. As the multispecies fisheries southern extent is 35^{o}N, a small portion of the designated constricted migratory corridor and winter critical habitat will occur in the operational area of the fishery.

The constricted migratory corridor off North Carolina serves as a concentrated migratory pathway for loggerheads transiting to neritic foraging areas in the north, and back to winter, foraging, and/ or nesting areas in the south. The majority of loggerheads pass through this migratory corridor in the spring (April to June) and fall (September to November), but loggerheads are also present in this area from April through November and, given variations in water temperatures and individual turtle migration patterns, these time periods are variable. The primary constituent elements of winter critical habitat are: (1) Water temperatures above 10° C from November through April; (2) Continental shelf waters in proximity to the western boundary of the Gulf Stream; and (3) Water depths between 20 and 100 m. As the multispecies fishery will not modify the physical characteristics of either designated critical habitat or interfere with sea turtles continued use of these essential areas, the multispecies fishery is not expected to result in any adverse impacts to the sea turtle constricted migratory corridor or winter critical habitats. As all other designated critical habitat is outside of the range of the multispecies fishery, effects to these areas will not be experienced by the fishery or the proposed action. For these reasons, the Northwest Atlantic DPS of loggerhead sea turtle critical habitat will not be considered further in this document

Atlantic Salmon Critical Habitat

NMFS issued a final rule designating critical habitat for the Atlantic salmon (*Salmo salar*) Gulf of Maine Distinct Population Segment (GOM DPS) on June 19, 2009 (74 FR 29300). NMFS designated as critical habitat 45 specific areas occupied by Atlantic salmon at the time of listing that comprise approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS in which critical habitat is designated is within the State of Maine. Specific areas within the marine environment where Atlantic salmon occur were not designated as critical habitat because the specific physical and biological features that are essential to the conservation of the species could not be identified at the time salmon were listed. Subsequently it is unlikely that the proposed action will have an adverse effect on Atlantic salmon's designated Critical Habitat and therefore, will not be considered further in this document.

6.4.3 Species Potentially Affected by the Proposed Action

The multispecies fishery may affect multiple protected species of cetacean, sea turtles, pinnipeds, and fish (see Table 20). Of primary concern is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species. To understand the potential risk of an interaction, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) records of protected species interaction with particular fishing gear types. Information on species occurrence in the affected environment of the multispecies fishery will be presented in this section (1.1.3), while information on protected species interactions with fishery gear will be presented in Section 1.1.4.

6.4.3.1 Sea Turtles

Status and Trends

Table 21 includes the four ESA listed species of sea turtles that occur in the affected environment of the multi-species fisheries. Three of the four species are considered hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status of the other four species, as well as a description and life history of the species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant *et al.* 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS *et al.* 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

Table 21 - Sea turtle species found in the affected environment of the multispecies fishery

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

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

Occurrence and Distribution

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

Hard-shelled sea turtles

Distribution

In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Shoop and Kenney 1992; Epperly *et al.* 1995a, 1995b;

Braun and Epperly 1996; Mitchell *et al.* 2003; Braun-McNeill *et al.* 2008; TEWG 2009). While hard-shelled turtles are most common south of Cape Cod, MA, loggerhead sea turtles are known to occur in the Gulf of Maine (GOM), feeding as far north as southern Canada. Loggerheads have been observed in waters with surface temperatures of 7°C to 30°C, but water temperatures ≥11°C are most favorable (Shoop and Kenney 1992; Epperly *et al.* 1995b). Sea turtle presence in U.S. Atlantic waters is also influenced by water depth. While hard-shelled turtles occur in waters from the beach to beyond the continental shelf, they are most commonly found in neritic waters of the inner continental shelf (Mitchell *et al.* 2003; Braun-McNeill and Epperly 2004; Morreale and Standora 2005; Blumenthal *et al.* 2006; Hawkes *et al.* 2006; McClellan and Read 2007; Mansfield *et al.* 2009; Hawkes *et al.* 2011; Griffin *et al.* 2013).

Seasonality

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

Leatherback sea turtles

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

6.4.3.2 Large Cetaceans

Status and Trends

Table 22 provides the species of large whales that occur in the affected environment of the multispecies fisheries. For additional information on the biology, status, and range wide distribution of each whale species please refer to: Waring *et al*. 2014; NMFS 1991, 2005, 2010b, 2011, 2012.

Table 22 - Large whale species in the affected environment of the multispecies fishery

Species	Listed Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock[1]
North Atlantic Right Whale	Yes-Endangered	Yes	454	positive and slowly accelerating	Yes
Humpback	Yes-	Yes	823	positive	Yes

Species	Listed Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock[1]
Whale	Endangered				
Fin Whale	Yes-Endangered	Yes	2,817	unknown	Yes
Sei Whale	Yes-Endangered	Yes	236	unknown	Yes
Minke Whale	No	Yes	16,199	unknown	No

Notes: [1]A strategic stock is defined under the MMPA as a marine mammal stock: for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

Source: Waring *et al*. 2014

Occurrence and Distribution

Right, humpback, fin, sei, and minke whales are found throughout the waters of the Northwest Atlantic Ocean. In general, these species follow an annual pattern of migration between low latitude (south of 35°N) wintering/calving grounds and high latitude spring/summer foraging grounds (primarily north of 41°N; Waring *et al*. 2014; NMFS 1991, 2005, 2010b, 2011, 2012). This, however, is a simplification of whale movements, particularly as it relates to winter movements. It remains unknown if all individuals of a population migrate to low latitudes in the winter, although, increasing evidence suggests that for some species (e.g., right and humpback whales), some portion of the population remains in higher latitudes throughout the winter (Waring *et al*. 2014; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; Cole *et al*. 2013; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the distribution and movements of large whales to foraging grounds in the spring/summer is well understood. Movements of whales into higher latitudes coincide with peak productivity in these waters. As a result, the distribution of large whales in higher latitudes is strongly governed by prey availability and distribution, with large numbers of whales coinciding with dense patches of preferred forage (Mayo and Marx 1990; Kenney *et al*. 1986, 1995; Baumgartner *et al*. 2003; Baumgartner and Mate 2003; Payne *et al*.1986, 1990; Brown *et al.* 2002; Kenney 2001; Payne *et al.* 1990; Schilling *et al.* 1992). It is important to note, these foraging areas are consistently returned annually, and therefore, can be considered important, high use areas for whales.

As the affected area of the multi-species fishery occurs in waters north of 35°N, and whales may be present in these waters throughout the year, the multispecies fisheries and large whales are likely to co-occur in the affected area. To further assist in understanding how the multi-species fisheries overlaps in time and space with the occurrence of large whales, a general overview on species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery is provided in the following table (Table 23). For additional information on the biology, status, and range wide distribution of each whale species please refer to: Waring *et al*. 2014; NMFS 1991, 2005, 2010b, 2011, 2012.

Table 23 - Large cetacean occurrence in the Gulf of Maine (GOM), Georges Bank (GB), Southern New England (SNE), and Mid-Atlantic sub-regions of the multi-species fisheries[1]

Species	Prevalence in Affected Area	High Use Areas and Approximate Months of Occurrence (if known)
North Atlantic Right Whale	• Distributed throughout all continental shelf waters of the Mid-Atlantic, GOM, GB, and SNE sub-regions throughout the year. • Regularly move through the waters off the Mid-Atlantic states, including New Jersey, New York, Rhode Island, and Southern Massachusetts (migratory corridor to/from feeding and calving grounds; primarily November through April). • Winter through summer (approximately December/January-July 31): Distributed in greatest densities in GOM and GB sub-regions (foraging grounds). • Increasing evidence of wintering areas (approximately November – January) in Cape Cod Bay; GOM (e.g., Jeffreys and Cashes Ledges, Jordan Basin); and Massachusetts Bay (e.g., Stellwagen Bank).	• Approximately April-July: Great South Channel and GB (foraging grounds) • Approximately January through May: Cape Cod and Massachusetts Bays (foraging grounds) • Approximately March through April: waters off the eastern shore of Cape Cod (foraging grounds)
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic, GOM, GB, and SNE sub-regions throughout the year. • Regularly move through the waters off the Mid-Atlantic states, including New Jersey, New York, Rhode Island, and Southern Massachusetts throughout the year (migratory corridor to/from feeding and calving grounds). • Spring through fall (approximately March through November), distributed in greatest densities in the GOM and GB sub-regions (foraging grounds). • Increasing evidence of wintering areas (for juveniles) in the Mid-Atlantic (e.g., waters in the vicinity of Chesapeake and Delaware Bays; peak presence approximately January through March)	From approximately March through November: • GOM • Massachusetts (esp. Stellwagen Bank) and Cape Cod Bays • GB
Fin	• Distributed throughout all continental shelf waters of the Mid-Atlantic, GOM, GB, and SNE sub-regions throughout the year. • Regularly move through the waters off the Mid-Atlantic states, including New Jersey,	From approximately March through August: • Massachusetts Bay (esp. Stellwagen Bank) • Great South Channel

Species	Prevalence in Affected Area	High Use Areas and Approximate Months of Occurrence (if known)
	New York, Rhode Island, and Southern Massachusetts (migratory corridor to/from feeding and calving grounds). • Spring through fall (approximately March through August): distributed in greatest densities in the GOM and GB sub-regions; lower densities are found in these regions in the fall (approximately September-November). • Evidence of wintering areas in mid-shelf areas east of New Jersey, Stellwagen Bank; and eastern perimeter of GB.	• Waters off Cape Cod (~40-50 meter contour) • western GOM (esp. Jeffrey's Ledge) • Eastern perimeter of GB • Mid-shelf area off the east end of Long Island.
Sei	• Uncommon in shallow, inshore waters of the Mid-Atlantic, SNE, GB, and GOM sub-regions; however, occasional incursions during peak prey availability and abundance. • Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks • Spring through summer, found in greatest densities in offshore waters of the GOM and GB sub-regions.	Throughout the spring and summer: • GOM • GB (esp. eastern and southwestern edge (Hydrographer Canyon) into Northeast Channel
Minke	Spring through fall found in greatest densities in the GOM and GB sub-regions	From approximately March through December (peak=July through October): • Massachusetts Bay (esp. Stellwagen Bank) • Cape Cod Bay • GOM

Notes:
[1] Information presented in table is representative of large cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 meter isobath.

Sources: NMFS 1991, 2005, 2010b, 2011, 2012; Hain *et al.* 1992; Payne 1984; Hamilton and Mayo 1990; Schevill *et al*. 1986; Watkins and Schevill 1982; Payne *et al*.1990; Winn et al. 1986; Kenney et al. 1986, 1995; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; 50 CFR 224.105; CETAP 1982; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012; Baumgartner *et al*. 2011; Cole *et al*. 2013; Risch *et al*. 2013; Waring *et al*. 2014.

6.4.3.3 Small Cetacean

<u>Status and Trends</u>

Table 24 provides the species of small cetaceans that occur in the affected environment of the multispecies fisheries. For additional information on the biology, status, and range wide distribution of each small cetacean species please refer to Waring *et al*. 2014.

Table 24 - Small cetacean species that occur in the affected environment of the multispecies fishery

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

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

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

Source: Waring *et al*. 2014

Occurrence and Distribution

Small cetaceans are found throughout the waters of the Northwest Atlantic Ocean. In the affected area, they can be found throughout the year from Cape Hatteras, North Carolina (35^{o}N), to the Canadian border (Waring *et al*. 2014). Within this range; however, there are seasonal shifts in species distribution and abundance. As the affected area of the multi-species fishery occurs in waters north of 35^{o}N, and small cetaceans may be present in these waters throughout the year, the multispecies fisheries and small cetaceans are likely to co-occur in the affected area. To further assist in understanding how the multi-species fisheries overlaps in time and space with the occurrence of small cetaceans, a general overview of species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery is provided in the following table (Table 25). For additional information on the biology, status, and range wide distribution of each species please refer to Waring *et al*. 2014,

Table 25 - Small cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries[1]

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

Species	Prevalence and Approximate Months of Occurrence (if known)
Risso's Dolphin	• Common in the continental shelf edge waters of the Mid-Atlantic, SNE, and GB sub-regions; rare in the GOM sub-region. • From approximately March-November: distributed along continental shelf edge from Cape Hatteras, NC, to GB. • From approximately December-February: distributed in continental shelf edge of the Mid-Atlantic (SNE and Mid-Atl. sub-regions).
Harbor Porpoise	• Distributed throughout the continental shelf waters (primarily in waters less than 150 meters) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions. • Seasonal shifts in distribution: *__July-September__: Concentrated in the northern GOM; low numbers can be found on GB. *__October-December__: widely dispersed in waters from New Jersey to Maine. *__January-March__: intermediate densities in waters off New Jersey to North Carolina (SNE and Mid-Atl sub-regions); low densities found in waters off New York to GOM. *__April-June__: widely dispersed from New Jersey to Maine
Bottlenose Dolphin:	**Western North Atlantic Offshore Stock** • Spring-Summer: Primarily distributed along the outer continental shelf/edge-slope of the Mid-Atlantic, SNE, and GB sub-regions • Winter: Distributed in waters south of 35°N **Western North Atlantic Northern Migratory Stock** • Summer (July-August): distributed from the coastal waters from the shoreline to approximately the 25-m isobaths between the Chesapeake Bay mouth and Long Island, New York (Mid-Atl and SNE sub-regions). • Winter (January-March): Distributed in coastal waters south of 35°N. **Western North Atlantic Southern Migratory Stock** • Spring and Summer (April-August): distributed along coastal waters from North Carolina to Virginia (Mid-Atl and SNE sub-regions). • Fall and Winter (October-March): Distributed in coastal waters south of 35°N.
Pilot Whales: *Short- and Long-Finned*	**Short- Finned Pilot Whales** • Primarily occur south of 40°N (Mid-Atl and SNE sub-regions); although low numbers have been found along the southern flank of GB, but no further than 41°N. • Distributed primarily in the continental shelf edge-slope waters of Mid-Atlantic and SNE sub-regions from approximately May through December, with individuals moving to more southern

Species	Prevalence and Approximate Months of Occurrence (if known)
	waters (i.e., 35°N and south) beginning in the fall. **Long-Finned Pilot Whales** • Range from 35°N to 44°N • Winter to early spring (approximately November through April): primarily distributed along the continental shelf edge-slope of the Mid-Atlantic, SNE, and GB sub-regions. • Late spring through fall (approximately May through October): movements and distribution shift onto/within GB, the Great South Channel, and the GOM. **Area of Species Overlap:** between 38°N and 40°N (Mid-Atl and SNE sub-regions)
Notes: [1] Information presented in table is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 meter isobath. *Sources*: Waring *et al*. 1992, 2007, 2014; Payne and Heinemann 1993; Payne 1984; Jefferson *et al*. 2009.	

6.4.3.4 Pinnipeds

Status and Trends

Table 26 provides the species of pinnipeds that occur in the affected environment of the multispecies fisheries. For additional information on the biology, status, and range wide distribution of each pinniped species please refer to Waring *et al*. 2014.

Table 26 - Pinniped species that occur in the affected environment of the multispecies fishery

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

Occurrence and Distribution

Pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. In the affected area, they are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N) (Waring *et al*. 2007, 2014). As the affected area of the multi-species fishery occurs in waters north of 35°N, and pinnipeds may be present in these waters throughout the year, the multispecies fisheries and pinnipeds are likely to co-occur in the affected area. To further assist in understanding how the multi-species fisheries overlaps in time and space with the occurrence of pinnipeds, a general overview of species occurrence and distribution in the affected environment of the multispecies fishery is provided in the following table (Table 27). For additional information on the biology, status, and range wide distribution of each species of pinniped please refer to Waring *et al*. 2007, 2014.

Table 27 - Pinniped occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries

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

6.4.3.5 Atlantic Sturgeon

Status

Table 28 lists the 5 DPSs of Atlantic sturgeon likely to occur in the affected area. For additional information on the biology, status, and range wide distribution of each distinct population segment please refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007).

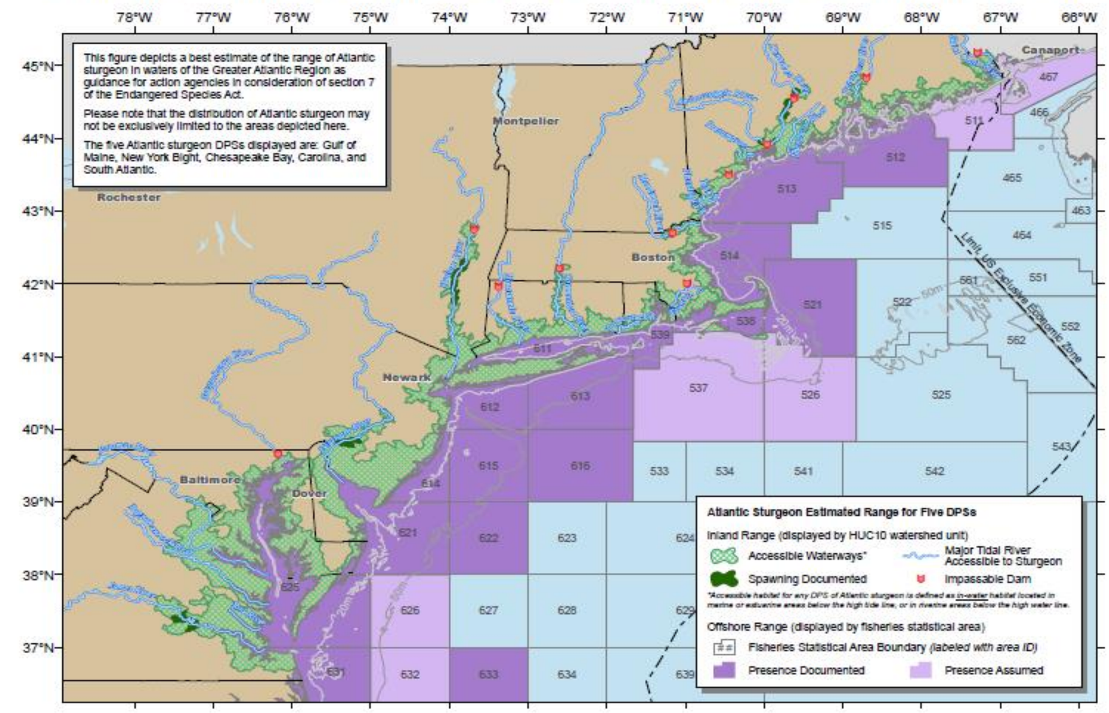
Table 28 - Atlantic Sturgeon DPSs occurring in the affected environment of the multispecies fishery

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

Occurrence and Distribution

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (See Figure 9; ASSRT 2007; Dovel and Berggren 1983; Dadswell *et al*. 1984; Kynard *et al*. 2000; Stein *et al*. 2004a; Dadswell 2006; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011; Wirgin *et al*. 2012; O'Leary *et al*. 2014; Waldman *et al.* 2013).

Figure 9 - Estimated Range of Atlantic Sturgeon Distinct Population Segments (DPSs)



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

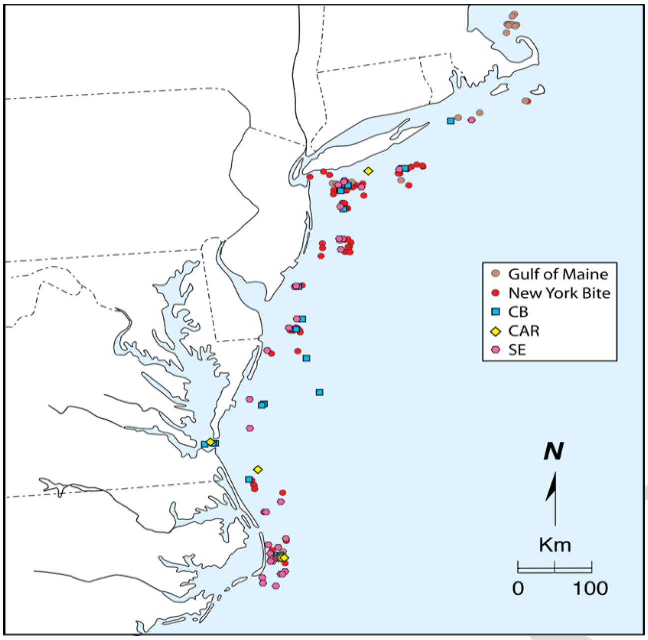
Based on fishery- independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein *et al*. 2004 a,b; Erickson *et al*. 2011; Dunton *et al*. 2010); however,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

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

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

In addition, since listing of the five Atlantic sturgeon DPSs, several genetic studies have occurred to address DPS distribution and composition in marine waters. Genetic analysis has been conducted on Atlantic sturgeon captured (fishery-independent) from aggregations in Long Island Sound and the Connecticut River (summer aggregations; Waldman *et al*. 2013), as well as the New York Bight, specifically the coastal waters off the Rockaway Peninsula (spring and fall aggregations; O'Leary *et al*. 2014). Results from these studies showed that these aggregations, regardless of location, were comprised of all 5 DPSs, with the NYB DPS consistently identified as the main contributor of the mixed aggregations, followed by the GOM, CB, SA, and Carolina DPSs. In a similar assessment, genetic analysis was conducted on Atlantic sturgeon captured (fishery-dependent) during the Northeast Fisheries Observer Program and At Sea Monitoring Program, which ranges from Maine to North Carolina. Results from this assessment affirmed that in waters of the Mid-Atlantic, all 5 DPSs co-occur (Figure 10), with the percentage of each DPS estimated to be as follows: 51% NYB DPS; 22% SA DPS; 13 % CB DPS; 11% GOM DPS; 2 % Carolina DPS; and 1 % Canadian stock (Damon-Randall *et al*. 2013); however, these results have not been examined relative to the amount of observed fishing effort throughout the area. In a study by Wirgin *et al*. 2012, genetic analysis revealed that the summer assemblage of Atlantic sturgeon in Minas Basin, Inner Bay of Fundy, Canada, was comprised not only of Canadian origin Atlantic sturgeon, but also Atlantic sturgeon from the GOM DPS (34-64% contribution to the mixed assemblage) and NYB DPS (1-2% contribution to the mixed assemblage). Although additional studies are needed to further clarify the DPS distribution and composition in non-natal estuaries and coastal locations, these studies provide some initial insight on DPS distribution and co-occurrence in particular areas along the U.S. eastern sea board.

Figure 10 - Capture locations and DPS of origin assignments for Observer Program specimens (n=173)



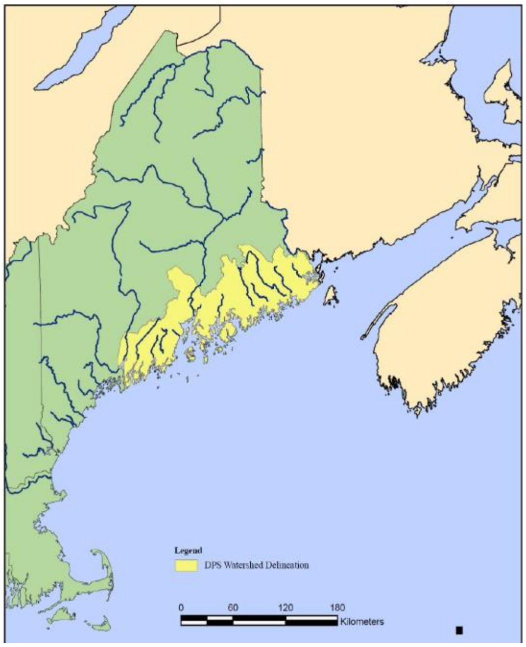
Source: Map provided by Dr. Isaac Wirgin; Damon-Randall *et al*. 2013

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

6.4.3.6 Atlantic Salmon (Gulf of Maine DPS)

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River (Figure 11), while the marine range of the GOM DPS extends from the GOM (primarily northern portion of the GOM), to the coast of Greenland (NMFS and USFWS 2005; Fay *et al*. 2006). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay *et al*. 2006; USASAC 2004; Hyvarinen *et al.* 2006; Lacroix and McCurdy 1996; Lacroix *et al.* 2004, 2005; Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993, Sheehan *et al.* 2012; NMFS and USFWS 2005; Fay *et al*. 2006). For additional information on the on the biology, status, and range wide distribution of the GOM DPS of Atlantic salmon please refer to NMFS and USFWS 2005; Fay *et al*. 2006.

Figure 11. Geographic range of the Gulf of Maine DPS of Atlantic salmon



Source: NMFS and USFWS 2005

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

6.4.4 Interactions Between Gear and Protected Resources

Protected species described in Section 1.1.3 are all known to be vulnerable to interactions with various types of fishing gear. In the following sections, available information on gear interactions with a given species (or species group) will be provided. Please note, these sections are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on those gear types that are known to pose the greatest risk to the species under consideration.

6.4.4.1 Marine Mammals

Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery.[5] The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.

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

[5] The most recent LOF was issued August 25, 2014; 79 FR 50589.

- **Tier 1-** considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are less than or equal to ten percent of the stock's potential biological removal rate (PBR), all fisheries associated with this stock fall into Category III.[6] -If mortality and serious injury rates are greater than ten percent of PBR, the following Tier 2, analysis occurs.

- **Tier 2 -**considers fishery-specific mortality and serious injury for a particular stock. Specifically, this analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR to designate the fishery as a Category I, II, or III fishery (see Table 29).

Table 29 - Descriptions of the Tier 2 Fishery Classification Categories (50 CFR 229.2)

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

Please note, in this EA, the following discussion on fishery interactions with marine mammals (large cetaceans, and small cetaceans and pinnipeds) are in reference to the Tier 2 classifications of fisheries in Table 29.

6.4.4.1.1 Large Cetaceans

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel and breed in many of the same ocean areas utilized for commercial fishing. The greatest entanglement risk to large whales is posed by fixed fishing gear (e.g., sink gillnet and trap/pot gear) comprised of lines (vertical or ground) that rise into the water column. Any line can become entangled in the mouth (baleen), flippers, and/or tail of the whale when the animal is transiting or foraging through the water column (Johnson *et al*. 2005; NMFS 2014; Kenney and Hartley 2001; Hartley *et al*. 2003; Whittingham *et al*. 2005a,b; Waring *et al.* 2014). For instance, in a study of right and humpback whale entanglements, Johnson *et al*. 2005 attributed: (1) 89% of entanglement cases, where gear could be identified, to fixed gear consisting of pot and gillnets and (2) entanglement of one or more body parts of large whales (e.g., mouth and/or tail regions) to four different types of line associated with fixed gear (the buoy line, groundline, floatline, and surface system lines).[7] Although available data, such as Johnson *et al*.2005, provides insight into large whale entanglement risks with fixed fishing gear, to date, due to uncertainties surrounding the nature of the entanglement event, as well as unknown biases associated with reporting

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

[7] Buoy line connects the gear at the bottom to the surface system. Groundline in trap/pot gear connects traps/pots to each other to form trawls; in gillnet gear, groundline connects a gillnet or gillnet bridle to an anchor or buoy line. Floatline is the portion of gillnet gear from which the mesh portion of the net is hung. The surface system includes buoys and high-flyers, as well as the lines that connect these components to the buoy line.

effort and the lack of information about the types and amounts of gear being used, determining which part of fixed gear creates the most entanglement risk for large whales is difficult (Johnson *et al.* 2005). As a result, any type or part of fixed gear is considered to create an entanglement risk to large whales and should be considered potentially dangerous to large whale species (Johnson *et al.* 2005).

The effects of entanglement to large whales range from no injury to death (NMFS 2014; Johnson *et al*. 2005; Angliss and Demaster 1998; Moore and Van der Hoop 2012). "When… [whales] become fouled in gear, normal breathing and movement may be impaired or stopped completely. If the animal does manage to struggle free, portions of gear may remain attached to the body. This trailing gear, often made of durable synthetic material, may create excess drag, snag onto objects in the environment and impede normal behavior like breathing, feeding, movement, or breeding. Other effects include infections and deformations" (quote from Center for Coastal Studies, May 14, 2003, in NMFS 2014; Moore and Van der Hoop 2012). Considering these factors, the risk of injury or death in the event of an entanglement may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables (NMFS 2014). Although the interrelationships among these factors are not fully understood, and the data needed to provide a more complete characterization of risk are not available, to date, available data does indicate that the entanglement in fishing gear is a significant source of serious injury or mortality for Atlantic large whales (Table 11; Waring *et al*. 2014).

As described in Section 1.1.3 (Species Potentially Affected), there are four species of large whales likely to occur in the affected area of the multispecies fishery: North Atlantic right whale; humpback whale; fin whale; and minke whale. Table 30 summarizes all known serious injury and fatal entanglements of humpback, fin, sei, minke, and North Atlantic right whales from 1997 to 2011 (NMFS 2014; Waring *et al*. 2014). The entanglement data comes from the 2014 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Report and pertains only to entanglements that the National Marine Fisheries Service considers to be the primary cause of serious injury or death to a whale (Waring *et al*. 2014).[8] In addition, only entanglement data from U.S. waters is presented.

[8] NMFS defines serious injury as an "injury that is more likely than not to result in mortality" (Waring *et al.* 2014).

Table 30 - Summary of confirmed serious injury and mortality of fin, minke, humpback, sei, and North Atlantic right whales from 1997-2011 due to fisheries entanglements.

Species	Total Confirmed Serious Injury Cases from 1997-2011	Total Confirmed Mortality Cases from 1997-2011	Annual Fishing Mortality, U.S. Waters Only[1]	Potential Biological Removal (PBR)
North Atlantic Right Whale	15	9	1.6	0.9
Humpback Whale	40	20	4	2.7
Fin Whale	4	8	0.8	5.6
Sei Whale	1	0	0.07	0.5
Minke Whale	6	34	2.7	162

Notes: [1] "Annual Fishing Mortality" refers to mortality and serious injury resulting from large whale interactions with commercial fisheries.

Sources: NMFS 2014; Waring *et al*. 2014.

As many entanglement events go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, it is important to recognize that the information presented in Table 30 likely underestimates the rate of large whale serious injury and mortality due to entanglement. Further, scarring data suggests that entanglements may be occurring more frequently than the observed incidences indicate (i.e., Table 30; NMFS 2014). For instance, a study conducted by Robbins (2009) analyzed entanglement scars observed in photographs taken during 2003-2006. This analysis suggests high rates of entanglements of GOM humpback whales in fishing gear. In an analysis of the scarification of right whales, 519 of 626 (82.9%) whales examined during 1980-2009 were scarred at least once by fishing gear (Knowlton *et al*. 2012). Further research using the North Atlantic Right Whale Catalogue has indicated that, annually, between 8.6% and 33.6% of right whales have been involved in entanglements (Knowlton *et al*. 2012). Based on this information, care should be taken when interpreting entanglement data as it is likely more incidences of entanglement are occurring than observation alone indicates.

As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the (Northwest) Atlantic Ocean. As humpback, fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA (see Section 1.1.3 Species Potentially Affected). Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan (TRP) for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP or Plan)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[9] In 1997, the ALWTRP was implemented; however, since 1997, the Plan has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In fact, two recent adjustments include the "Sinking Groundline Rule," that became effective in April 2009 (September 2, 2008; 73 FR 51228), and the "Vertical Line Rule," that became effective August 26, 2014 (June 27, 2014; 79 FR 36586).[10]

Broadly speaking, the Plan consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries (http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/; 73 FR 51228; 79 FR 36586). Specifically, the Plan identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in the Northeast, Mid-Atlantic, and Southeast regions of the U.S.; these fisheries must comply with all regulations of the Plan.[11]

The following table (Table 31) provides a brief summary of the specified gear modification requirements and restrictions under the ALWTRP for trap/pot or gillnet fisheries in the Northeast or Mid-Atlantic region of the U.S. As the affected environment of the proposed action will not extend into the Southeast region, those provisions of the Plan will not be discussed further. For further details on the gear modification requirements and restrictions under the ALWTRP please see: http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/

[9] The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.

[10] The most recent rule (Vertical Line Rule) focused on trap/pot vertical line reduction as the ALWTRT determined that gillnets represent less than 1% of the total vertical lines on the east coast and that the impacts from this gear on large whales is minimal (see Appendix 3A, NMFS 2014); however, even with the new Rule, gear will still be subject to existing restrictions under the ALWTRP for gillnet gear.

[11] The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet (NMFS 2014).

Table 31 - Summary of gear modification requirements and restrictions for the Northeast and Mid-Atlantic Trap/Pot and Gillnet Fisheries under the Atlantic Large Whale Take Reduction Plan.

Fishery	Gear Modification Requirement and Restrictions
Trap/Pot	**<u>Northeast and Mid-Atlantic</u>** • Trap/Pot Universal Requirements • Trap/Pot Weak Link Requirements • Trap/Pot Gear Marking Requirements **<u>Northeast</u>** • Minimum Number of Traps per Trawl Requirement • Minimum Number of Traps per Trawl Requirement Exemption (NH state waters; ¼ mile within Mohegan Island; Matinicus Island; and Ragged Island, Maine).
Gillnet	**<u>Northeast and Mid-Atlantic</u>** • Gillnet Universal Requirements • Gillnet Gear Marking Requirements • Gillnet Weak Link Requirements • Anchored Gillnet Anchoring Requirements • Drift Gillnet Night Fishing & Storage Restrictions

Except for the universal gear requirements, the additional gear modification requirements and restrictions identified in Table 31 will vary by location (i.e., management areas) and dates. The following table (Table 32) and figures (Figure 12 and Figure 13) provide the Management Areas recognized by the ALWTRP in the Northeast and Mid-Atlantic; for details on the specific gear modification requirements and restrictions in each Management Area please see http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/

Table 32 - Northeast and Mid-Atlantic Gillnet or Trap/Pot Management Areas under the Atlantic Large Whale Take Reduction Plan

Fishery	Management Areas
Northeast Trap/Pot	• Northern Inshore State Trap/Pot Waters • Massachusetts Restricted Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Great South Channel Restricted Trap/Pot Area • Northern Nearshore Trap/Pot Waters • Southern Nearshore Trap/Pot Waters (Northeast) • Offshore Trap/Pot Waters (Northeast)
Northeast Gillnet	• Cape Cod Bay Restricted Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Great South Channel Restricted Gillnet Area • Other Northeast Gillnet Waters (Northeast)
Mid-Atlantic Trap/Pot	• Southern Nearshore Trap/Pot Waters • Offshore Trap/Pot Waters (Mid-Atlantic)
Mid-Atlantic Gillnet	• Other Northeast Gillnet Waters (Mid-Atlantic) • Mid/South Atlantic Gillnet Waters

Figure 12 - Summary of Trap/Pot Management Area under the Atlantic Large Whale Take Reduction Plan

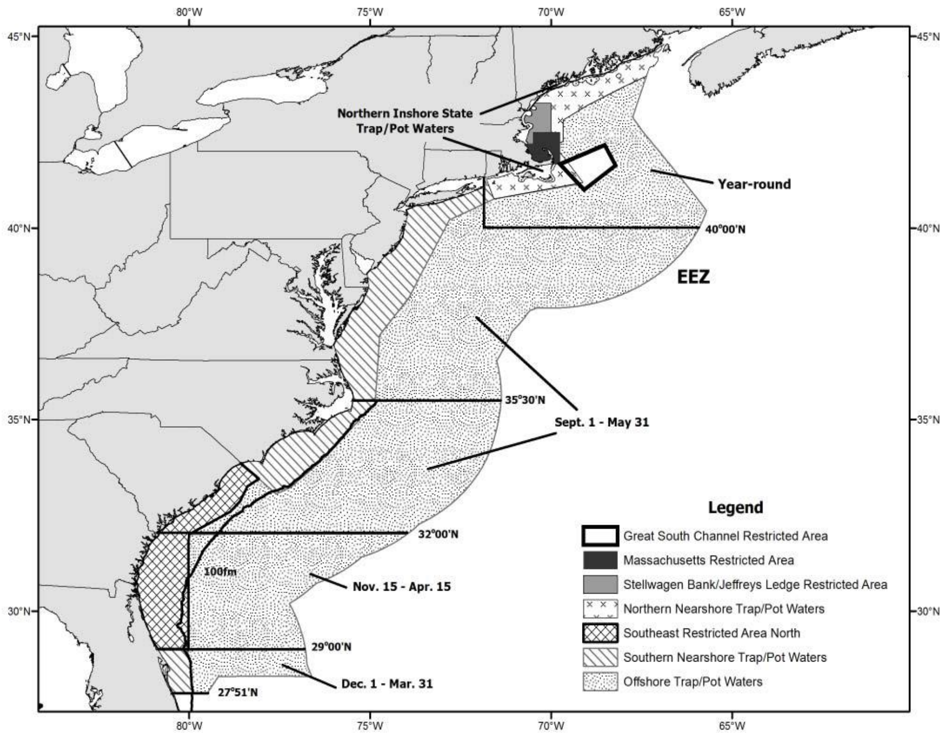
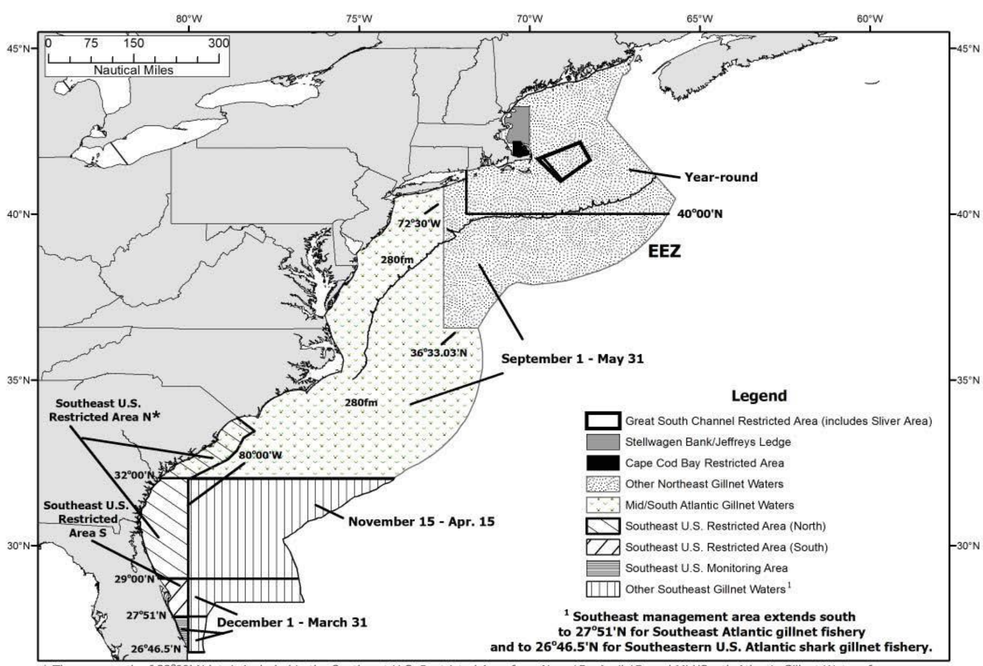


Figure 13 - Summary of Gillnet Management Areas under the Atlantic Large Whale Take Reduction Plan



* The area north of 32°00' N lat. is included in the Southeast U.S. Restricted Area from Nov. 15 - April 15, and Mid/South Atlantic Gillnet Waters from Sept. 1 - Nov. 14 and April 16 - May 31.

6.4.4.1.2 Small Cetaceans and Pinnipeds

Small cetaceans and pinnipeds are found throughout the waters of the Northwest Atlantic (see Section 1.1.3). As they feed, travel and breed in many of the same ocean areas utilized for commercial fishing, they are at risk of becoming entangled or bycaught in various types of fishing gear (see Table 14), with interactions resulting in serious injury or mortality to the animal. As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Table 33 provides information on the Category I and II fisheries that occur in the affected environment of the multispecies fishery, and the small cetacean and pinniped species that have been observed incidentally injured and/or killed by these fisheries. Information is also provided on the most recent mean annual mortality estimates for those species observed incidentally injured/killed in the fishery from 2007-2011.[12] Please note, Table 14 does not provide a comprehensive list of all species affected by each fishery, it only addresses those species that occur in the affected environment of the multispecies fishery (see Section 1.1.3). For a comprehensive list of species affected by each category of fishery, please see the recently issued LOF.

Table 33 - Small cetacean and pinniped species observed seriously injured and/or killed by Category I, II, and III fisheries in the affected environment of the multispecies fishery. A (1) indicates those species driving the fisheries classification.

Category I			
Fishery	**Species Observed Injured/Killed**	**Observed in 2007-2011**	**Mean Annual Mortality[1]**
Northeast Sink Gillnet	Bottlenose dolphin (offshore)	N	N/A
	Harbor porpoise (1)	Y	462
	Atlantic white sided dolphin	Y	33
	Short-beaked common dolphin	Y	41
	Pilot whale	Y	1
	Harbor seal	Y	346
	Gray seal	Y	1,043
	Harp seal	Y	208
Mid-Atlantic Gillnet	Bottlenose dolphin (Northern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (Southern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin	N	N/A

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

	(offshore)		
	Long-finned pilot whale	N	N/A
	Short-finned pilot whale	N	N/A
	White-sided dolphin	N	N/A
	Harbor porpoise	Y	198
	Short-beaked common dolphin	Y	12
	Risso's dolphin	Y	6.8
	Harbor seal	Y	49
	Harp seal	Y	63
	Gray seal	Y	57
Pelagic Longline	Long-finned pilot whale (1)	N	N/A
	Risso's dolphin	Y	10
	Short-finned pilot whale (1)	Y	119
	Short-beaked common dolphin	Y	1.7
	Bottlenose dolphin (offshore)	Y	1.7
Northeast/Mid-Atlantic American Lobster Trap/Pot	Harbor seal	N	N/A
Category II			
Mid-Atlantic Mid-Water Trawl-Including Pair Trawl	Bottlenose dolphin (offshore)	N	N/A
	Risso's dolphin	Y	0.2
	White-sided dolphin (1)	Y	6
	Short-beaked common dolphin	Y	0.6
	Long and short-finned pilot whales	Y	2.4
	Gray seal	Y	0.2
	Harbor seal	Y	0.2
Northeast Mid-Water Trawl-Including Pair Trawl	White-sided dolphin	N	N/A
	Short-beaked common dolphin	N	N/A
	Long and short-finned pilot whales (1)	Y	4
	Harbor seal	Y	0.7
Northeast Bottom Trawl	Harp seal	Y	0.4
	Harbor seal	Y	0.8
	Gray seal	Y	9.2

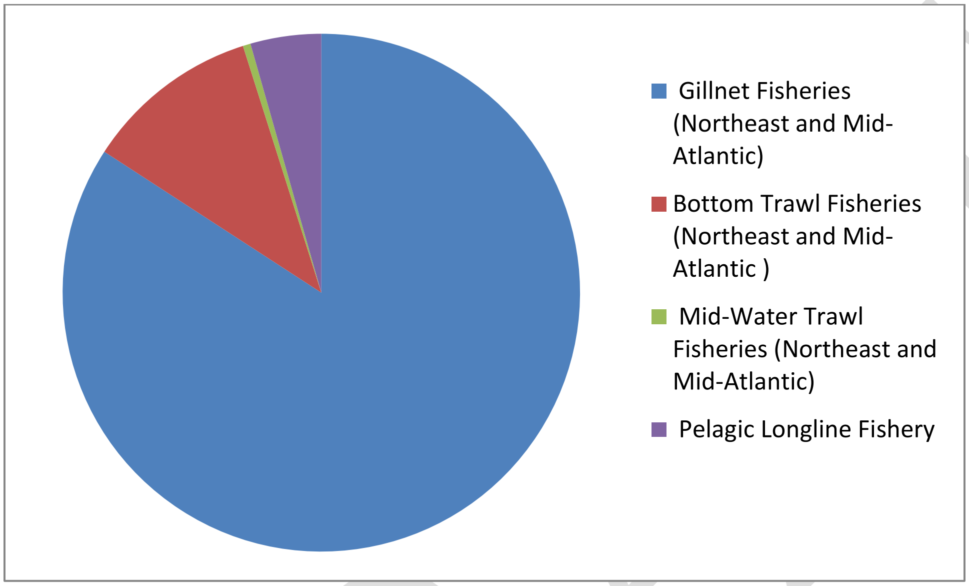
	Long and short-finned pilot whales	Y	10
	Short-beaked common dolphin	Y	19
	White-sided dolphin (1)	Y	73
	Harbor porpoise	Y	4.5
	Bottlenose dolphin (offshore)	Y	20
	Risso's dolphin	Y	2.5
Mid-Atlantic Bottom Trawl	White-sided dolphin	Y	4
	Long and short-finned pilot whales (1)	Y	26
	Short-beaked common dolphin (1)	Y	96
	Risso's dolphin (1)	Y	42
	Bottlenose dolphin (offshore)	Y	20
	Harbor seal	Y	0.2
Northeast Anchored Float Gillnet	Harbor seal	N	N/A
	White-sided dolphin	N	N/A
Atlantic Blue Crab Trap/Pot	Bottlenose dolphin (Northern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (Southern Migratory coastal) (1)	N	N/A
Mid-Atlantic Haul/Beach Seine	Bottlenose dolphin (Northern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (Southern Migratory coastal) (1)	N	N/A

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

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

Based on the information provided in Table 33, it is apparent that there are multiple Category I and II fisheries in the affected environment of the multispecies fishery that result in the serious injury and morality of small cetaceans and pinnipeds. Of these fisheries; however, the Northeast and Mid-Atlantic gillnet fisheries, followed by the bottom trawl fisheries (Category I and II fisheries, respectively) pose the greatest risks of serious injury and mortality to small cetaceans and pinnipeds (Figure 14). Based on the available observer data from 2007-2011 (see Table 33), approximately 84% of the total mean annual mortality to marine mammals (small cetaceans + seals, large whales excluded) is attributed to gillnet fisheries, followed by bottom trawl (10.94%), pelagic longline (4.42%) and mid-water trawl (0.48%) fisheries.

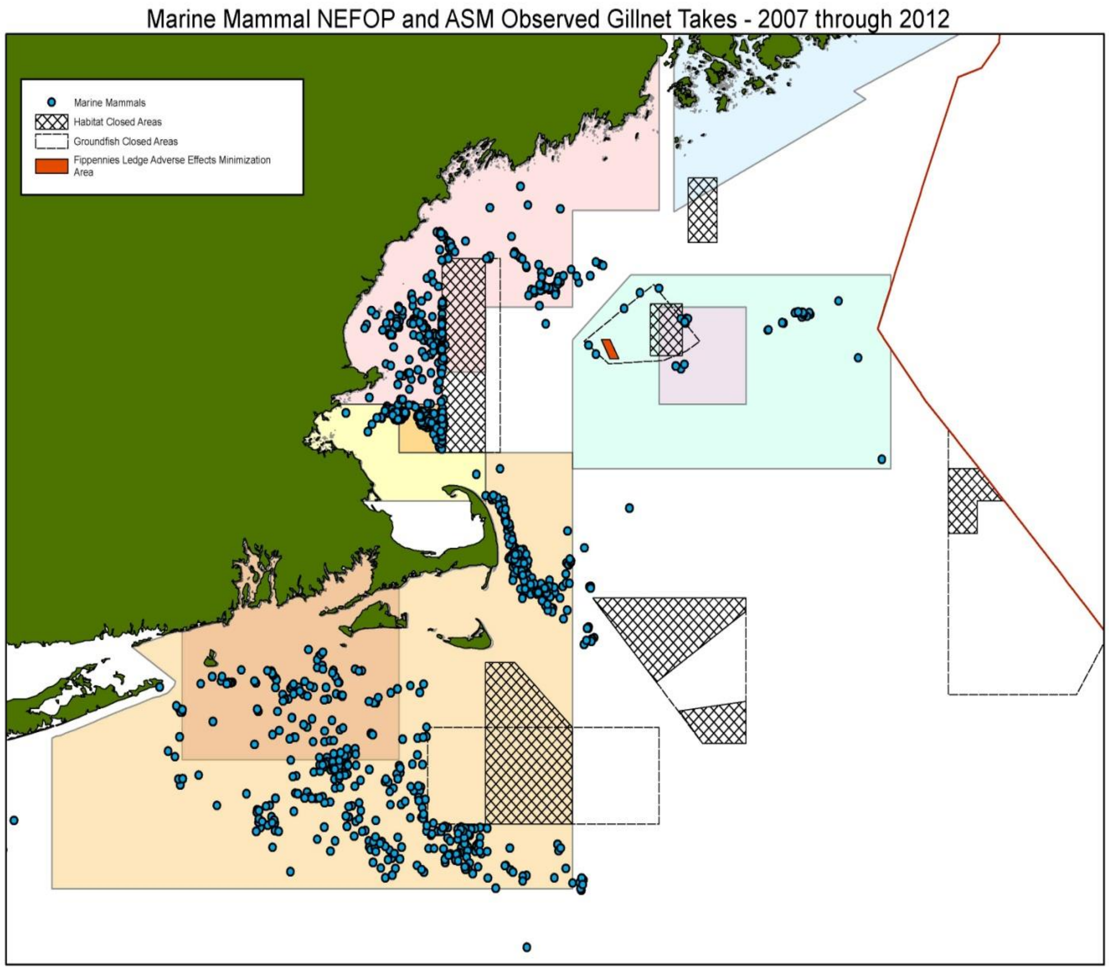
Figure 14 - 2007-2011 total mean annual mortality of small cetaceans and pinnipeds by Category I and II Fisheries



Although there are multiple Category I and II fisheries that result in the serious injury and morality of small cetaceans and pinnipeds, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For instance, the following figures (Figure 15 and Figure 16) depict observed marine mammal takes (large whales excluded) in gillnet and trawl gear in the GOM, GB, and SNE sub-regions of the multispecies fisheries from 2007-2011.[13] As depicted in Figures 7 and 8, over the last 5 years, there appears to be particular areas of the GOM, GB, and SNE sub-regions where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence. Although uncertainties, such as shifting fishing effort patterns and data on true density (or even presence/absence) for some species, remain, the available observer data, as depicted in Figures 47 and 8, does provide some insight into areas in the ocean where the likelihood of interacting with a particular species is high and therefore, provides a means to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds.

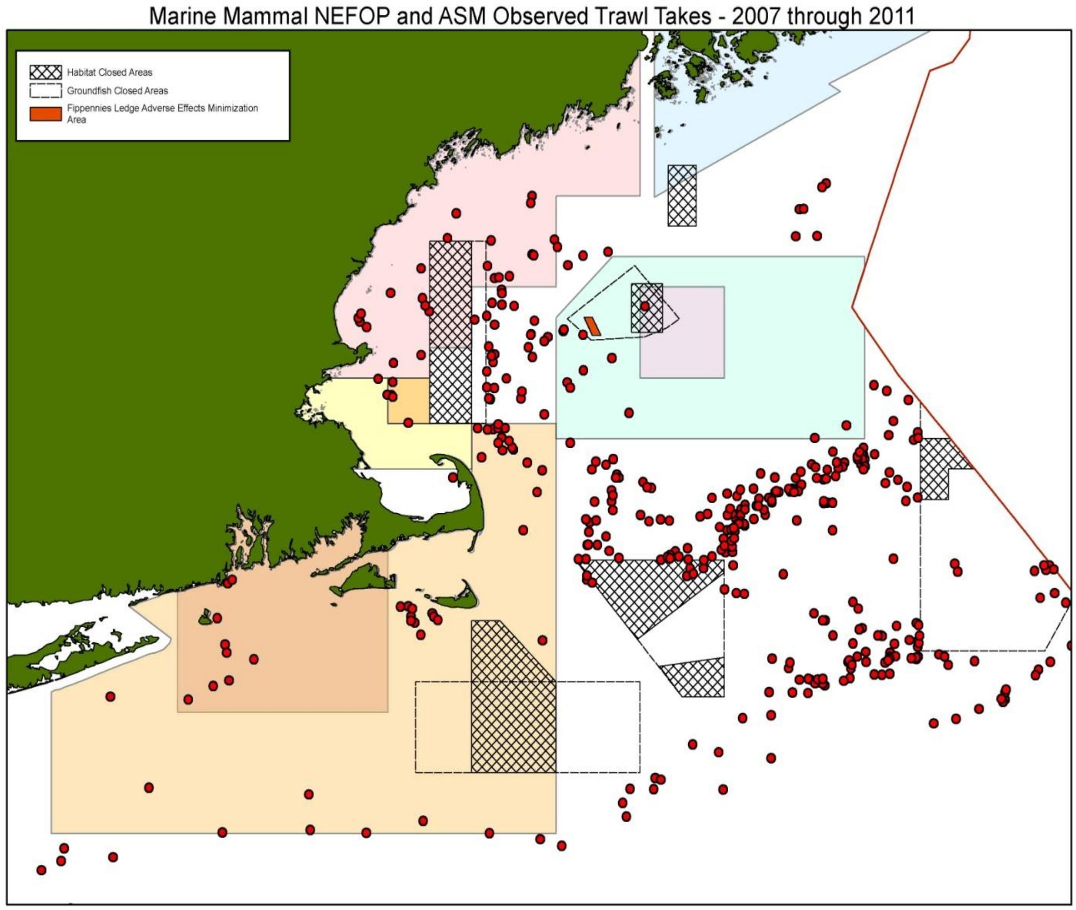
[13] Additional maps of marine mammal takes in various fishing gear can be found in Waring *et al*. 2014.

Figure 15 - Map of marine mammal bycatch in gillnet gear in the New England region (excluding large whales) observed by traditional fishery observers and at sea monitors between 2007 and 2011



Notes: Small cetacean and pinnipeds have been observed taken primarily in: (1) the waters west of the GOM Habitat/Groundfish closed area: Harbor seals, harp seals, and harbor porpoise; (2) off of Cape Cod, MA: Gray seals, harbor seals, and harbor porpoise; (3) west of the NLCA (Groundfish closed area): Harbor porpoise, short- beaked common dolphin, gray seals, harp seals, and harbor seals; and (4) waters off southern Massachusetts and Rhode Island: Gray seals and harbor seals, and some harbor porpoise and short-beaked common dolphin.

Figure 16 - Map of marine mammal bycatch in trawl gear in the New England region (excluding large whales) observed by traditional fishery observers and at sea monitors between 2007 and 2011



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

As noted above, numerous species of small cetaceans and pinnipeds interact with Category I and II fisheries in the Atlantic Ocean; however, several species in Table 33 have experienced such great losses to their populations as a result of interactions with Category I and II fisheries that they are now considered strategic stocks under the MMPA.[14] These species are the harbor porpoise, the Western North Atlantic Northern Migratory Coastal Stock of bottlenose dolphin and the Western North Atlantic Southern Migratory Coastal Stock of bottlenose dolphin. Section 118(f)(1) of the MMPA requires the preparation and implementation of a TRP for any strategic marine mammal stock that interacts with Category I or II

[14] Harbor porpoise are considered a strategic stock under the MMPA as the level of direct human-caused mortality has exceeded the PBR level for this species. Both northern and southern migratory coastal stocks of bottlenose dolphins are considered a strategic stock under the MMPA as both stocks are designated as depleted under the Act.

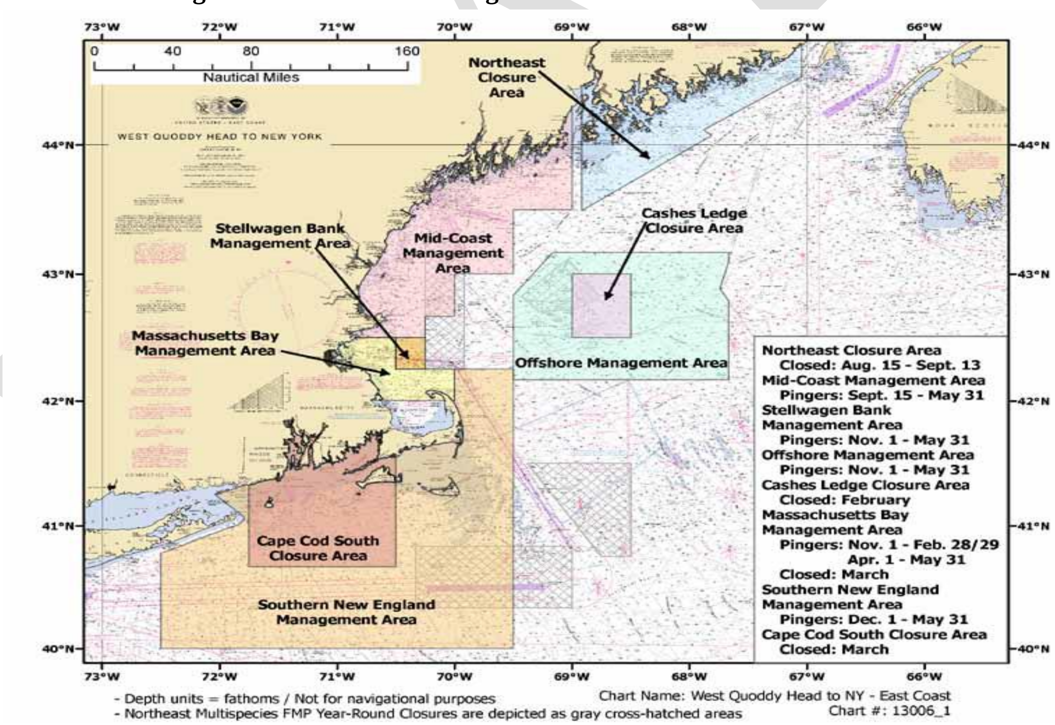
fisheries. As a result, the Harbor Porpoise TRP (HPTRP or Plan) and the Bottlenose Dolphin TRP (BDTRP or Plan) were developed and implemented for these species. The following provides a brief overview and summary for each TRP; however, additional information on each TRP can be found at: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/ or http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm

Harbor Porpoise Take Reduction Plan (HPTRP)

To address the high levels of incidental take of harbor porpoise in the groundfish sink gillnet fishery, a Take Reduction Team was formed in 1996. A rule (63 FR 66464) to implement the Harbor Porpoise Take Reduction Plan, and therefore, to reduce harbor porpoise bycatch in U.S. Atlantic gillnets was published on December 2, 1998, and became effective on January 1, 1999; the Plan was amended on February 19, 2010 (75 FR 7383), and October 4, 2013 (78 FR 61821). Since gillnet operations differ between the New England and Mid-Atlantic regions, the follow sets of measures were devised for each region:

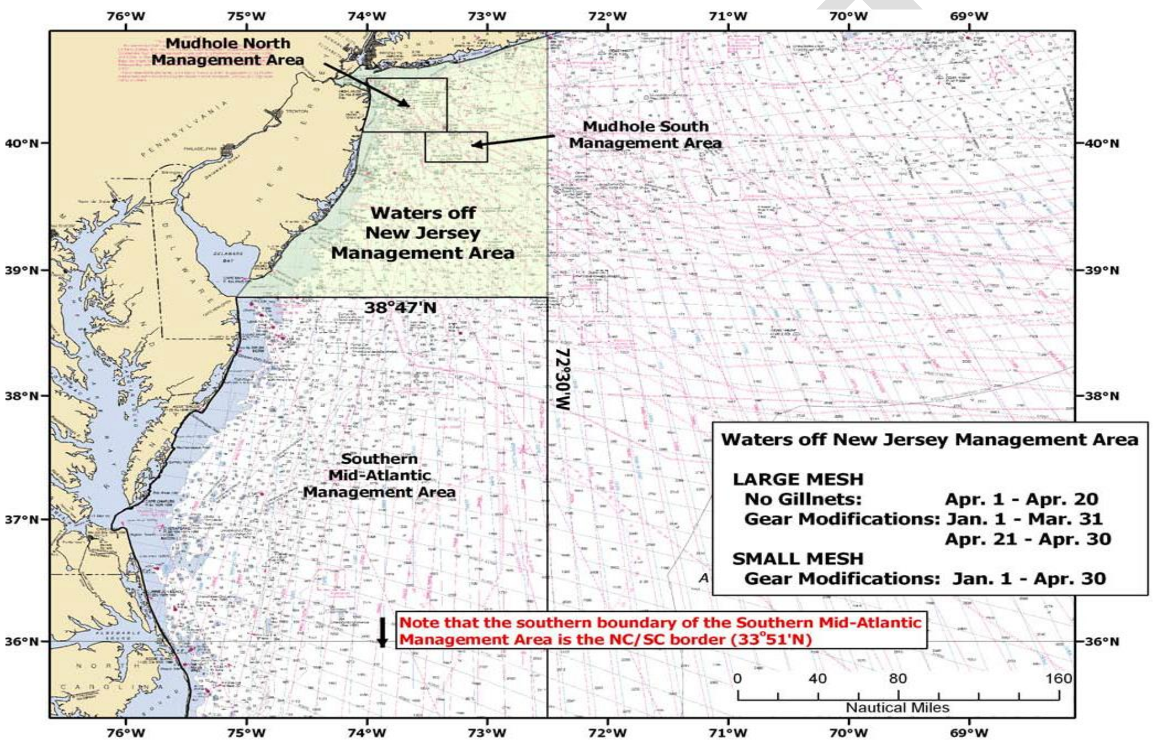
- **New England Region**: The New England component of the HPTRP pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. This portion of the Plan includes time and area closures, as well as closures to multispecies gillnet fishing unless pingers are used in the manner prescribed in the TRP regulations (Figure 17). For additional details see 50 CFR 229.33 and the outreach guide at http://www.greateratlantic.fisheries.noaa.gov/prot_res/porptrp/doc/HPTRPNewEnglandGuide.pdf

Figure 17. HPTRP Management Areas for New England



- **Mid-Atlantic Region:** The Mid-Atlantic portion of the HPTRP pertains to the Mid-Atlantic shoreline from the southern shoreline of Long Island, New York to the North Carolina/South Carolina border. It includes four management areas (Waters off New Jersey, Mudhole North (located in Waters off New Jersey Management Area), Mudhole South (located in Waters off New Jersey Management Area), and Southern Mid-Atlantic), each with time and area closures to gillnet fishing unless the gear meets certain specifications. Additionally, during regulated periods, gillnet fishing in each management area of the Mid-Atlantic is regulated differently for small mesh (> 5 inches to < 7 inches) and large (7-18 inches) mesh gear. The Plan also includes some time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Figure 18 and Figure 19 provide a depiction of the Mid-Atlantic Management Areas. For additional details see 50 CFR 229.34 and the outreach guide at http://www.greateratlantic.fisheries.noaa.gov/prot_res/porptrp/doc/HPTRPMidAtlanticGuide_Feb%202010.pdf

Figure 18. HPTRP-Waters off New Jersey Management Area



Notes:

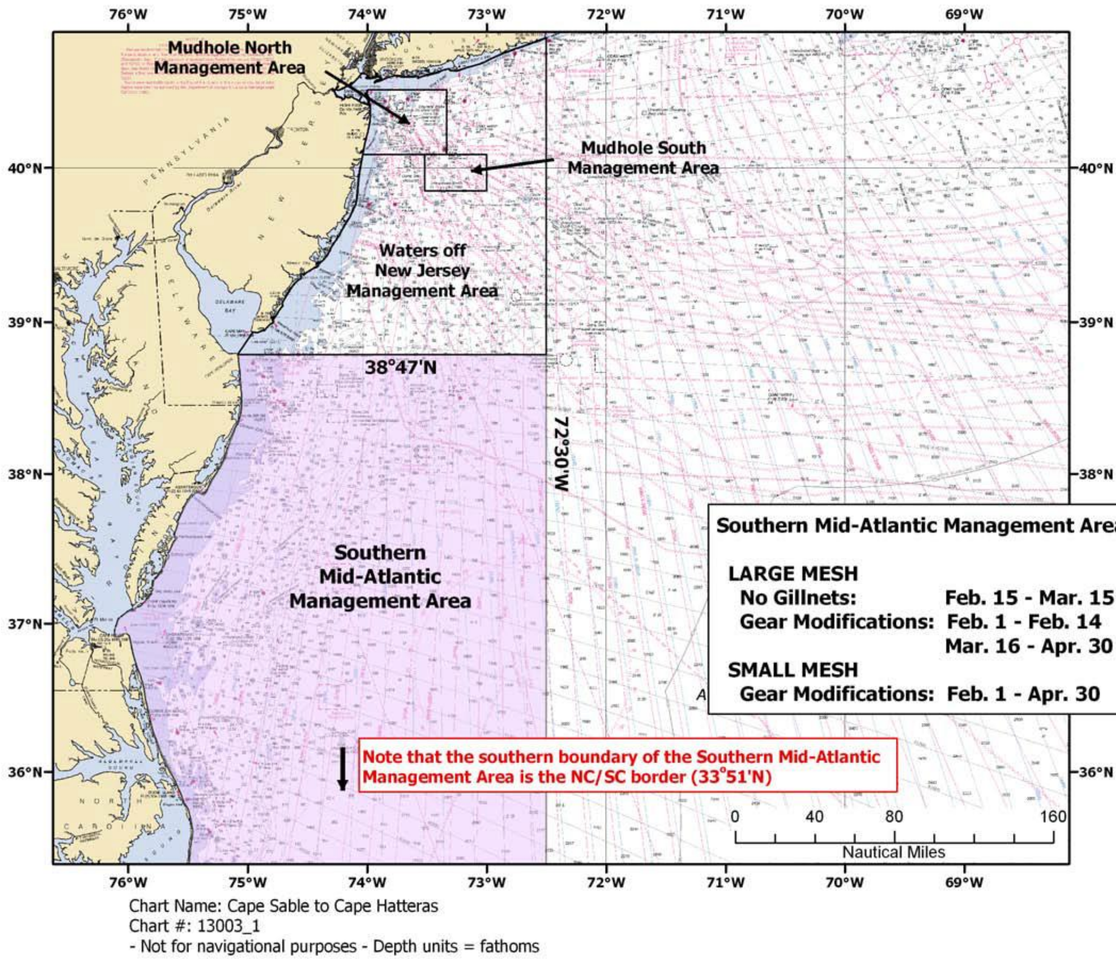
Mudhole North Management Area Small Mesh
Gear Modification: Jan. 1- Apr. 30
No Gillnet: Feb. 15-Mar. 15

Mudhole North Management Area Large Mesh
Gear Modification: Jan. 1- Apr. 30
No Gillnet: Feb. 15-Mar. 15; Apr. 1-Apr. 20

Mudhole South Management Area Small Mesh
Gear Modification: Jan. 1- Jan.31; Mar. 16-Apr.30
No Gillnet: Feb. 1-Mar.15

Mudhole South Management Area Large Mesh
Gear Modification: Jan. 1- Jan.31; Mar. 16-Mar. 31; Apr. 21- Apr. 30
No Gillnet: Feb. 1-Mar.15; Apr. 1- Apr. 20

Figure 19. . HPTRP-Southern Mid-Atlantic Management Area



Bottlenose Take Reduction Plan

In April 2006, NMFS published a final rule to implement the TRP for the WNA coastal stock of bottlenose dolphin (April 26, 2006, 71 FR 24776) to reduce the incidental mortality and serious injury in the Mid-Atlantic gillnet fishery and eight other coastal fisheries operating within the dolphin's distributional range. The other Atlantic coastal fisheries include the North Carolina inshore gillnet fishery, Southeast Atlantic gillnet fishery, Atlantic blue crab trap/pot fishery, Mid-Atlantic haul/beach seine fishery, North Carolina long haul seine fishery, North Carolina roe mullet stop net fishery, Southeastern U.S. Atlantic shark gillnet fishery, and the Virginia pound net fishery (NMFS 2002). The final rule also revised the large mesh size restriction under the Mid-Atlantic large mesh gillnet rule for conservation of endangered and threatened sea turtles to provide consistency among Federal and state management measures. The BDTRP was amended on July 31, 2012 (77 FR 45268) to permanently continue nighttime fishing restrictions of medium mesh gillnets operating in North Carolina coastal state waters. The measures contained in the Plan include gillnet effort reduction, gear proximity requirements, gear or gear deployment modifications, and outreach and educational measures to reduce dolphin bycatch below the marine mammals stock's PBR. For additional details on the BDTRP please visit: **http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm.**

6.4.4.1.3 Sea Turtles

As described in section 6.4.3.1, sea turtles are widely distributed in the waters of the Northwest Atlantic. As a result, sea turtles often occupy many of the same ocean areas utilized for commercial fishing and therefore, interactions with fishing gear are possible. Sea turtles have been incidentally injured or killed in various gear types (e.g., gillnets, trawls, hook and line gear, dredge); however, of the gear types that could be possibly used in the multispecies fishery, trawl and gillnet pose the greatest risk to sea turtles and therefore, will be the focus of the following discussion. In addition, although sea turtle interactions with trawl and gillnet gear have been observed in waters from the GOM to the Mid-Atlantic, most of the observed interactions have occurred in the Mid-Atlantic. As few sea turtle interactions have been observed in the GOM and GB regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl or gillnet gear in these regions and therefore, produce a bycatch estimate for these regions. As a result, the following bycatch estimates are based on observed sea turtle interactions in trawl and gillnet gear in the Mid-Atlantic.

In a study done by Warden (2011a), it was estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., i.e., south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border) was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but being released through a Turtle Excluder Device.[15] Of the 292 average annual observable loggerhead interactions, approximately 44 of those were adult equivalents (Warden 2011a).[16] This estimate is a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated to be 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a). Warden (2011b), using species landed, also estimated total loggerhead interactions attributable to managed species. Five loggerhead interactions (estimated observable and unobservable but quantifiable) were attributed to Northeast multispecies. In addition, green, Kemp's ridley, and leatherback sea turtles have been documented in bottom trawl gear in areas that overlap with the Northeast groundfish fishery (NEFSC FSB database). One of these, a leatherback sea turtle, was captured on trip where the top landed species was whiting, while another sea turtle (unknown species) was captured on trip where the top landed species was pollock.

Murray (2013) conducted an assessment of loggerhead and unidentified hard-shell turtle interactions in Mid-Atlantic gillnet gear from 2007-2011. Based on Northeast Fisheries Observer Program data from 2007-2011, interactions between loggerhead and hard-shelled turtles (loggerheads plus unidentified hard-shelled) and commercial gillnet gear in the Mid-Atlantic averaged 95 hard-shelled turtles and 89 loggerheads (equivalent to 9 adults) annually (Murray 2013). However, average estimated interactions in large mesh gear in warm, southern Mid-Atlantic waters have declined relative to those from 1996-2006 (Murray 2009), as did the total commercial effort (Murray 2013). Murray (2013) also estimated interactions by managed species landed in gillnet gear from 2007-2011. An estimate was not provided for the Northeast multispecies fisheries; however, takes have been observed in sink gillnet fisheries targeting other species. One of these was documented by an at sea monitor north of 42° N latitude. Leatherback,

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

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

Kemp’s ridley, and green sea turtles have also been documented in Mid-Atlantic gillnet gear by fishery observers (NEFSC FSB database), with observed takes of Kemp’s ridley and leatherback sea turtles having occurred in areas that overlap with the Northeast multispecies fishery.

Although sea turtles have the potential to interact with multiple gear types, such as trawl or gillnet gear, the risk of an interaction is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, environmental conditions, and sea turtle occurrence and distribution. Murray and Orphanides (2013) recently evaluated fishery-independent and dependent data to identify environmental conditions associated with turtle presence and the subsequent risk of a bycatch encounter if fishing effort is present; It was concluded that fishery independent encounter rates were a function of latitude, sea surface temperature (SST), depth, and salinity. When the model was fit to fishery dependent data (gillnet, bottom trawl, and scallop dredge), Murray and Orphanides (2013) found a decreasing trend in encounter rates as latitude increases; an increasing trend as SST increases; a bimodal relationship between encounter rates and salinity; and higher encounter rates in depths between 25 and 50 m. Similarly, Murray (2013) concluded, based on 2007-2011 data obtained on loggerhead interactions in gillnet gear, that bycatch rates were associated with latitude, SST, and mesh size, with highest interaction rates in the southern mid-Atlantic in warm surface waters and in large (>7 inch mesh). Based on the above 2005-2008 data obtained on loggerhead interactions in bottom trawl gear, Warden (2011a) also found that latitude, depth and SST were associated with the interaction rate, with the rates being highest south of 37° N in waters < 50 meters deep and SST > 15°C (Table 34).

Table 34 - Mid-Atlantic trawl bycatch rates (Warden 2011a).

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

6.4.4.1.4 Atlantic Sturgeon

As described in Section 6.4.3, the marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range, although genetic analyses suggests that the distribution of each varies within that range (King *et al*. 2001; Laney *et al*. 2007; Dunton *et al*. 2012; Wirgin *et al*. 2012; Waldman *et al*. 2013; O’Leary *et al*. 2014). Three separate publications using different information sources reached the same conclusion; Atlantic sturgeon occur primarily in waters less than 50 meters (although deeper waters are also used), aggregate in certain areas, and exhibit seasonal movement patterns (see Stein *et al*. 2004b;

Dunton *et al*. 2010; Erickson *et al*. 2011; see Section 6.4.3 for additional details). These characteristics of Atlantic sturgeon occurrence and distribution result in Atlantic sturgeon occupying many of the same ocean areas utilized for commercial fishing and therefore, occupying areas in which interactions with fishing gear are possible.

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

- Setting gillnet gear at depths <40 meters;
- Using gillnet gear with mesh sizes >10 inches;
- Setting gillnet gear during spring, fall, and winter months;
- Long soak times (i.e., >24 hours); and
- Setting gear during warmer water temperatures

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

6.4.4.1.5 Atlantic Salmon

As described in section 1.1.3, the marine range of the GOM Distinct Population Segment extends from the GOM (primarily northern portion), to the coast of Greenland (NMFS and USFWS 2005; Fay *et al*. 2006). Although the distribution of Atlantic salmon in the marine environment likely overlaps with commercial fisheries, there have been a low number of observed interactions with fisheries and various gear types. According to the Biological Opinion issued by NMFS Greater Atlantic Regional Fisheries Office on December 16, 2013, NMFS Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer and At-Sea Monitoring Programs documented a total of15 individual salmon incidentally caught on over 60,000 observed commercial fishing trips from 1989 through August 2013 (NMFS 2013;Kocik *et al*. 2014). Specifically, Atlantic salmon were observed bycaught in gillnet (11/15) and bottom otter trawl gear (4/15), with 10 of the incidentally caught salmon listed as "discarded" and five reported as mortalities (Kocik (NEFSC), pers. comm (February 11, 2013) in NMFS 2013). The genetic identity of these captured salmon is unknown; however, the NMFS 2013 Biological Opinion considers all 15 fish to be part of the GOM Distinct Population Segment, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts).

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

6.5 Human Communities/Social-Economic Environment

This EA considers and evaluates the effect management alternatives may have on people's way of life, traditions, and community. These economic and social impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. While it is possible that these impacts could be solely experienced by individual fishermen, it is more likely that impacts would be experienced across communities, gear types, and/or vessel size classes.

This section reviews the Northeast multispecies fishery and describes the human communities potentially impacted by the Proposed Action. This includes a description of the sector and common pool participants' groundfish fishing and their homeports. Table 35 contains a summary of major trends in the groundfish fishery. Additional information may be found in the FY2010, FY2011, and FY2012 performance reports for this fishery by the NEFSC (Kitts et al. 2011; Murphy et al. 2014; Murphy et al. 2012).

Table 35 - Summary of major trends in the Northeast multispecies fishery

	FY2009	FY2010			FY2011			FY2012		
	Total	**Total**	**Sector Vessels**	**Common Pool**	**Total**	**Sector Vessels**	**Common Pool**	**Total**	**Sector Vessels**	**Common Pool**
Groundfish Gross Nominal Revenue	$82,510,132	$83,177,330	$81,123,145	$2,054,184	$90,453,455	$89,603,929	$849,526	$69,778,174	$69,135,759	$642,414
Non-groundfish Gross Nominal Revenue	$180,396,477	$210,631,484	$115,682,739	$94,948,745	$240,364,488	$144,718,459	$95,646,029	$235,730,686	$140,108,099	$95,622,587
Total Gross Nominal Revenue	$262,906,608	$293,808,814	$196,805,885	$97,002,930	$330,817,943	$234,322,388	$96,495,555	$305,508,860	$209,243,859	$96,265,001
Groundfish average price	$1.21/lb	$1.43/lb	$1.43/lb	$1.58/lb	$1.47/lb	$1.47/lb	$1.64/lb	$1.51/lb	$1.51/lb	$1.79/lb
Non-groundfish average price	$0.97/lb	$1.21/lb	$1.19/lb	$1.24/lb	$1.14/lb	$1.13/lb	$1.16/lb	$1.11/lb	$1.07/lb	$1.17/lb
Number of active vessels	916	854	435	419	776	442	337	764	446	320
Number of active vessels that took a groundfish trip	566	445	303	142	419	302	117	401	304	97
Number of groundfish trips	25,897	13,474	11,190	2,284	15,958	13,679	2,279	14,496	12,943	1,553
Number of non-groundfish trips	37,173	38,489	16,527	21,962	33,675	16,795	16,880	32,523	17,090	15,433
Number of days absent on groundfish trips	24,605	18,401	16,796	1,605	21,465	19,963	1,502	19,935	18,964	971
Number of days absent on non-groundfish trip	31,606	31,352	16,022	15,330	27,997	15,484	12,513	28,632	16,189	12,442
Total Crew Positions	2,416	2,255			2,161			2,136		
Total Crew-trips	148,153	123,885			122,003			116,334		
Total Crew-days	187,219	169,939			169,417			167,620		

Notes: Data includes all vessels with a valid limited access multispecies permit. Sector plus common pool vessel counts may exceed the total vessel count because vessels may switch between sector and common pool eligibilities during the fishing year. "Trips" refer to commercial trips in the northeast Exclusive Economic Zone (EEZ). Past reports included party/charter trips. From Murphy et al. (2014).

6.5.1 The New England Groundfish Fishery

New England's fishery has been identified with groundfish fishing both economically and culturally for over 400 years. Broadly described, the Northeast multispecies fishery includes the landing, processing, and distribution of commercially important fish that live on the sea bottom. In the early years, the Northeast multispecies fishery caught primarily cod and haddock. Today, the Northeast Multispecies FMP (large-mesh and small-mesh) includes 13 species of groundfish (Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, windowpane flounder, American plaice, Atlantic halibut, redfish, ocean pout, white hake, and wolffish) harvested from three geographic areas (Gulf of Maine, Georges Bank, and southern New England/Mid-Atlantic Bight), representing 19 distinct stocks.

Prior to the Industrial Revolution, the groundfish fishery focused primarily on cod. The salt cod industry, which preserved fish by salting while still at sea, supported a hook and line fishery that included hundreds of sailing vessels and shoreside industries including salt mining, ice harvesting, and boat building. Late in the 19^{th} century, the fleet also began to focus on Atlantic halibut, with landings peaking in 1896 at around 4,900 tons (4,445 mt) (NOAA 2007).

From 1900 to 1930, the fleet transitioned to steam powered trawlers and increasingly targeted haddock for delivery to the fresh and frozen fillet markets. With the transition to steam powered trawling, it became possible to exploit the groundfish stocks with increasing efficiency. This increased exploitation resulted in a series of boom and bust fisheries from 1930 to 1960 as the North American fleet targeted previously unexploited stocks, depleted the resource, and then transitioned to new stocks (NOAA 2007).

In the early 1960's, fishing pressure increased with the discovery of haddock, hake, and herring off of Georges Bank and the introduction of foreign factory trawlers. Early in this time period, landings of the principal groundfish (cod, haddock, pollock, hake, and redfish) peaked at about 650,000 tons (589,670 mt). However, by the 1970's, landings decreased sharply to between 200,000 and 300,000 tons (181,437 and 272,155 mt) as the previously virgin GB stocks were exploited (NOAA 2007).

The exclusion of the foreign fishermen by the Fisheries Conservation and Management Act in 1976, coupled with technological advances, government loan programs, and some strong classes of cod and haddock, caused a rapid increase in the number and efficiency of U.S. vessels participating in the Northeast groundfish fishery in the late 1970's. This shift resulted in a temporary increase in domestic groundfish landings; however, overall landings (domestic plus foreign) continued to trend downward from about 200,000 tons (181,437 mt) to about 100,000 tons (90,718 mt) through the mid 1980's (NOAA 2007).

In 1986, the NEFMC implemented the Northeast Multispecies FMP with the goal of rebuilding stocks. Since Amendment 5 in 1994, the multispecies fishery has been administered as a limited access fishery managed through a variety of effort control measures including DAS, area closures, trip limits, minimum size limits, and gear restrictions. Partially in response to those regulations, landings decreased throughout the latter part of the 1980's until reaching a more or less constant level of around 40,000 tons (36,287 mt) annually since the mid 1990's.

In 2004, the final rule implementing Amendment 13 to the Northeast Multispecies FMP allowed for self-selecting groups of limited access groundfish permit holders to form sectors. These sectors developed a legally binding operations plan and operated under an allocation of GB cod. While approved sectors were subject to general requirements specified in Amendment 13, sector members were exempt from DAS and some of the other effort control measures that tended to limit the flexibility of fishermen. The rule authorized implementation of the first sector, the GB Cod Hook Sector. A second sector, the GB Cod Fixed Gear Sector, was authorized in 2006.

Through Amendment 16, the NEFMC sought to rewrite groundfish sector policies with a scheduled implementation date of May 1, 2009. When that implementation date was delayed until FY2010, the NMFS Regional Administrator announced that, in addition to a previously stated 18% reduction in DAS, interim rules would be implemented to reduce fishing mortality during FY2009. These interim measures generally reduced opportunity among groundfish vessels through:

- Differential DAS counting;
- Elimination of the SNE/MA winter flounder SAP;
- Elimination of the state waters winter flounder exemption;
- Revisions to incidental catch allocations; and
- Reduction in some groundfish allocations (NOAA 2009).

In 2007, the Northeast multispecies fishery included 2,515 permits. Of these, about 1,400 were limited access. There were about 660 vessels that actively fished. Those vessels include a range of gear types: hook, bottom longline, gillnet, and trawl (NEFMC 2009a). In FY2009, between 40 and 50 of these vessels were members of the GB Cod Sectors. The passage of Amendment 16, implemented in FY2010, ushered in a new era of sector management in the New England groundfish fishery. Since FY2010, over 50% of eligible northeast groundfish multispecies permits and over 90% of landings history has been associated. The remaining vessels were common pool groundfish fishing vessels.

Amendment 16 to the Northeast Multispecies FMP was implemented for the New England groundfish fishery starting on May 1, 2010, the start of the 2010 fishing year. There were two substantial changes meant to adhere to the catch limit requirements and stock rebuilding deadlines of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSA). The first change developed "hard quota" annual catch limits (ACLs) for all 20 stocks in the groundfish complex. The second change expanded the use of Sectors, which are allocated subdivisions of ACLs called Annual Catch Entitlements (ACE) based on each sector's collective catch history.[17] Sectors received ACE for nine of 13 groundfish species (14 stocks + quotas for Eastern US/Canada cod and haddock; 16 ACEs) in the FMP and became exempt from many of the effort controls previously used to manage the fishery.

During the first year of sector management, 17 sectors operated, each establishing its own rules for using its allocations. Vessels with limited access permits that joined sectors were allocated 98% of the total commercial groundfish sub-ACL, based on their collective level of historical activity in the groundfish fishery. Approximately half (46%) of the limited access groundfish permits opted to remain in the common pool. Common pool vessels act independently of one another, with each vessel constrained by the number of DAS it can fish, by trip limits, and by all of the time and area closures. These restrictions help ensure that the groundfish catch of common pool vessels does not exceed the common pool's portion of the commercial groundfish sub- ACL for all stocks (about 2% for 2010) before the end of the fishing year.

In the second year of sector management, 58% of limited access permits enrolled in one of 16 sectors or one of two lease-only sectors. From 2010 to 2011, the number of groundfish limited access eligibilities belonging to a sector increased by 66, while the number of these permits in the common pool decreased by 85. At the start of FY2011, vessels operating within a sector were allocated about 98% of the total

[17] To determine the ACE, the sum of all of the sector members' potential sector contributions (PSCs) (a percentage of the ACL) are multiplied by the ACL.

groundfish sub-ACL, based on historical catch levels. Those vessels that opted to remain in the common pool were given access to about 2% of the groundfish sub-ACL based on the historic catch. The same effort controls employed in 2010 were again used in 2011, to ensure the groundfish catch made by common pool vessels did not exceed the common pool's portion of the commercial groundfish sub-ACL.

In FY12, 60% of limited access permits enrolled in sectors. From FY2011 to FY2012, the number of groundfish limited access eligibilities belonging to a sector increased by 22, while the number of these permits in the common pool decreased by 36. Although some trends in the fishery are a result of management changes made to the fishery in the years prior to Amendment 16, many of these trends reflect the current system of catch share management.

6.5.2 Fleet Characteristics

The overall trend since the start of sector management has been a decline in the number of vessels with a limited access groundfish permit, at a low of 1,177 in FY2012 (Table 36). Of those vessels, those with revenue from at least one groundfish trip have also declined, with 401 in FY2012. The proportion of vessels affiliated with a sector has increased each year since FY2010. A key aspect of Amendment 16 is the ability of a sector to jointly decide how its ACE will be harvested, through redistribution within a sector and/or transferring ACE between sectors. Because inactive sector vessels may benefit if other sector vessels harvest their allocation, changes in the number of inactive vessels may result from a transfer of allocation and not necessarily vessels exiting the fishery. Since FY2010, 35-37% of the vessels were inactive (no landings). Of these inactive vessels, 64-69% were affiliated with sectors.

Table 36 - Number of vessels by fishing year

	FY2009	FY2010	FY2011	FY2012
	As of May 1 each Fishing Year:			
Total groundfish limited access eligibilities	1,464	1,441	1,422	1,408
Eligibilities held as Confirmation of Permit History	81	94	168	228
	During any part of the fishing year*:			
Total eligible vessels	1,459	1,409	1,321	1,223
Eligible vessels that did not renew a limited access groundfish permit	28	26	42	46
Vessels with a limited access groundfish permit	1,431	1,383	1,279	1,177
	While under a limited access groundfish permit:			
... those with revenue from any species**	916	854	776	764
... those with revenue from at least one groundfish trip	566	445	419	401
... those with no landings	515	529	503	413
Percent of inactive (no landings) vessels	(36%)	(38%)	(39%)	(35%)

Source: Murphy et al (2014, Table 10).
* On May 1st of the fishing year the number of vessels will equal to the number of eligibilities not in Confirmation of Permit History (CPH). Over time the number of vessels will differ from the number of eligibilities because these eligibilities can be transferred from vessel to vessel during the fishing year. These numbers exclude groundfish limited access eligibilities held as CPH. Starting in 2010, Amendment 16 authorized CPH owners to join Sectors and to lease DAS. For purposes of comparison, CPH vessels are not included in the data for either Sector or Common Pool.
**Active vessels in this report received revenue from any species while fishing under a limited access groundfish permit.

6.5.3 Effort

The groundfish fishery has traditionally been made up of a diverse fleet, comprised of a range of vessels sizes and gear types. Over the years, as vessels entered and exited the fishery, the typical characteristics defining the fleet changed as well. The number of active vessels has declined each year since at least FY2009. This decline has occurred across all vessel size categories (Table 37). Since FY2009, the 30' to < 50' vessel size category, which has the largest number of active groundfish vessels, experienced a 32% decline (305 to 206 active vessels). The <30' vessel size category, containing the least number of active groundfish vessels, experienced the largest (53%) reduction since FY2009 (34 to 16 vessels). The vessels in the largest (≥75') vessel size category experienced the least reduction (9%) since FY2009.

Table 37 - Vessel activity by size class

	FY2009	FY2010	FY2011	FY2012
Vessels with landings from any species				
Less than 30	73	65	51	48
30 to < 50	478	455	398	396
50 to < 75	236	217	211	205
75 and above	129	117	116	115
Total	**916**	**854**	**776**	**764**
Vessels with at least one groundfish trip				
Less than 30	34	24	20	16
30 to < 50	305	240	216	206
50 to < 75	157	118	117	115
75 and above	70	63	66	64
Total	**566**	**445**	**419**	**401**

Source: Murphy et al. (2014, Tables 13 and 14).

Some of the proposed benefits of a catch share system of management are the potential efficiency gains associated with increasing operational flexibility (NOAA 2010). Being released from the former effort controls, but being held to ACLs, sector vessels were expected to increase their catch per unit effort by decreasing effort. Between 2009 and FY2010, the number of groundfish fishing trips[18] and total days

[18] "Groundfish trip" is defined as a trip where the vessel owner or operator declared, either through the vessel monitoring system or through the interactive voice response system, that the vessel was making a groundfish trip.

absent on groundfish trips declined by 48% and 27%, respectively (Table 38).[19] During the second year of sector management, 2011, the number of groundfish fishing trips and total days absent on groundfish trips increased. Effort on groundfish trips generally decreased in FY2012. Vessels took fewer groundfish trips, with fewer total days absent of groundfish trips, though average trip length increased slightly over FY2011.

The groundfish fleet overall took fewer non-groundfish trips in FY2012 than they did in FY2009-FY2011, but those trips are longer than they were in FY2010 and FY2011 (Table 38). The total number of non-groundfish trips taken by the fleet in FY2012 was 32,523 trips, a four year low and 3.4% lower than in FY2011. However, for the fleet overall, the total number of days absent on non-groundfish trips in FY2012 was higher than it was in 2011, with 635 (2.3%) more days absent. Furthermore, although the total number of days absent was 9.4% fewer than 2009, the average trip length in 2012 was the same as 2009 (0.92 days per trip) and higher than in 2010 and 2011 (0.86 days per trip).

Table 38 - Effort by active vessels

	FY2009	FY2010	FY2011	FY2012
Number of trips				
groundfish	25,897	13,474	15,958	14,496
non-groundfish	37,173	38,489	33,675	32,523
Number of days absent on trips				
groundfish	24,605	18,401	21,465	19,935
non-groundfish	31,606	31,352	27,997	28,632
Average trip length*				
groundfish	0.96	1.37	1.35	1.38
(std. dev.)	(1.74)	(2.14)	(2.20)	(2.19)
non-groundfish	0.92	0.86	0.86	0.92
(std. dev.)	(1.66)	(1.56)	(1.52)	(1.62)

Source: Murphy et al. (2014, Table 15).
***This is the average trip length of all individual trips that have non-missing values for days absent. Since some trip records have missing values for days absent, average trip length reported here may be higher than what is obtained by dividing the overall number of days absent by the overall number of trips.

6.5.4 Landings and Revenue

Total groundfish landings on trips made by vessels possessing a limited access groundfish permit in FY2012 were 46.3M pounds, which is the lowest landings since at least FY2009 (Table 39,Table 40). Because only 16 groundfish stocks are limited by sector allocations, it is important to consider the landings of non-groundfish species and groundfish species separately as a means of describing any possible shift in effort to other fisheries. Non-groundfish landings made by limited access vessels increased from 178.1M pounds in FY2010 to 213.8M pounds in FY2011, and remained fairly steady at 212.0M pounds in FY2012. Total landings of all species made by limited access vessels in the Northeast multispecies fishery was 258.3M pounds in FY2012. This compares to landings ranging from 236.4M –

[19] The data is taken from different source materials (VMS, etc.) than other data in this document, and thus, may be slightly different than.

272.9M pounds in the 2009–2011 fishing years. In FY2012, sector vessels accounted for 68% of all landings, 99% of groundfish landings, and 62% of non-groundfish landings.

Table 39 – Total landings and revenue from all trips by fishing year

	FY2009	FY2010	FY2011	FY2012
Landed Pounds				
Groundfish	68,416,222	58,178,065	61,661,450	46,295,753
Non-Groundfish	185,631,323	174,269,060	211,226,012	211,983,492
Total Pounds	254,047,546	232,447,125	272,887,462	258,279,245
Gross Revenue				
Groundfish	$82,510,132	$83,177,330	$90,453,455	$69,778,174
(in 2010 dollars*)	($83,386,467)	($83,177,330)	($88,658,472)	($67,252,170)
Non-Groundfish	$180,396,477	$210,631,484	$240,364,488	$235,730,686
(in 2010 dollars*)	($182,312,457)	($210,631,484)	($235,594,629)	($227,197,123)
Total Revenue	$262,906,608	$293,808,814	$330,817,943	$305,508,860
(in 2010 dollars*)	($265,698,924)	($293,808,814)	($324,253,101)	($294,449,293)

Source: Murphy et al. (2014, Table 2).
* Deflated by the calendar year 2010 Q2 GDP Implicit Price Deflator.

Table 40 - Total landings and nominal revenue from groundfish trips by fishing year

	FY2009	FY2010	FY2011	FY2012
Landed Pounds				
Groundfish	68,362,567	58,067,026	61,520,629	46,238,230
Non-Groundfish	30,965,367	23,147,600	28,781,804	27,527,755
Total Pounds	99,327,934	81,214,627	90,302,433	73,765,985
Gross Revenue				
Groundfish	$82,456,833	$82,964,771	$90,237,532	$69,669,582
Non-Groundfish	$25,862,188	$22,339,660	$31,826,744	$25,768,848
Total Revenue	$108,319,021	$105,304,431	$122,064,276	$95,438,430

Source: Murphy et al. (2014, Table 3).
* Deflated by the calendar year 2010 Q2 GDP Implicit Price Deflator.

During the first year of sector management, groundfish revenues from vessels with limited access groundfish permits in FY2010, were $83.2M (Table 19, Table 20). This was slightly lower than FY2009 revenues. In FY2011, the groundfish revenues from vessels with limited access groundfish permits were $90.4M. Groundfish revenue in FY2012 decreased to a four-year low of $69.8 million (22.9% lower than in 2011). Non-groundfish revenue decreased to $235.7 million (2% lower than in FY2011), but was still higher than in FY2009 and FY2010. In FY2012, sector vessels accounted for about 69% of all revenue earned by limited access permitted vessels. Sector vessels also earned 99% of revenue from groundfish landings and 59% of non-groundfish revenue.

6.5.5 ACE Leasing

Starting with allocations in FY2010, each sector was given an initial ACE determined by the pooled potential sector contribution (PSC) from each entity joining that sector. Every limited access groundfish permit also has a tracking identification number called a Moratorium Right Identifier (MRI). PSC is technically allocated to MRIs, which are subsequently linked to vessels through Northeast Multispecies limited access fishing permits. A vessel's PSC is a percentage share of the total allocation for each allocated groundfish stock based on that vessel's fishing history. Once a sector roster and associated PSC is set at the beginning of a fishing year, each sector is then able to distribute its ACE among its members. By regulation, ACE is pooled within sectors, however most sectors seem to follow the practice of assigning catch allowances to member vessels based on PSC allocations. This is an important assumption because vessels catching more than their allocation of PSC must have leased additional quota, either as PSC from within the sector or as ACE from another sector.

During FY2010, 282 sector-affiliated MRIs had catch that exceeded their individual PSC allocations for at least one stock. These vessels are then assumed to have leased in an additional 22M pounds of ACE and/or PSC with an approximate value of $13.5M. In FY2011, 256 sector-affiliated vessels had catch that exceeded their individual PSC allocations. These vessels are then assumed to have leased in 31M pounds of quota. Although the number of vessels leasing ACE fell by 9% the estimated number of pounds leased was almost 41% greater in FY2011 than in FY2010 (Murphy, et al. 2012). There were 241 sector-affiliated MRIs had catch that exceeded individual PSC allocations for at least one stock. These MRIs leased in >23M pounds of ACE and/or PSC in FY2012 (Murphy, et al. 2014)

6.5.6 Fishing Communities

There are over 400 communities that have been the homeport or landing port to one or more Northeast groundfish fishing vessels since 2008. These ports occur throughout the New England and Mid-Atlantic. Consideration of the economic and social impacts on these communities from proposed fishery regulations is required by the National Environmental Policy Act (NEPA 1970) and the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA 2007). Before any agency of the federal government may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) that includes the integrated use of the social sciences (NEPA Section 102(2)(C)). National Standard 8 of the MSA stipulates that "conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851(a)(8)).

A "fishing community" is defined in the Magnuson-Stevens Act, as amended in 1996, as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. § 1802(17)). Determining which fishing communities are "substantially dependent" on and "substantially engaged" in the groundfish fishery can be difficult.

Although it is useful to narrow the focus to individual communities in the analysis of fishing dependence, there are a number of potential issues with the confidential nature of the information. There are privacy concerns with presenting the data in such a way that proprietary information (landings, revenue, etc.) can be attributed to an individual vessel or a small group of vessels. This is particularly difficult when presenting information on ports that may only have a small number of active vessels.

6.5.6.1 Primary and Secondary Fishing Ports

In recent amendments to the FMP (e.g., NEFMC 2009), communities dependent on the groundfish resource have been categorized into primary and secondary port groups, so that community data can be cross-referenced with other demographic information .

- ***Primary ports*** are those communities that are substantially engaged in the groundfish fishery, and which are likely to be the most impacted by groundfish management measures. Primary ports were selected based on groundfish landings greater than 1,000,000 lbs annually since FY1994 and/or the presence of significant groundfish infrastructure (e.g., auctions and co-ops). They have demonstrated a continued substantial engagement in the groundfish fishery.
- ***Secondary ports*** are those communities that may not be substantially dependent or engaged in the groundfish fishery, but have demonstrated some participation in the groundfish fishery since FY1994. Because of the size and diversity of the groundfish fishery, it is not practical to examine each secondary port individually, which is why most secondary ports are grouped with others in the same county or in geographically adjacent counties.

Using the above definitions provides a way to consider the impacts of management measures on every port in which some amount of groundfish has been landed since 1994, and identifies place-based fishing communities based on level of engagement. Because significant geographical shifts in the distribution of groundfish fishing activity have occurred, the characterization of some ports as “primary” or “secondary” may not reflect their historical participation in and dependence on the groundfish fishery.

Descriptions of communities involved in the multispecies fishery, and further descriptions of Northeast fishing communities in general, can be found on Northeast Fisheries Science Center’s website. There are snapshots of the human communities and fisheries of the Northeast with the most recent data available for key indicators of dependence on fisheries and other economic and demographic characteristics at http://www.nefsc.noaa.gov/read/socialsci/communitySnapshots.php. Detailed profiles regarding the historic, demographic, cultural, and economic context for understanding a community's involvement in fishing are at http://www.nefsc.noaa.gov/read/socialsci/communityProfiles.html

To help describe which port communities could be most affected by the alternatives under consideration, Table 42 identifies the landings by homeport for FY2012, using the primary ports identified in Table 41. Gloucester, Boston, and New Bedford/Fairhaven, Massachusetts are homeports to vessels landing the most flounder stocks in FY2012. Information for all future stocks will be added in a later version.

Table 41 - Primary and secondary multispecies port communities

Region	Multispecies Port Community	
	Primary	Secondary
Downeast ME	-	Jonesport, West Jonesport, Beals Island, Milbridge, Machias, Eastport, Dyers Bay
Upper Mid-Coast ME 1	-	Winter Harbor, Southwest Harbor, Bar Harbor, Northeast Harbor, Northwest Harbor
Upper Mid-Coast ME 2	-	Stonington, Sunshine/Deer Isle
Upper Mid-Coast ME 3	-	Rockland, St. George (Port Clyde), South Thomaston (Sprucehead), Owls Head, Friendship, Camden, Vinalhaven
Lower Mid-Coast ME 1	-	Bristol, South Bristol, Boothbay Harbor, East Boothbay (Boothbay), Breman (Medomak), Southport, Westport Island
Lower Mid-Coast ME 2	-	Sebasco Estates, Small Point, West Point, Five Islands, Phippsburg
Lower Mid-Coast ME 3	Portland	Cundys Harbor, Orrs Island, Yarmouth, Harpswell, East Harpswell, South Harpswell, Bailey Island, Cape Elizabeth
Southern Maine	-	York, York Harbor, Camp Ellis, Kennebunkport, Kittery, Cape Porpoise, Ogunquit, Saco, Wells
New Hampshire	Portsmouth	Rye, Hampton, Seabrook
North Shore MA	Gloucester	Rockport, Newburyport, Beverly, Salem, Marblehead, Manchester, Swampscott
South Shore MA	Boston	Scituate, Plymouth, Marshfield (Green Harbor)
Cape Cod MA	Chatham/ Harwichport	Provincetown, Sandwich, Barnstable, Wellfleet, Woods Hole, Yarmouth, Orleans, Eastham
Islands MA	-	Nantucket, Oak Bluffs, Tisbury, Edgartown
South Coast MA	New Bedford/ Fairhaven	Dartmouth, Westport
Western RI	Point Judith	Charlestown, Westerly, South Kingstown (Wakefield), North Kingstown (Wickford)
Eastern RI	-	Newport, Tiverton, Portsmouth, Jamestown, Middletown, Little Compton
Connecticut	-	Stonington, New London, Noank, Lyme, Old Lyme, East Lyme, Groton, Waterford
Long Island NY	Montauk/ Hampton Bays/ Shinnecock/ Greenport	Mattituck, Islip, Freeport, Brooklyn, Other Nassau and Suffolk Counties
Northern NJ	-	Point Pleasant, Belford, Long Beach/Barnegat Light, Barnegat, Highlands, Belmar, Sea Bright, Manasquan
Southern NJ	-	Cape May, Wildwood, Burleigh, Sea Isle City, Ocean City, Stone Harbor, Avalon

Table 42 - FY2012 landings (lbs.) of selected groundfish stocks by homeports

State	Port	GB Yellowtail Flounder	SNE/MA Yellowtail Flounder	CC/GOM Yellowtail Flounder	Witch flounder	GB Winter flounder	GOM Winter flounder	Total
ME	Portland	254	0	2,401	250,774	6,126	172,610	432,165
	Other	0	0	41,067	222,727	0	441,965	705,759
NH	Portsmouth	0	0	23,716	3,413	c	170,360	197,489
	Other	0	0	75,288	32,165	0	451,550	559,003
MA	Boston	30,126	12,819	356,281	490,721	15,471	692,359	1,597,777
	Chatham/Harwichport	c	0	13,450	55,702	0	c	*69,152
	Gloucester	3,073	104	453,490	339,481	5,357	1,646,086	2,447,591
	New Bedford/Fairhaven	284,578	94,107	366,042	370,627	45,504	105,227	1,266,085
	Other	c	1,391	500,517	145,529	c	744,294	*1,391,731
RI	Point Judith	25,915	539,433	c	30,140	306	c	*595,794
	Other	35,139	118,645	c	12,483	c	c	*166,267
NY	Eastern Long Island	c	119,561	0	6,922	c	0	*126,483
	Other	0	13,069	0	912	0	c	*13,981
**Other		11,194	24,649	20,022	60,625	391	105,023	221,904
Total		***390,279**	**923,778**	**1,852,274**	**2,022,221**	***73,155**	***4,529,474**	**4,798,273**

Notes:
** = Includes states not listed and landings from CPH permits not attributed to a state.
c = Confidential, because less than three ownership groups are included.
* = Total does not include confidential data.
Data from NEFSC, November 2013.

6.5.6.2 Vessel Activity in Primary Ports

All states have shown a decline in the number of active vessels with revenue from any species since at least FY2009 (Table 43). In FY2012, Massachusetts had the highest number of active vessels with a limited access groundfish permit and also the highest number of active vessels with revenue from at least one groundfish trip (52%, 207 vessels) (Table 44). From FY2009 to FY2012, the total number of active vessels with revenue from at least one groundfish trip declined 29% (566 to 401). While all states showed a decline in the number of vessels making groundfish trips, the largest percentage decline occurred in New Jersey (-57%).

Table 43 - Number of vessels with revenue from any species (all trips) by homeport and state

Home Port State/City	FY2009	FY2010	FY2011	FY2012
CT	12	11	11	10
MA	459	423	378	375
Boston	62	52	49	47
Chatham	42	43	39	38
Gloucester	110	105	91	92
New Bedford	86	69	70	69
ME	112	102	88	95
Portland	17	17	16	18
NH	53	50	46	41
NJ	61	56	49	47
NY	95	93	91	88
RI	93	86	83	77
Point Judith	48	45	44	44
Other Northeast	34	36	34	37
Grand Total*	**916**	**854**	**776**	**764**

* Note: State vessel counts may exceed the grand total vessel count because vessels may change home port during the fishing year.

Table 44 - Number of vessels with revenue from at least one groundfish trip by homeport and state

Home Port State/City	FY2009	FY2010	FY2011	FY2012
CT	8	7	5	5
MA	310	238	224	207
Boston	46	35	34	28
Chatham	28	26	26	23
Gloucester	97	74	70	61
New Bedford	51	33	37	36
ME	64	43	47	51
Portland	15	15	15	16
NH	40	32	29	25
NJ	26	21	17	11
NY	47	40	42	43
RI	61	55	49	54
Point Judith	33	31	28	33
Other Northeast	12	10	8	6
Grand Total*	**566**	**445**	**419**	**401**

* Note state vessel counts may exceed the grand total vessel count because vessels may change home port during the fishing year.

6.5.6.3 Employment

Along with the restrictions associated with presenting confidential information, there is also limited quantitative socio-economic data upon which to evaluate the community-specific importance of the multispecies fishery. In addition to the direct employment of captains and crew, the industry is known to support ancillary businesses such as gear, tackle, and bait suppliers; fish processing and transportation; marine construction and repair; and restaurants. Regional economic models do exist that describe some of these inter-connections at that level (Clay et al. 2007; NMFS 2010; Olson & Clay 2001a; b; Thunberg 2007).

Throughout the Northeast, many communities benefit indirectly from the multispecies fishery, but these benefits are often difficult to attribute. The direct benefit from employment in the fishery can be estimated by the number of crew positions.[20] However, crew positions do not equate to the number of jobs in the fishery and do not make the distinction between full and part-time positions. In FY2012, vessels with limited access groundfish permits provided 2,146 crew positions, with 49% coming from vessels with homeports in Massachusetts (Table 45). Since at least FY2009, the total number of crew positions provided by limited access groundfish vessels has declined by. Changes in crew positions vary across homeport states, with Maine adding a few positions in FY2012.

Table 45 - Number of crew positions and crew days on active vessels by homeport and state

Home Port State		FY2009	FY2010	FY2011	FY2012
CT	Total crew positions	40	36	42	39
	Total crew days	3,700	3,996	3,001	4,312
MA	Total crew positions	1,231	1,132	1,067	1,053
	Total crew days	95,685	82,066	84,119	81,430
ME	Total crew positions	266	247	221	242
	Total crew days	15,539	15,541	14,783	16,252
NH	Total crew positions	110	107	105	96
	Total crew days	5,407	3,909	4,974	5,085
NJ	Total crew positions	162	149	145	148
	Total crew days	10,865	10,086	9,898	10,292
NY	Total crew positions	219	209	217	209
	Total crew days	16,997	15,772	16,031	14,908
RI	Total crew positions	267	253	248	232
	Total crew days	26,411	26,786	25,130	24,017
Other Northeast	Total crew positions	129	130	128	128
	Total crew days	12,615	11,784	11,480	11,322
Total	**Total crew positions**	**2,424**	**2,262**	**2,173**	**2,146**
	Total crew days	**187,219**	**169,939**	**169,417**	**167,620**

[20] Crew positions are measured by summing the average crew size of all active vessels on all trips.

A crew day[21] is another measure of employment opportunity that incorporates information about the time spent at sea earning a share of the revenue. Conversely, crew days can be viewed as an indicator of time invested in the pursuit of "crew share" (the share of trip revenues received at the end of a trip). The time spent at sea has an opportunity cost. For example, if crew earnings remain constant, a decline in crew days would reveal a benefit to crew in that less time was forgone for the same amount of earnings. In FY2012, vessels with limited access groundfish permits used 167,620 crew days, with 48% coming from vessels with homeports in Massachusetts (Table 45). Since at least FY2009, the total number of crew days used by limited access groundfish vessels across the Northeast has declined, though some states had an increase in crew days in FY2012.

The number of crew positions and crew days give some indication of the direct benefit to communities from the multispecies fishery through employment. But these measures, by themselves, do not show the benefit or lack thereof at the individual level. Many groundfish captains and crew are second- or third-generation fishermen who hope to pass the tradition on to their children. This occupational transfer is an important component of community continuity as fishing represents an important occupation in many of the smaller port areas.

6.5.7 Consolidation and Redirection

The multiple regulatory constraints placed on common pool groundfish fishermen are intended to control their effort and catch per unit effort (CPUE) as a means to limit mortality. Exemptions to many of these controls, which have been granted to sectors, may increase the CPUE of sector participants. As a result, sector fishermen may have additional time that they could direct towards non-groundfish stocks that they otherwise would not have pursued, resulting in redirection of effort into other fisheries. Additionally, to maximize efficiency, fishermen within a single sector may be more likely to allocate fishing efforts such that some vessels do not fish at all. This is referred to as fleet consolidation.

Both redirection and consolidation have been observed when management regimes for fisheries outside the Northeast US shifted toward a catch share management regime such as sectors. For example, research following the rationalization of the halibut and sablefish fisheries by the North Pacific Fishery Management Council found individuals who received enough quota shares were able to continue fishing with less competition, greater economic certainty, and over a longer fishing season (Matulich & Clark 2001). However, individuals who did not receive enough of a catch share either bought or leased catch shares from other fishermen or sold their quota. Similarly, one year after implementation of the Bering Sea-Aleutian Island crab fishery Individual Transferable Quota (ITQ), a study found that about half of the vessels that fished the 2004/2005 Bering Sea Snow Crab fishery did not fish the following year. However, research on the ITQ plan for the British Columbia halibut fishery found efficiency gains were greatest during the first round of consolidation, and little incentive to increase efficiency (or continue consolidation) existed afterward (Pinkerton & Edwards 2009). The scope of consolidation and redirection of effort that may be expected to result from sector operations in FY2014 is difficult to predict.

[21] Similar to a "man-hour," a "crew day" is calculated by multiplying a vessel's crew size by the days absent from port. Since the number of trips affects the crew-days indicator, the indicator is also a measure of work opportunity.

6.5.8 Regulated Groundfish Stock Catch

The Northeast Multispecies FMP specifies Annual Catch Limits (ACLs) for 20 stocks. Exceeding an ACL for a stock results in the implementation of Accountability Measures (AMs) to prevent overfishing. The ACL is sub-divided into different components. Those components that are subject to AMs are referred to as sub-ACLs. There are also components of the fishery that are not subject to AMs. These include state waters catches that are outside of federal jurisdiction, and a category referred to as "other sub-components" that combines small catches from various fisheries.

Table 46 to Table 48 compare FY2013 catches to ACLs. As shown in Table 47, catches exceed ACLs for only three stocks: GOM haddock, GOM/GB windowpane flounder and SNE/MA windowpane flounder.

Table 48 summarizes catches by non-groundfish components of the ACLs. Assignment of catches to a specific FMP is difficult unless the FMP uses a specific gear (e.g. the scallop fishery) or has a trip activity declaration (e.g. groundfish and monkfish trips). For this reason, the assignment of catch to FMP should be viewed with caution.

Table 46 – FY 2013 Catches of Regulated Groundfish Stocks (Metric Tons, Live Weight)

Stock	Components with ACLs and sub-ACLs; (with accountability measures (AMs))								sub-components: No AMs	
	Total Catch (mt)	Groundfish Fishery	Sector	Common Pool	Recreational	Midwater Trawl Herring Fishery	Scallop Fishery	Small Mesh Fisheries	State Water	Other
	A to H	A+B+C	A	B	C	D	E	F	G	H
GB cod	1,616.3	1,572.9	1,540.6	32.3					9.2	34.2
GOM cod	1,418.8	1,380.1	732.0	8.8	639.3				35.8	2.9
GB Haddock	3,330.1	2,977.5	2,977.1	0.4		290.0			6.1	56.5
GOM Haddock	405.7	402.9	169.2	2.2	231.5	0.0			1.3	1.6
GB Yellowtail Flounder	93.3	55.8	55.8	0.0			37.5	2.5	0.0	0.0
SNE Yellowtail Flounder	466.1	373.3	281.9	91.4			48.6		14.5	29.8
CC/GOM Yellowtail Flounder	453.1	380.5	376.5	4.1					42.8	29.7
Plaice	1,444.6	1,395.2	1,391.6	3.6					19.6	29.8
Witch Flounder	745.2	642.3	638.9	3.4					27.1	75.8
GB Winter Flounder	1,763.1	1,722.0	1,722.0	0.0					0.0	41.0
GOM Winter Flounder	245.6	169.3	167.6	1.7					67.4	8.9
SNE/MA Winter Flounder	1,025.9	788.6	670.4	118.3					55.7	181.6
Redfish	4,023.5	4,000.6	3,996.2	4.4					19.0	3.9
White Hake	2,056.3	2,045.6	2,039.8	5.8					2.3	8.3
Pollock	7,029.1	4,915.0	4,878.4	36.5					981.7	1,132.4
Northern Windowpane	280.1	237.5	237.3	0.2					0.9	41.6
Southern Windowpane	554.7	115.9	86.0	30.0					37.3	272.4
Ocean Pout	59.3	33.2	27.3	5.9			129.1		1.5	24.6
Halibut	79.0	54.7	53.8	0.9					22.8	1.5
Wolffish	19.1	17.1	17.1	0.0					1.3	0.7

Notes: Data Source: NMFS Greater Atlantic Regional Office Northeast Multispecies Final Year-End Results from Fishing Year 2013. October 20th, 2014.

Catch includes any FY2011 carryover caught by sectors in FY2012. Data as of Nov. 5, 2013, Northeast Regional Office. Values for a non-allocated species may include landings of that stock; misreporting of species and/or stock area; and/or estimated landings (in lieu of missing reports) based on vessel histories.

*Recreational estimates based on Marine Recreational Information Program (MRIP) data. **Landings extrapolated from observer data.

Table 47 – FY2013 Catches as Percent of ACL

Stock	Components with ACLs and sub-ACLs; (with accountability measures (AMs))								sub-components: No AMs	
	Total Catch (%)	Groundfish Fishery	Sector	Common Pool	Recreational	Midwater Trawl Herring Fishery	Scallop Fishery	Small Mesh Fisheries	State Water	Other
	A to H	A+B+C	A	B	C	D	E	F	G	H
GB cod	84.8	87.0	86.8	101.0					46.0	42.8
GOM cod	96.5	104.9	90.2	48.9	131.5				34.7	5.7
GB Haddock	11.9	11.4	11.4	0.5		106.2			2.1	4.8
GOM Haddock	147.9	154.4	91.2	108.9	312.2				30.4	25.3
GB Yellowtail Flounder	44.7	36.1	36.5	0.4			90.3	63.7	NA	0.6
SNE Yellowtail Flounder	70.1	63.7	57.8	93.1			111.4		206.5	106.3
CC/GOM Yellowtail Flounder	86.7	79.4	80.9	31.5					130.2	271.3
Plaice	97.5	98.3	99.8	14.3					63.0	95.7
Witch Flounder	99.2	105.3	106.6	30.6					115.5	64.5
GB Winter Flounder	48.4	48.8	49.1	0.0					NA	36.5
GOM Winter Flounder	23.6	23.7	24.4	6.6					24.8	16.5
SNE/MA Winter Flounder	63.6	65.2	62.4	87.0					23.7	108.1
Redfish	38.5	39.5	39.6	10.9					17.3	1.8
White Hake	51.7	53.1	53.4	21.6					5.5	9.9
Pollock	47.1	38.1	38.1	40.2					104.9	103.7
Northern Windowpane	195.0	242.4	NA	NA					62.2	95.0
Southern Windowpane	105.3	113.7	NA	NA			70.5		67.9	146.4
Ocean Pout	26.9	16.9	NA	NA					62.6	116.4
Halibut	82.1	105.2	NA	NA					57.5	31.0
Wolffish	29.3	27.6	NA	NA					185.0	26.3

Table 48 - FY2013 Catches by Non-Groundfish FMPs (Metric Tons, Live Weight)

Stock	Total	Scallop[1]	Fluke	Hagfish	Herring	Lobster/Crab	Menhaden	Monkfish	Research	Scup
GB cod	34.2	4.9	0.3	0	1.4	0.8	0.3	0.2	14.5	0.1
GOM cod	2.9	0.2	-	0	1.3	0.3	-	-	0.1	-
GB Haddock	56.5	3.5	0.1	0	5.2	0	0	0	0.5	0.1
GOM Haddock	1.6	0	-	-	0.3	-	-	-	0	-
GB Yellowtail Flounder	0	-	-	-	-	-	-	-	-	0
SNE Yellowtail Flounder	29.8	-	5.7	-	1.3	0	0	0	1.3	5.6
CC/GOM Yellowtail Flounder	29.7	23.2	-	-	1.3	-	-	-	2.1	-
Plaice	29.8	13.5	0.7	-	1.3	0	0	0	0.8	0.8
Witch Flounder	75.8	26.7	5.7	0	3.3	0.1	0.1	0	0.6	4.7
GB Winter Flounder	41	25	-	-	1.5	-	-	-	-	0.1
GOM Winter Flounder	8.9	6	-	0	0.2	0	-	-	0.1	-
SNE/MA Winter Flounder	181.6	78.2	10.8	-	4.7	0	0.1	0	19.9	9.7
Redfish	3.9	0	0	0	1	0.4	0.1	0	0	0
White Hake	8.3	1	0.1	0	2	1	0.3	0.1	0.1	0.2
Pollock	1,132.4	0	0	0	0.6	0.1	0	0	0.1	0
Northern Windowpane	41.6	40.7	-	0	0.2	0	-	-	0	0
Southern Windowpane	272.4	-	66.9	-	3	0.1	0.5	0	0	69.6
Ocean Pout	24.6	2.9	0.5	0	2	0	0	0	0	0.5
Halibut[2]	1.5	0.2	0	0	0.1	0.6	0	0	0	0
Wolffish	0.7	0.5	0	-	0	0	0	0	0	0

Notes:

Data Source: NMFS Greater Atlantic Regional Office Northeast Multispecies Final Year-End Results from Fishing Year 2013. October 20th, 2014.

Values are in metric tons of live weight.

[1]Scallop values based on scallop fishing year March 2013 through February, 2014.

[2]Note some Canadian landings of this stock are included in the most recent assessment for Atlantic halibut (2012 Assessment Update). However, Canadian landings for 2013 have not yet been reported to the Northwest Atlantic Fisheries Organization (NAFO), and, as a result, are not included here.

Table 48– **Cont.**

Stock	Shrimp	Squid	Squid/Whiting	Surfclam	Tilefish	Whelk/Conch	Whiting	Unknown	Rec.
GB cod	0	0.6	0.6	0	0	0.1	0	2.5	8
GOM cod	-	-	0.2	-	-	0	0.4	0.5	-
GB Haddock	0	14.8	15.5	0	0	0	0	16.7	-
GOM Haddock	-	-	0.3	-	-	-	0.5	0.5	-
GB Yellowtail Flounder	-	-	0	-	-	-	-	0	
SNE Yellowtail Flounder	0	2	2.2	-	-	-	0	11.7	
CC/GOM Yellowtail Flounder	-	-	0.6	-	-	-	1.3	1.3	
Plaice	0	3.6	3.9	-	-	-	0.1	5.1	
Witch Flounder	0	8.7	9.9	0	0	0	0.2	15.8	
GB Winter Flounder	-	0.5	12.7	-	-	-	-	1.3	
GOM Winter Flounder	-	-	0.1	-	-	0	0.2	2.3	0.1
SNE/MA Winter Flounder	0	14.5	11.2	-	-	-	0	32.4	0
Redfish	0	0.6	0.7	0	0	0	0	0.9	
White Hake	0	0.6	1.3	0	0	0	0	1.5	
Pollock	0	1	1	0	0	0.1	0	1.3	1128
Northern Windowpane	-	0	0.6	0	-	0	0	0.1	
Southern Windowpane	0	12.3	19	0	0	0	0	100.9	
Ocean Pout	0	5.6	5.9	0	0	0	0.1	6.9	
Halibut[2]	0	0.1	0.2	0	0	0	0	0.3	
Wolffish	0	0	0	-	-	-	0	0.1	

6.5.9 Fishery Sub-Components

6.5.9.1 Sector Harvesting Component

In FY2010, the sector vessels landed the overwhelming majority of the groundfish ACL. Each sector receives a total amount of fish it can harvest for each stock, its Annual Catch Entitlement (ACE). Since the ACE is dependent on the amount of the ACL in a given fishing year, the ACE may be higher or lower from year to year even if the sector's membership remains the same. There are substantial shifts in ACE for various stocks between FY2009 and FY2012 (Table 29). There has been a general decrease in trips, and catch for sector vessels, and there has been a shift in effort out of the groundfish fishery into other fisheries. However, these changes may correlate to a certain extent with the decrease in ACL.

Combined, 161M (live) pounds of ACE was allotted to the sectors in FY2011, but only 70M (live) pounds were landed. Of the 16 stocks allocated to sectors, the catch of 7 stocks approached (>80% conversion) the catch limit set by the ACE (Table 30). By comparison, the catch of only five stocks approached the catch limit set by the total allocated ACE in FY2010. The catch of white hake in FY2011 was particularly close to reaching the limit, with 98% of the white hake ACE being realized. As was the case in FY2010, the majority of the unrealized landings in 2011 were caused by a failure to land Georges Bank haddock. Collectively, East and West GB haddock, accounted for 63M pounds (62%) of the uncaught ACE in FY2011.

Table 49 - Commercial groundfish sub-ACL, FY 2009 to FY 2012

Groundfish Stock	FY2009 TAC (lbs)	FY2010 ACL (lbs)	% Change 2009 to 2010	FY2011 ACL (lbs)	% Change 2010 to 2011	FY2012 ACL (lbs)	% Change 2011 to 2012
GB cod W	10,965,793	6,816,693	-37.84%	9,041,157	32.63%	9,795,138	8.34%
GB cod E	1,161,836	745,162	-35.86%	440,925	-40.83%	357,149	-19.00%
GOM Cod	23,642,373	10,068,512	-57.41%	10,637,304	5.65%	4,310,037	-59.48%
GB haddock W	171,861,356	62,725,923	-63.50%	46,164,798	-26.40%	45,322,632	-1.82%
GB haddock E	24,471,311	26,429,016	8.00%	21,252,562	-19.59%	15,167,804	-28.63%
GOM Haddock	3,448,030	1,818,814	-47.25%	1,715,196	-5.70%	1,439,619	-16.07
GB Yellowtail Flounder	3,564,875	1,814,404	-49.10%	2,517,679	38.76%	479,946	80.94%
SNE/MA Yellowtail Fl.	857,598	683,433	-20.31%	1,155,222	69.03%	1,675,513	45.04%
CC/GOM Yellowtail Fl.	1,895,975	1,717,401	-9.42%	2,072,345	20.67%	2,306,035	11.28%
Plaice	7,085,657	6,278,765	-11.39%	6,851,967	9.13%	7,226,753	5.47%
Witch Flounder	2,489,019	1,878,338	-24.53%	2,724,914	45.07%	3,192,294	8.34%
GB Winter Flounder	4,418,064	4,082,961	-7.58%	4,424,678	8.37%	7,467,057	68.76%
GOM Winter Flounder	835,552	348,330	-58.31%	348,330	0.00%	1,576,305	352.53%
Redfish	18,990,619	15,092,846	-20.52%	16,625,059	10.15%	18,653,483	10.40
White Hake	5,238,183	5,635,015	7.58%	6,556,548	16.35%	7,237,776	10.39%
Pollock	13,990,535	36,493,118	160.84%	30,758,895	-15.71%	27,804,700	-9.60%
Totals	**294,916,777**	**182,628,733**	**-38.07%**	**163,287,579**	**-10.59%**	**153,712,242**	**-5.86%**

Table 50 - Annual Catch Entitlement (ACE) and catch (Live lbs.)

	2010			2011			2012		
	Allocated ACE	**Catch**	**% caught**	**Allocated ACE***	**Catch**	**% caught**	**Allocated ACE***	**Catch**	**% caught**
Cod, GB East	717,441	562,610	*78%*	**431,334**	**357,578**	***83%***	350,835	148,576	*42%*
Cod, GB West	**6,563,099**	**5,492,557**	***84%***	9,604,207	6,727,837	*70%*	10,542,407	3,363,415	*32%*
Cod, GOM	**9,540,389**	**7,991,172**	***84%***	**11,242,220**	**9,561,153**	***85%***	9,008,557	4,808,408	*53%*
Haddock, GB East	26,262,695	4,122,910	*16%*	21,122,565	2,336,964	*11%*	15,126,216	806,562	*5%*
Haddock, GB West	62,331,182	13,982,173	*22%*	50,507,974	6,101,400	*12%*	51,898,296	1,832,577	*4%*
Haddock, GOM	1,761,206	819,069	*47%*	1,796,740	1,061,841	*59%*	1,599,136	540,299	*34%*
Plaice	6,058,149	3,305,950	*55%*	7,084,289	3,587,356	*51%*	7,771,254	3,530,494	*45%*
Pollock	35,666,741	11,842,969	*33%*	32,350,451	16,297,273	*50%*	30,670,586	14,097,873	*46%*
Redfish	14,894,618	4,647,978	*31%*	17,369,940	5,951,045	*34%*	19,933,122	9,751,824	*49%*
White hake	**5,522,677**	**4,687,905**	***85%***	**6,708,641**	**6,598,273**	***98%***	7,527,513	5,394,273	*72%*
Winter flounder, GB	4,018,496	3,036,352	*76%*	**4,679,039**	**4,241,177**	***91%***	7,752,484	4,256,996	*55%*
Winter flounder, GOM	293,736	178,183	*61%*	750,606	343,152	*46%*	1,590,301	568,828	*36%*
Witch flounder	**1,824,125**	**1,528,215**	***84%***	2,839,697	2,178,941	*77%*	3,409,459	2,162,678	*63%*
Yellowtail flounder, CC/GOM	1,608,084	1,268,961	*79%*	**2,185,802**	**1,743,168**	***80%***	**2,448,240**	**2,103,947**	***86%***
Yellowtail flounder, GB	**1,770,451**	**1,625,963**	***92%***	**2,474,662**	**2,176,921**	***88%***	802,654	474,540	*59%*
Yellowtail flounder, SNE	517,372	340,662	*66%*	**963,033**	**795,267**	***83%***	1,422,815	938,303	*66%*
Total	179,350,461	65,433,630	*36%*	172,111,201	70,059,346	*41%*	171,853,874	54,779,592	*32%*

Notes:
*includes carryover from the prior fishing year.
Stocks with > 80% ACE conversion highlighted in bold.
2010 and 2011 data from Murphy et al (Table 37, 2012). FY12 data from NERO.

6.5.9.2 Common Pool Harvesting Component

With the adoption of Amendment 16, most commercial groundfish fishing activity occurs under sector management regulations. There are, however, a few vessels that are not members of sectors and continue to fish under the effort control system. Collectively, this part of the fishery is referred to as the “common pool.” These vessels fish under both limited access and open access groundfish fishing permits. Common pool vessels accounted for only a small amount of groundfish catch in FY2013 (Table 46). The largest common pool catch (pollock, 67.8 mt) was only 0.8% of the total groundfish fishery catch of this stock. Common pool vessels caught 0.8% of the GOM cod and 0.2% of the GOM haddock groundfish fishery catch.

Common pool vessels with limited access permits landed 1.3M lbs. (landed lbs.) of regulated groundfish in FY2010, worth over $2M in ex-vessel revenues (Table 51). Landings declined to 518K lbs., worth about $850,000 in FY2011and declined again in FY2012 to 358K lbs., worth $642,000. Most common pool vessel groundfish fishing activity takes place in the state of Massachusetts. From FY2010 to FY2011, the activity from Maine ports declined dramatically and from FY2011 to FY2012 the decline can be seen in Massachusetts (Table 52). The primary ports for this activity over the last 4 years (FY2009-2012) are Gloucester, Portland, and New Bedford (Table 53).

Table 51 - Summary of common pool fishing activity

		A	C	D	E	HA	Total
FY2010	Permits landing groundfish	78	4	6	5	33	**126**
	Groundfish lbs. landed	1,256,311	1,843	2,012	596	35,367	**1,296,129**
	Groundfish revenues	$1,981,076	$4,727	$3,643	$682	$64,056	**$2,054,184**
FY2011	Permits landing groundfish	61	6	3	12	32	**115**
	Groundfish lbs. landed	401,715	31,844	2,836	1,990	80,441	**518,831**
	Groundfish revenues	$601,506	$62,408	$7,042	$2,634	$175,929	**$849,526**
FY2012	Permits landing groundfish	56	6		8	25	**98**
	Groundfish lbs. landed	281,212	52,955		1,954	22,251	**358,414**
	Groundfish revenues	$479,051	$109,630		$2,522	$51,132	**$642,414**

Notes: Confidential data excluded.

Table 52 - Common pool groundfish landings by state of trip (landed lbs.)

	FY2010	FY2011	FY2012
CT	1,574	2,561	1,579
MA	809,231	372,282	169,662
MD		88	375
ME	344,783	49,559	49,260
NC	315		
NH	6,547	25,912	26,634
NJ	13,128	19,060	20,628
NY	94,900	37,115	58,331
RI	24,712	12,248	31,944
VA	916		
Total	**1,296,106**	**518,825**	**358,414**

Note: Confidential data removed

Table 53 - Common pool groundfish landings by port (landed lbs.)

Port	FY2010	FY2011	FY2012
Gloucester, MA	372,481	260,347	150,405
Portland, ME	333,852	40,520	34,054
New Bedford, MA	278,221	39,884	8,248
Provincetown, MA	100,952	51,561	2,116
Montauk, NY	75,460	17,894	54,212
Sandwich, MA	40,385	2,666	0
Point Judith, RI	3,478	4,708	13,161
Little Compton, NY	20,787	7,478	15,952
Hampton Bays, NY	13,512	6,807	3,770
Plymouth, MA	4,527	4,444	0
Rye, NH	1,491	20,304	21,845
Point Pleasant, NJ	9,043	16,932	15,195

The primary groundfish stocks landed by common pool vessels include GOM cod, GB cod, and pollock (Table 54). GB haddock was an important component in FY2010 but not in FY2011 or FY2012. Vessels using HA and HB permits on groundfish trips primarily target GB and COM cod, GOM haddock, and pollock.

For the common pool permits that landed at least one pound of regulated groundfish in either FY2010 or FY2011, groundfish revenues were a major portion of revenues on groundfish fishing trips. Groundfish revenues were 80% or more of the trip revenues for 49% of these vessels; they were 60% of the revenues for 61.5% of these vessels. Dependence on groundfish was greatest for HA permitted vessels, with 70% of these vessels earning all revenues on these trips from regulated groundfish.

Table 54 - Common pool landings (landed lbs.) by permit category and stock

FY2010 Landings	A	C	D	E	HA	Total
GB Cod W	109,582	1,120	1,269		6,179	118,150
GOM Cod	350,947	651			17,048	368,646
GB Haddock W	177,033				202	177,235
GOM Haddock	12,257				995	13,252
GB Yellowtail Flounder	17,260					17,260
SNE Yellowtail Flounder	32,901			596		33,497
CC/GOM Yellowtail Flounder	35,969				245	36,214
Plaice	48,020				112	48,133
Witch Flounder	57,158					57,158
GB Winter Flounder	13,011					13,011
GOM Winter Flounder	45,172				250	45,423
SNE Winter Flounder	4,646					4,646
Redfish	14,007				763	14,769
White Hake	68,756				139	68,894
Pollock	265,840		730		9,156	275,726
Southern Windowpane	3,566					3,566
Halibut	162				255	417
Wolffish	3					3
Total	**1,256,290**	**1,771**	**1,999**	**596**	**35,344**	**1,296,000**
FY2011 Landings	**A**	**C**	**D**	**E**	**HA**	**Total**
GB Cod W	102,450	3,186	168		15,577	121,382
GB Cod E	3,340					3,340
GOM Cod	53,984	18,816	2,666		54,982	130,448
GB Haddock W	33,053				85	33,138
GOM Haddock	1,945	161			763	2,869
GB Yellowtail Flounder	3,944			1,521		5,465
SNE Yellowtail Flounder	25,272					25,272
CC/GOM Yellowtail Flounder	23,408	66		19		23,493
Plaice	10,213	686				10,899
Witch Flounder	9,448	972				10,420
GB Winter Flounder	2,411					2,411
GOM Winter Flounder	5,257	374				5,631
SNE/MA Winter Flounder	816					816
Redfish	7,208	38			147	7,393
White Hake	19,901	2,890			177	22,968
Pollock	89,533	4,653			7,644	101,830
Northern Windowpane	850					850
Southern Windowpane	8,607					8,607
Halibut					1,065	1,065
Total	**401,640**	**31,842**	**2,834**	**1,540**	**80,441**	**518,297**

FY2012 Landings	A	C	D	E	HA	Total
GB Cod W	38,725	266			9,428	48,419
GOM Cod	13,209	22,379	16		8,983	44,587
GB Haddock W	13,373					13,373
GOM Haddock	1,117	420			470	2,007
GB Yellowtail Flounder	758			1,550		2,308
SNE Yellowtail Flounder	77,293			285		77,578
CC/GOM Yellowtail Flounder	876	799				1,675
Plaice	4,028	1,443				5,471
Witch Flounder	3,671	795				4,466
GB Winter Flounder	1,626					1,626
GOM Winter Flounder	669	1,775				2,444
SNE Winter Flounder	278					278
Redfish	11,678	253			25	11,956
White Hake	19,936	10,586			160	30,682
Pollock	92,614	14,221			3,122	109,957
Southern Windowpane	940					940
Ocean Pout		18				18
Halibut	218					218
Total	**281,010**	**52,955**	**16**	**1,835**	**22,188**	**358,004**

6.5.9.3 Recreational Harvesting Component

The recreational fishery includes private anglers, party boat operators, and charter vessel operators. Several groundfish stocks are targeted by the recreational fishery, including GOM cod, GOM haddock, pollock, and GOM winter flounder. GB cod and haddock are targeted as well, but to a lesser extent. SNE/MA winter flounder is also a target species. Amendment 16 (Section 6.2.5, NEFMC 2009) included a detailed overview of recreational fishing activity.

Recreational removals of GOM cod declined by 72% from FY2011 to FY2012, but then increased slightly in FY2013. Removals of GOM haddock were more equivalent through the time series. The number of angler trips also declined by about 30% (Table 55). There were 122 active party or charter vessels catching cod or haddock in the Gulf of Maine in 2013, down from of 188-195 vessels between 2004-2010.

Table 55 - Recent recreational fishing activity for GOM cod and GOM haddock

	FY2011	FY2012	FY2013
Angler Trips	235,343	182,999	225,624
Cod Total Catch (numbers, a+b1+b2)	1,389,408	846,655	879,366
Cod Removals (numbers, a+b1+(0.3*b2)))	773,085	410,231	491,568
Cod Removals (weight, mt)	2,116	596	706
Haddock Total Catch (numbers, a+b1+b2)	184,709	369,427	654,227
Haddock Total removals (numbers, a+b1)	146,042	166,610	146,976
Haddock Total Removal (weight, mt)	231	211	256

Note: FY2013 catches are an estimate since not all data are available.

Table 56 - Recreational vessels catching cod or haddock from the Gulf of Maine

Calendar Year	Party	Charter	Total
1999	53	100	153
2000	48	103	151
2001	59	116	175
2002	43	130	173
2003	53	128	181
2004	64	124	188
2005	60	135	195
2006	62	126	188
2007	52	133	185
2008	54	128	182
2009	48	131	179
2010	60	135	195
2011	47	128	175
2012	44	108	152
2013	31	89	120

Notes: Includes catch (kept and discarded) from any of the Gulf of Maine statistical areas.
Source: NERO, January 2014.

Table 57 - FY 2011 - FY 2013 GOM Cod and Haddock Recreational Catch Evaluation (mt)

		Recreational Catch				
Stock	Fishing Year	Catch A + B	Landings A	Discard B	Recreational sub-ACL	Percent of Catch Limit Taken
GOM Cod	2011	1,640.3	1,640.3	NA*	2,824	58.1
	2012	937.4	634.6	302.8	2,215	42.3
	2013	639.3	540.6	98.8	486	131.5
	Average	**1,072.4**	**938.5**	**133.8**	**1,842**	**58.2**
GOM Haddock	2011	238.5	238.5	NA*	308	77.4
	2012	280.7	280.7	NA*	259	108.4
	2013	231.5	231.5	0.0	74	312.2
	Average	**250.2**	**250.2**	**0.0**	**214**	**117.1**

*Estimates not applicable. Recreational discards are not attributed to the ACL consistent with the most recent assessments for these stocks used to set the respective quotas (GARM III). SARC 53 for GOM cod included recreational discards for the first time and was used to set quotas beginning in FY 2012. SARC 59 for GOM haddock included recreational discards for the first time and will be used to set quotas starting in FY 2015.

Recreational estimates based on Marine Recreational Information Program (MRIP) data.
Values in metric tons of live weight

Source: NMFS Greater Atlantic Regional Office
October 20, 2014

These data are the best available to NOAA's National Marine Fisheries Service (NMFS).

6.5.10 Relevant Analyses

This section provides analyses performed throughout the development of this framework adjustment action.

Table 58 - Comparison of recents ACLs (FY 2010 - FY 2014) and proposed ACLs for FY 2015 (Option 1/No Action and Option 2)

Stock	FY 2010 Total ACL (mt)	FY 2011 Total ACL (mt)	FY 2012 Total ACL (mt)	FY 2013 Total ACL (mt)	FY 2014 Total ACL (mt)	FY 2015 Total ACL (mt)			
						Option 1/ No Action	% change wrt FY 2014	Option 2	% change wrt FY 2014
GB cod	3,620	4,540	4,861	1,907	1,867	2,387	28%	1,886	1%
GOM cod	8,088	8,545	6,700	1,470	1,470	1,470	0%	366	-75%
GB Haddock	42,768	32,611	29,260	27,936	18,312	41,526	127%	23,204	27%
GOM Haddock	1,197	1,141	958	274	323	412	28%	1,376	326%
GB Yellowtail Flounder	1,021	1416	547.8	208.5	318.1	-	-	240	-25%
SNE Yellowtail Flounder	470	641	936	665	665	665	0%	665	0%
CC/GOM Yellowtail Flounder	822	992	1,104	523	523	523	0%	524	0%
Plaice	3,006	3,280	3,459	1,482	1,442	1,470	2%	1,470	2%
Witch Flounder	899	1,304	1,563	751	751	751	0%	751	0%
GB Winter Flounder	1,955	2,118	3,575	3,641	3,493	-	-	1,952	-44%
GOM Winter Flounder	231	524	1,040	1,040	1,040	-	-	489	-53%
SNE/MA Winter Flounder	605	842	603	1,612	1,612	1,612	0%	1,607	0%
Redfish	7,226	7,959	8,786	10,462	10,909	11,393	4%	11,393	4%
White Hake	2,697	3,138	3,465	3,974	4,417	4,484	2%	4,484	2%
Pollock	18,929	16,166	14,736	14,921	15,304	-	-	15,878	4%
Northern Windowpane	161	161	163	144	144	144	0%	144	0%
Southern Windowpane	225	225	381	527	527	527	0%	527	0%
Ocean Pout	253	253	240	220	220	220	0%	220	0%
Halibut	69	76	83	96	106	116	9%	97	-8%
Wolffish	77	77	77	65	65	65	0%	65	0%

Sources:
FY2010-FY2013 ACLs from year-end catch reports. FY2014 ACLs from Framework 51 final rule and revisions.

Table 59- FY 2010-2013 northern windowpane flounder catch.

Fishing Year	OFL	U.S. ABC	Total Catch Limit	Catch (mt)				% of Catch Limit Caught
				Total	Groundfish Fishery	State Waters	Other sub-Components	
2010	225	169	161	163	154	0	9	101%
2011	225	169	161	191	157	0	35	119%
2012	230	173	163	209	130	2	77	128%
2013	202	151	144	280	237	1	42	195%

Table 60- Other sub-compenent catch detail for northern windowpane flounder.

Fishing Year	U.S. ABC (mt)	Other sub-Component		% of sub-Component Caught	Other sub-Component Catch (mt)					
		% of ABC	Value (mt)		TOTAL	Scallop	Herring	Squid/ Whiting	Whiting	Unknown
2010	169	29%	49	19%	9.1	8.2	0.1	0.7	0.0	0.1
2011	169	29%	49	71%	34.8	33.0	0.2	1.4	0.1	0.1
2012	173	19%	33	233%	77.0	75.7	0.2	0.9	0.1	0.0
2013	151	29%	44	95%	41.6	40.7	0.2	0.6	0.0	0.1

Figure 20- Comparison of the proposed GOM cod spawning closure areas with existing WGOM rolling closure areas (month/block)

Comparison of Closures (Rolling and Spawning) by Block and Month across Common-Pool, Sectors, and Option 2

All blockas are west of 69.30W

Common-Pool is abbreviated C-P

Block 147

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May				
June	1	1	1	
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March				
April				

Block 146

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May				
June	1	1		
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March				
April				

Block 140

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1	1	1	
June	1	1	1	
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March				
April				

Block 139

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1	1	1	
June	1	1	1	
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March				
April				

Block 138

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1	1		
June				
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March				
April				

Block 133

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1	1	1	1
June	1		1	1
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March			1	1
April	1	1	1	1

Block 132

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1	1	1	
June	1		1	
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March			1	
April	1	1	1	

Block 131

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1			
June				
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March				
April	1			

Block 125

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1		1	1
June				
July				
August				
Sept.				
Oct.	1			
Nov.	1		1	1
Dec.			1	1
Jan.			1	1
Feb.				
March			1	
April	1	1	1	

Block 124

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May	1		1	
June				
July				
August				
Sept.				
Oct.	1			
Nov.	1		1	1
Dec.			1	1
Jan.			1	1
Feb.				
March			1	
April	1	1	1	

Block 123

	Rolling		Spawning	
	C-P	Sectors	Option A	Option B
May				
June				
July				
August				
Sept.				
Oct.				
Nov.				
Dec.				
Jan.				
Feb.				
March	1			
April	1			

Table 61 - Rollover Comparison of FY 2014 and FY 2015 (Option 2)

FY2014-FY2015 (Option 2) Comparison										
Stock	Total ACL 2014	35% Rollover of 2014 Total ACL	30% Rollover of 2014 Total ACL	25% Rollover of 2014 Total ACL	20% Rollover of 2014 Total ACL	15% Rollover of 2014 Total ACL	10% Rollover of 2014 Total ACL	*Option 2:* Total U.S. ABC 2015	*Option 2:* Total ACL 2015	% Change in ACL: 2014 to 2015
GB cod	1,867	**653**	**560**	**467**	**373**	**280**	**187**	1,980	1,886	**1%**
GOM cod	1,470	**515**	**441**	**368**	**294**	**221**	**147**	386	366	**-75%**
GB Haddock	18,312	**6,409**	**5,494**	**4,578**	**3,662**	**2,747**	**1,831**	24,366	23,204	**27%**
GOM Haddock	323	**113**	**97**	**81**	**65**	**48**	**32**	1,454	1,375	**326%**
GB Yellowtail Flounder	318	**111**	**95**	**80**	**64**	**48**	**32**	248	240	**-25%**
SNE Yellowtail Flounder	665	**233**	**200**	**166**	**133**	**100**	**67**	700	666	**0%**
CC/GOM Yellowtail Flounder	523	**183**	**157**	**131**	**105**	**78**	**52**	548	524	**0%**
Plaice	1,442	**505**	**433**	**361**	**288**	**216**	**144**	1,544	1470	**2%**
Witch Flounder	751	**263**	**225**	**188**	**150**	**113**	**75**	783	751	**0%**
GB Winter Flounder	3,493	**1,223**	**1,048**	**873**	**699**	**524**	**349**	2,124	1,952	**-44%**
GOM Winter Flounder	1,040	**364**	**312**	**260**	**208**	**156**	**104**	510	489	**-53%**
SNE/MA Winter Flounder	1,612	**564**	**484**	**403**	**322**	**242**	**161**	1,676	1,607	**0%**
Redfish	10,909	**3,818**	**3,273**	**2,727**	**2,182**	**1,636**	**1,091**	11,974	11,393	**4%**
White Hake	4,417	**1,546**	**1,325**	**1,104**	**883**	**663**	**442**	4,713	4,484	**2%**
Pollock	15,304	**5,356**	**4,591**	**3,826**	**3,061**	**2,296**	**1,530**	16,600	15,878	**4%**
Northern Windowpane	144	**50**	**43**	**36**	**29**	**22**	**14**	151	144	**0%**
Southern Windowpane	527	**184**	**158**	**132**	**105**	**79**	**53**	548	527	**0%**
Ocean Pout	220	**77**	**66**	**55**	**44**	**33**	**22**	235	220	**0%**
Halibut	106	**37**	**32**	**27**	**21**	**16**	**11**	109	97	**-8%**
Wolffish	65	**23**	**20**	**16**	**13**	**10**	**7**	70	65	**0%**

Table 62- Rollover Comparison of FY 2013 and FY 2014

FY2013-FY2014 Comparison										
Stock	Total ACL 2013	35% Rollover of 2013 Total ACL	30% Rollover of 2013 Total ACL	25% Rollover of 2013 Total ACL	20% Rollover of 2013 Total ACL	15% Rollover of 2013 Total ACL	10% Rollover of 2013 Total ACL	Total U.S. ABC 2014	Total ACL 2014	% Change in ACL: 2013 to 2014
GB cod	1,907	**667**	**572**	**477**	**381**	**286**	**191**	1,960	1,867	**-2%**
GOM cod	1,470	**515**	**441**	**368**	**294**	**221**	**147**	1,550	1,470	**0%**
GB Haddock	27,936	**9,778**	**8,381**	**6,984**	**5,587**	**4,190**	**2,794**	19,229	18,312	**-34%**
GOM Haddock	274	**96**	**82**	**69**	**55**	**41**	**27**	341	323	**18%**
GB Yellowtail Flounder	208.5	**73**	**63**	**52**	**42**	**31**	**21**	328	318	**53%**
SNE Yellowtail Flounder	665	**233**	**200**	**166**	**133**	**100**	**67**	700	665	**0%**
CC/GOM Yellowtail Flounder	523	**183**	**157**	**131**	**105**	**78**	**52**	548	523	**0%**
Plaice	1,482	**519**	**445**	**371**	**296**	**222**	**148**	1,515	1,442	**-3%**
Witch Flounder	751	**263**	**225**	**188**	**150**	**113**	**75**	783	751	**0%**
GB Winter Flounder	3,641	**1,274**	**1,092**	**910**	**728**	**546**	**364**	3,598	3,493	**-4%**
GOM Winter Flounder	1,040	**364**	**312**	**260**	**208**	**156**	**104**	1,078	1,040	**0%**
SNE/MA Winter Flounder	1,612	**564**	**484**	**403**	**322**	**242**	**161**	1,676	1,612	**0%**
Redfish	10,462	**3,662**	**3,139**	**2,615**	**2,092**	**1,569**	**1,046**	11,465	10,909	**4%**
White Hake	3,974	**1,391**	**1,192**	**994**	**795**	**596**	**397**	4,642	4,417	**11%**
Pollock	14,921	**5,222**	**4,476**	**3,730**	**2,984**	**2,238**	**1,492**	16,000	15,304	**3%**
Northern Windowpane	144	**50**	**43**	**36**	**29**	**22**	**14**	151	144	**0%**
Southern Windowpane	527	**184**	**158**	**132**	**105**	**79**	**53**	548	527	**0%**
Ocean Pout	220	**77**	**66**	**55**	**44**	**33**	**22**	235	220	**0%**
Halibut	96	**34**	**29**	**24**	**19**	**14**	**10**	109	106	**10%**
Wolffish	65	**23**	**20**	**16**	**13**	**10**	**7**	70	65	**-1%**

Table 63 - Rollover Comparison of FY 2012 and FY 2013

FY2012-FY2013 Comparison										
Stock	Total ACL 2012	35% Rollover of 2012 Total ACL	30% Rollover of 2012 Total ACL	25% Rollover of 2012 Total ACL	20% Rollover of 2012 Total ACL	15% Rollover of 2012 Total ACL	10% Rollover of 2012 Total ACL	Total U.S. ABC 2013	Total ACL 2013	% Change in ACL: 2012 to 2013
GB cod	4,861	**1,701**	**1,458**	**1,215**	**972**	**729**	**486**	2,002	1,907	**-61%**
GOM cod	6,700	**2,345**	**2,010**	**1,675**	**1,340**	**1,005**	**670**	1,550	1,470	**-78%**
GB Haddock	29,260	**10,241**	**8,778**	**7,315**	**5,852**	**4,389**	**2,926**	29,335	27,936	**-5%**
GOM Haddock	958	**335**	**287**	**240**	**192**	**144**	**96**	290	274	**-71%**
GB Yellowtail Flounder	547.8	**192**	**164**	**137**	**110**	**82**	**55**	215	208.5	**-62%**
SNE Yellowtail Flounder	936	**328**	**281**	**234**	**187**	**140**	**94**	700	665	**-29%**
CC/GOM Yellowtail Flounder	1,104	**386**	**331**	**276**	**221**	**166**	**110**	548	523	**-53%**
Plaice	3,459	**1,211**	**1,038**	**865**	**692**	**519**	**346**	1,557	1,482	**-57%**
Witch Flounder	1,563	**547**	**469**	**391**	**313**	**234**	**156**	783	751	**-52%**
GB Winter Flounder	3,575	**1,251**	**1,073**	**894**	**715**	**536**	**358**	3,750	3,641	**2%**
GOM Winter Flounder	1,040	**364**	**312**	**260**	**208**	**156**	**104**	1,078	1,040	**0%**
SNE/MA Winter Flounder	603	**211**	**181**	**151**	**121**	**90**	**60**	1,676	1,612	**167%**
Redfish	8,786	**3,075**	**2,636**	**2,197**	**1,757**	**1,318**	**879**	10,995	10,462	**19%**
White Hake	3,465	**1,213**	**1,040**	**866**	**693**	**520**	**347**	4,177	3,974	**15%**
Pollock	14,736	**5,158**	**4,421**	**3,684**	**2,947**	**2,210**	**1,474**	15,600	14,921	**1%**
Northern Windowpane	163	**57**	**49**	**41**	**33**	**24**	**16**	151	144	**-12%**
Southern Windowpane	381	**133**	**114**	**95**	**76**	**57**	**38**	548	527	**38%**
Ocean Pout	240	**84**	**72**	**60**	**48**	**36**	**24**	235	220	**-8%**
Halibut	83	**29**	**25**	**21**	**17**	**12**	**8**	99	96	**16%**
Wolffish	77	**27**	**23**	**19**	**15**	**12**	**8**	70	65	**-15%**

7.0 Environmental Consequences – Analysis of Impacts

7.1.1 Biological Impacts

Biological impacts discussed below focus on expected changes in fishing mortality for regulated multispecies stocks. Changes in fishing mortality may result in changes in stock size. Impacts on essential fish habitat and endangered or threatened species are discussed in separate sections. Impacts are discussed in relation to impacts on regulated multispecies and other species. The impacts associated with the measures are anticipated to be minor and not significant.

Throughout this section, impacts are often evaluated using an analytic technique that projects future stock size based on a recent age-based assessment. These projections are known to capture only part of the uncertainties that are associated with the assessments projections. There is evidence that in the case of multispecies stocks the projections tend to be optimistic when they extend beyond a short-term period (1-3 years). This means that the projections tend to over-estimate future stock sizes and under-estimate future fishing mortality. Attempts to find a way to make the projections more accurate have so far proven unsuccessful. These factors should be considered when reviewing impacts that use this tool.

7.1.1.1 Updates to Status Determination Criteria, Formal Rebuilding Programs and Annual Catch Limits

7.1.1.2 Revised Status Determination Criteria

7.1.1.2.1 Option 1: No Action

Impacts on regulated groundfish

The No Action alternative would maintain the status determination criteria (SDC) for GB yellowtail flounder as adopted in Amendment 16. These values were based on the GARM III assessments completed in 2008. Since new benchmark assessments will have been completed for GB yellowtail flounder before this action is implemented, and as part of those assessments new SDCs were determined, the use of GARM III values would conflict with M-S Act requirements to use the best available science.

It is difficult to directly compare the Amendment 16 SDCs with updated biomass target values and the maximum fishing mortality threshold to determine the impacts if the older values are retained because of differences between assessments. During the 2014 GB yellowtail flounder assessment, the TRAC agreed to no longer use the VPA assessment model, and instead, to use an empirical approach based on resource survey catches as the basis of catch advice. Because a stock assessment model framework is lacking for this stock, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. As well, status determination relative to reference points is not possible because reference points cannot be defined. Therefore, the biomass target of B_{MSY}, minimum biomass threshold, and maximum fishing mortality threshold for GB yellowtail flounder would not be defined by either Option 1/No Action or Option 2.

Impacts on other species

Adopting this option would not be expected to have direct impacts on non-groundfish species such as monkfish, dogfish, skates, and sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished.

GB yellowtail flounder is allocated to the scallop fishery. Maximum fishing mortality threshold would not be defined by Option 1/No Action or Option 2. How this might impact scallops is unclear and there are a number of other factors that influence scallop fishing activity (such as access area openings, trip limits, DAS allocations, etc.).

7.1.1.2.2 Option 2: Revised Status Determination Criteria

Impacts on regulated groundfish

Adoption of Option 2 would change the status determination criteria (SDC) for GB yellowtail flounder would be the criteria developed at the most recent benchmark assessments and would be based on the best available science, consistent with the M-S Act.

It is difficult to directly compare the Amendment 16 SDCs with updated biomass target values and the maximum fishing mortality threshold to determine the impacts if the older values are retained because of differences between assessments. During the 2014 GB yellowtail flounder assessment, the TRAC agreed to no longer use the VPA assessment model, and instead, to use an empirical approach based on resource survey catches as the basis of catch advice. Because a stock assessment model framework is lacking for this stock, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. As well, status determination relative to reference points is not possible because reference points cannot be defined. Therefore, the biomass target of B_{MSY}, minimum biomass threshold, and maximum fishing mortality threshold for GB yellowtail flounder would not be defined by either Option 1/No Action or Option 2.

Impacts on other species

Adopting this option would not be expected to have direct impacts on non-groundfish species such as monkfish, dogfish, skates, and sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or if the stock is overfished.

GB yellowtail flounder is allocated to the scallop fishery. Maximum fishing mortality threshold would not be defined by Option 1/No Action or Option 2. How this might impact scallops is unclear and there are a number of other factors that influence scallop fishing activity (such as access area openings, trip limits, DAS allocations, etc.).

7.1.1.3 Annual Catch Limits

7.1.1.3.1 Option 1: No Action

Impacts on regulated groundfish

A number of groundfish stocks do not have FY 2015 specifications defined in previous actions. This option would not set specifications for these stocks in FY 2015; stocks with FY 2015 specifications from previous actions would be maintained and are not discussed further. The distribution of Annual Catch Limits (ACLs) to other fishery sub-components would be maintained.

An Overfishing Level (OFL), Acceptable Biological Catch (ABC) or ACLs would not be defined for certain stocks in the multispecies fishery. Without specification of an ACL, a catch would not be allocated to the groundfish fishery (sectors or common pool vessels) and targeted groundfish fishing activity would not occur for these stocks. Catches would not be eliminated because there would probably be incidental catches or bycatch from other fisheries. The lack of an OFL makes it difficult to determine whether overfishing is likely to occur, however, with limited fishing activity the probability of overfishing would be low. Accountability Measures (AMs) would be maintained but are expected to have a low probability of being triggered without allocations.

In addition to the lack of targeted groundfish fishing activity on stocks without an ACL, certain provisions of the sector management system make it likely that fishing activity could be constrained even for stocks with an ACL that is specified. Current management measures require that a sector stop fishing in a stock area if it does not have ACE for a stock. Fishing can continue on stocks for which the sector continues to have ACE only if the sector can demonstrate it will not catch the ACE-limited stock. In practice, this mean is that in most cases there will be little opportunity for sector vessels to fish on stocks that already have an ACL under this option because of this requirement. Since there would be no allocations for GB yellowtail flounder, GB winter flounder, GOM winter flounder, and pollock from FY2015-FY2017, most groundfish fishing activity would not occur. As a result, in general this option would be expected to result in dramatically lower fishing mortality and more rapid stock rebuilding than would be the case for Option 2.

For stocks that have an age-based assessment, an age-based projection model was used to estimate the short-term impacts on stock size of setting the ABCs. These models project the estimated median stock sizes expected to result by limiting catches to the ABC. Recent experience suggests that the projections tend to be biased high, predicting stocks sizes that are larger than realized and fishing mortality rates that are higher than expected (Groundfish Plan Development Team, pers. comm.). The effect of no groundfish allocations was explored in stock projections for the following stocks:

- Gulf of Maine Cod
- Gulf of Maine Haddock
- Georges Bank Yellowtail Flounder
- Georges Bank Winter Flounder
- Pollock

Since there may be catches of these stocks in other fisheries the projections used an estimate of other sub-components catches to approximate the catches that might occur (Table 64).

Table 64 - Estimated catches that might occur in FY2015-FY2017 under Option 1/No Action. "No Action Assumed Catch" used in the stock projections.

Stock	Non-Groundfish Assumed Catch (mt)		
	2015	2016	2017
GOM Cod	154	38	38
GOM Haddock	19	55	66
GB Winter Flounder	60	67	69
Pollock	2,158	2,158	2,158

Notes on the "Non-Groundfish Assumed Catch"

Since there may be catches of these stocks in other fisheries the No Action/Option 1 SSB projections used an estimate of other sub-components catches to approximate the catches that might occur.

"Non-Groundfish" includes the other sub-component, state waters sub-component, scallops, small-mesh sub-ACL, and mid-water trawl sub-ACL as in Table 8 (of the draft alternatives, Option 2) for FY 2015, FY2016 and FY 2017.

However for FY 2015, GOM cod and GOM haddock have specifications under the No Action/Option 1 and these were used to approximate non-groundfish catches based on Table 5 (of the draft alternatives).

GOM Cod
Under Option 1, Gulf of Maine cod projections indicate an increase in SSB occurs but it remains well below SSB_{MSY} (Figure 21, Figure 22, and Figure 23). For Option 1, three scenarios were run dependent on the natural mortality assumption, base (m=0.2) and ramp (m=0.2 and m-0.4); each show an increase in SSB after 2015 but it remains well below SSB_{MSY} (Figure 21, Figure 22, and Figure 23). Option 1 does not differ greatly from the projections from Option 2. SSB increases are projected to be greater under Option 1 than Option 2.

GOM Haddock
Under Option 1, Gulf of Maine haddock projections indicate a further increase in SSB above the SSB_{MSY} under this scenario (Figure 24). The stock is above the SSB_{MSY} and is expected to increase during the projected years under Option 1. Option 1 would allow for greater increases in SSB than Option 2.

GB Winter Flounder
Under Option 1, Georges Bank winter flounder biomass projections indicate that SSB will increase after 2015 and there is some indication that the stock may increase above the SSB_{MSY} biomass (Figure 25). Option 1 would allow for greater increases in SSB than Option 2.

Pollock
Under Option 1, pollock SSB projections indicate a further increase in SSB above the SSB_{MSY} (Figure 26). The SSB also increases under Option 2 but it is lower than in Option 1.

It is not possible to project stock sizes for the following stocks:

- GB Yellowtail Flounder
- GOM Winter Flounder

For index-assessed stocks an estimate of the probability of overfishing cannot be determined but the proposed ABC is based on the default control rule applied to the most recent estimate of stock size. As a result, if stock size does not decline then the proposed ABC would not be expected to result in overfishing. This is an unrealistic assumption – stock size could increase or decrease but is unlikely to remain constant.

Figure 21- Projected GOM cod stock size under Option 1/No Action, using M=0.2 model

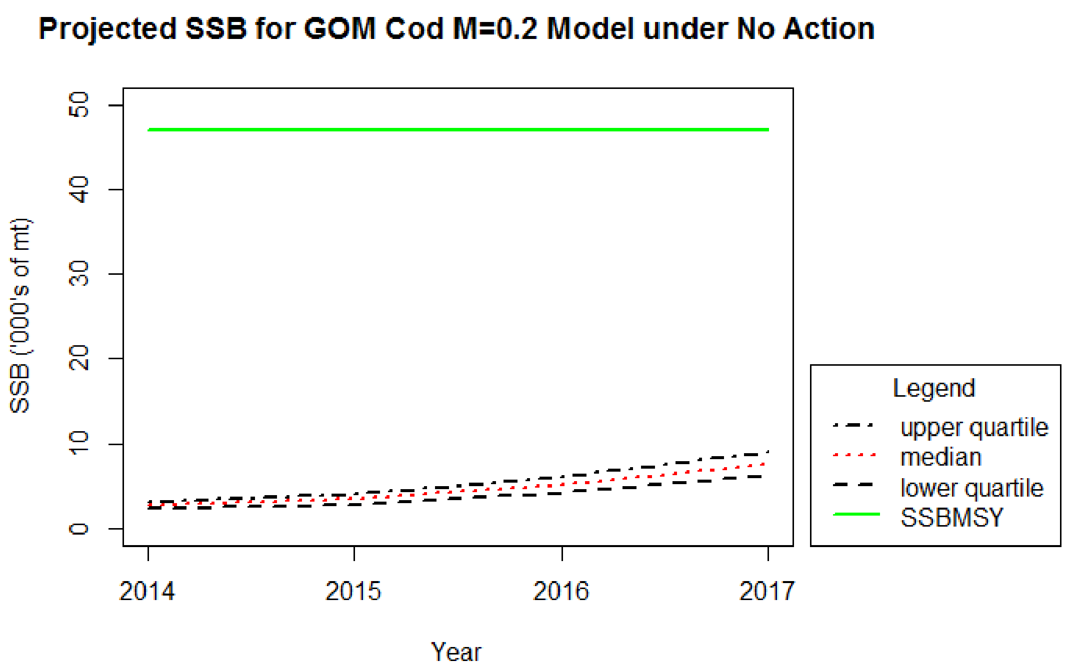


Figure 22- Projected GOM cod stock size under Option 1/No Action, using M-ramp/M=0.2 model.

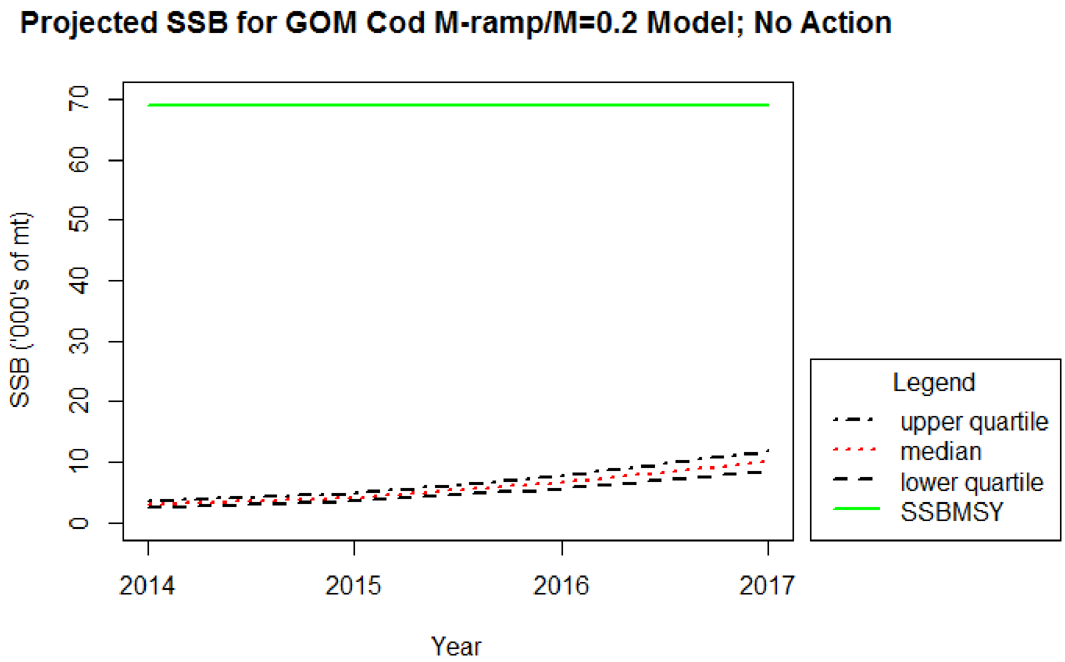


Figure 23- Projected GOM cod stock size under Option 1/No Action, using M-ramp/M=0.4.

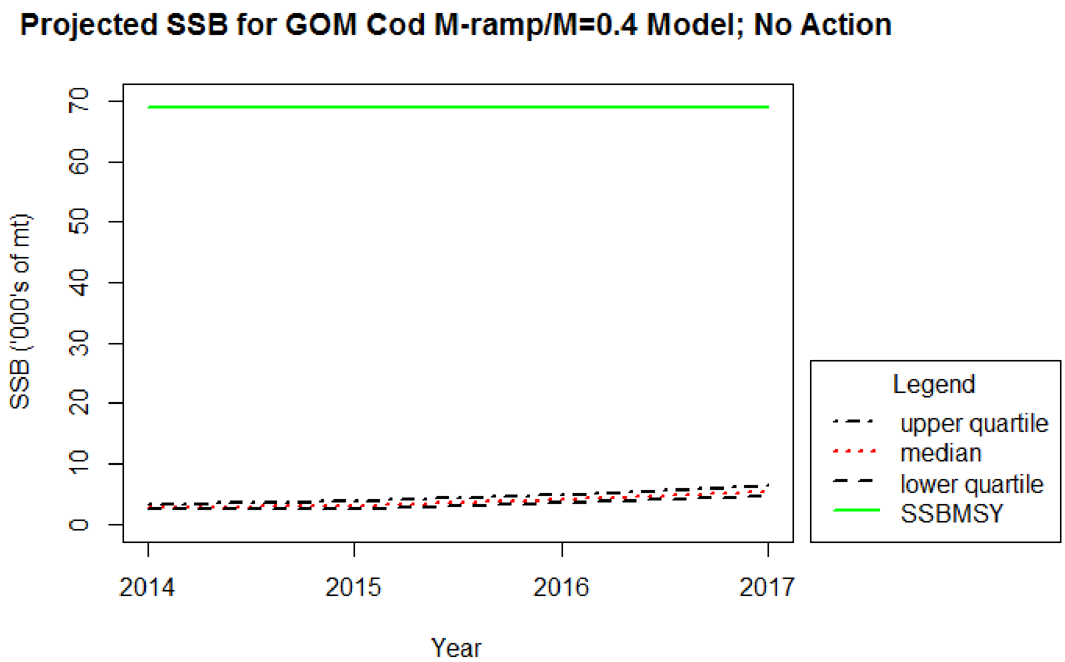


Figure 24- Projected GOM haddock stock size under Option 1/No Action.

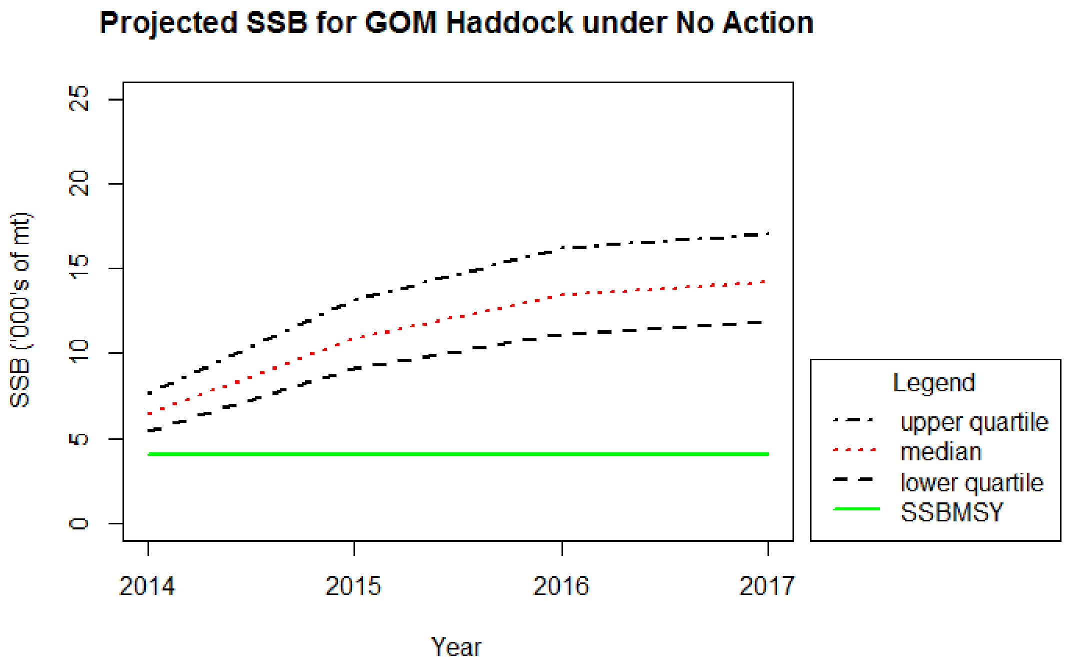


Figure 25- Projected GB winter flounder stock size under Option 1/No Action.

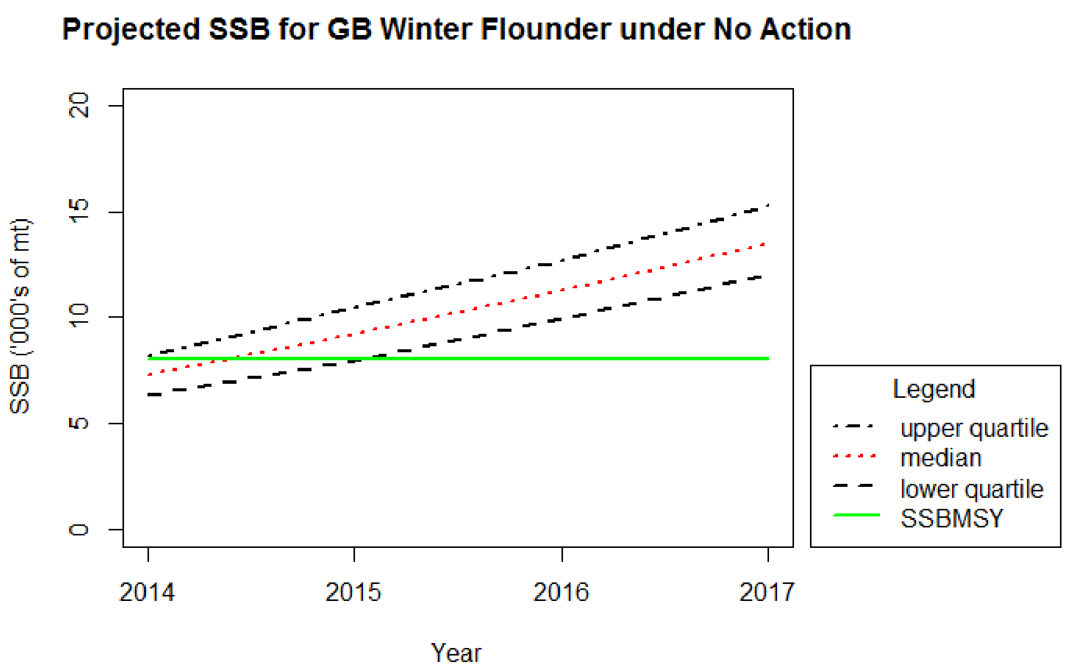
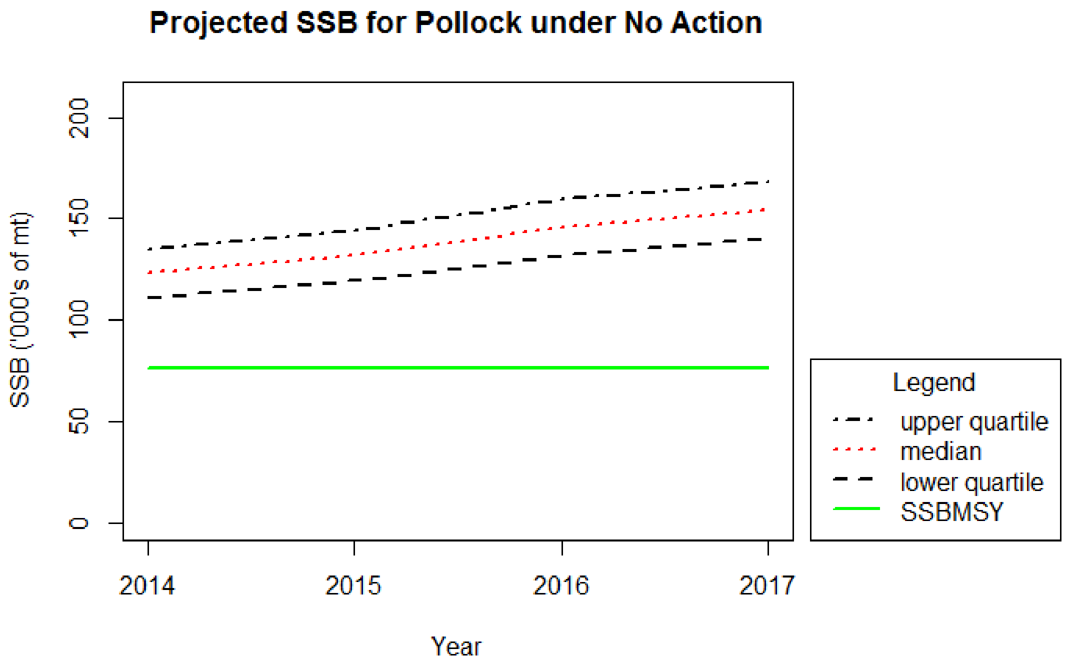


Figure 26- Projected pollock stock size under Option 1/No Action.



Impacts on other species

Adopting the Option 1/No Action specifications is not expected to have direct impacts on non-groundfish species. Indirect effects are generally likely to be beneficial given the expected reduced groundfish fishing activity. Catches of other species that occur on groundfish trips would decline as a result. There are only limited opportunities for groundfish vessels to target other stocks in other fisheries, so the shifting of effort into other fisheries is not likely to occur on a large scale. These other fisheries will also have ACLs and AMs so while such effort shifts may have economic effects the biological impacts should not be negative. Considering the differences between the ACLs of Option 1/No Action and Option 2, the fishing mortality on other stocks would probably be lower under Option 1/No Action.

7.1.1.3.2 Option 2: Revised Annual Catch Limit Specifications

Impacts on regulated groundfish

Option 2 would adopt new ABCs consistent with the best available science for GOM cod, GOM haddock, GB yellowtail flounder, GB winter flounder, GOM winter flounder, and pollock. The ABCs for other stocks were set in previous actions and not discussed here. Generally, increases in SSB are lower under Option 2 than those under Option 1/No Action.

Because this option would adopt FY 2015 - 2017 ABCs for the stocks listed above, and all the stocks have recent assessment updates or benchmark assessments, short-term projections can be used to estimate the probability of overfishing and short-term changes in stock size. These projections use catches equal to the ABCs that would be adopted if this option is selected. Since the management goal is to keep catches at or below ACLs, and ACLs are always less than the ABC, the projection results would be expected to slightly over-estimate the risk of overfishing and under-estimate future stock size.

Projected stock sizes are shown in Figure 27 through Figure 32 for these stocks and the probability of overfishing is listed in Table 65. This table compares projected future stock size to both 2016 and 2017. A comparison of probability of overfishing between the two options is difficult as Option 1/No Action has no OFLs defined for some stocks.

GOM Cod

The recent update assessment for GOM cod indicates that the stock is well below SSB_{MSY}. Under Option 2, the projections indicate an increase in SSB after 2015. Under Option 2, the SSB is projected to increase marginally after 2015 but the SSB_{MSY} is still well above the projected SSB size. For Option 2, three scenarios were run dependent on the natural mortality assumption, base (m=0.2) and ramp (m=0.2 and m-0.4); each show an increase in SSB after 2015 but it remains well below SSB_{MSY} (Figure 27, Figure 28, and Figure 29). Option 1 does not differ greatly from the projections from Option 2. SSB increases are projected to be greater under Option 1 than Option 2.

GOM Haddock

GOM haddock SSB projections indicate a further increase in SSB above the SSB_{MSY} under this scenario (Figure 30). The stock is above the SSB_{MSY} and is expected to increase during the projected years under Option 1. The SSB also increases under Option 2 but it is lower than in Option 1.

GB Winter Flounder

GB winter flounder projections indicate that SSB will increase after 2015 and there is some indication that the stock may increase above the SSB_{MSY} (Figure 31). The SSB also increases under Option 2 but it is lower than in Option 1.

Pollock

Pollock SSB projections indicate a further increase in SSB above the SSB_{MSY} under this scenario (Figure 32).The stock is above the SSB_{MSY} and is expected to increase during the projected years under Option 1. The SSB also increases under Option 2 but it is lower than in Option 1.

Figure 27- Projected GOM cod stock size under Option 2, using M=0.2 model

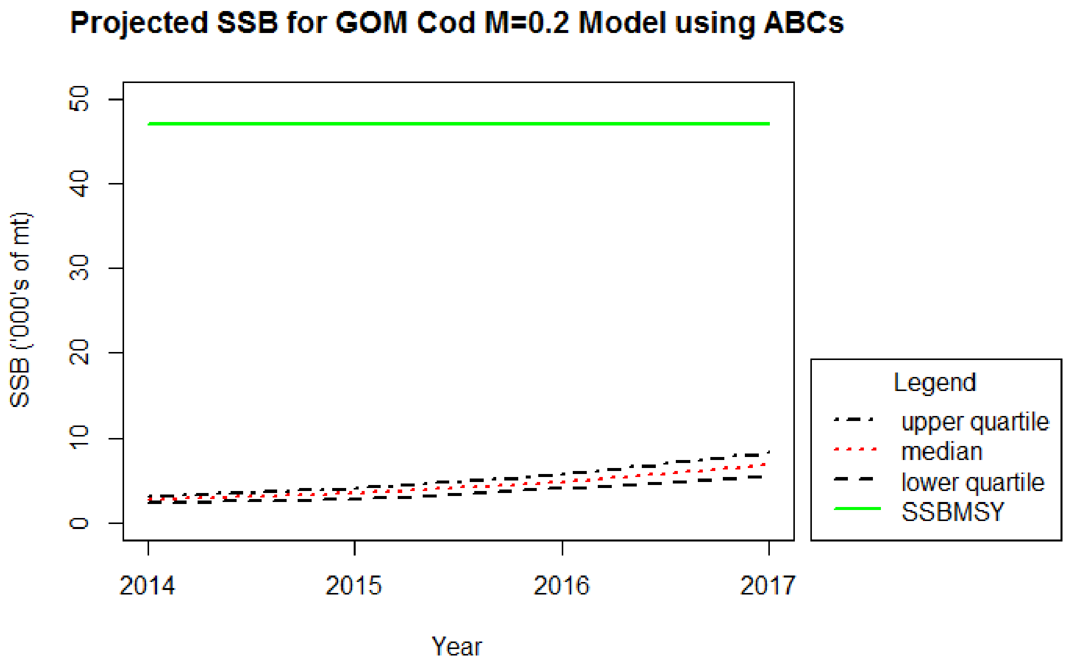


Figure 28- Projected GOM cod stock size under Option 2, using M-ramp/M=0.2 model.

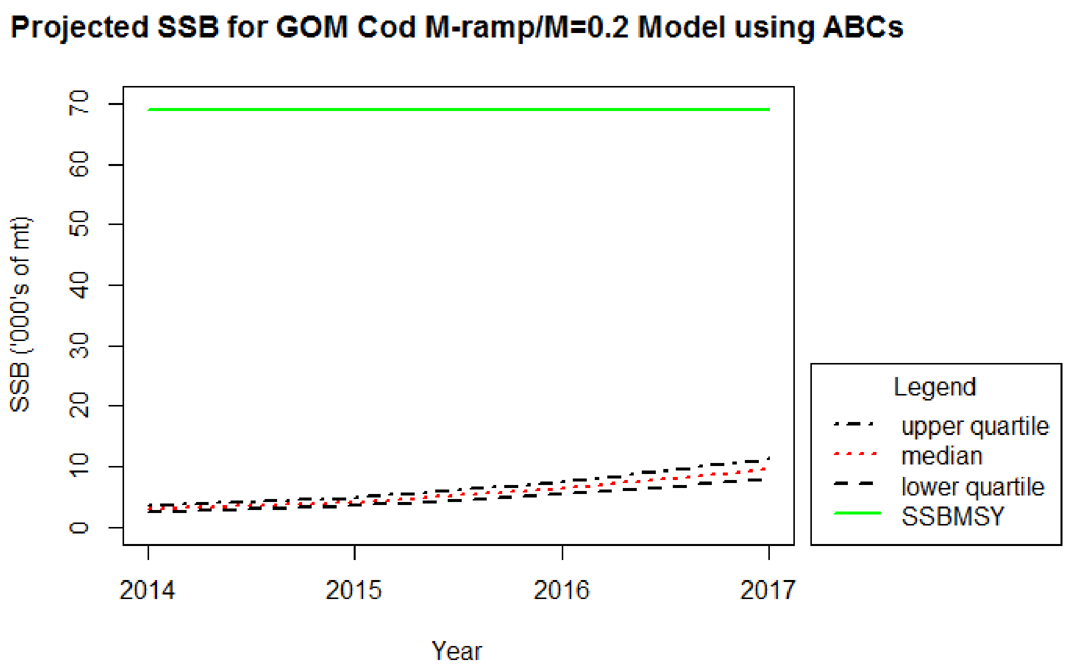


Figure 29- Projected GOM cod stock size under Option 2, using M-ramp/M=0.4.

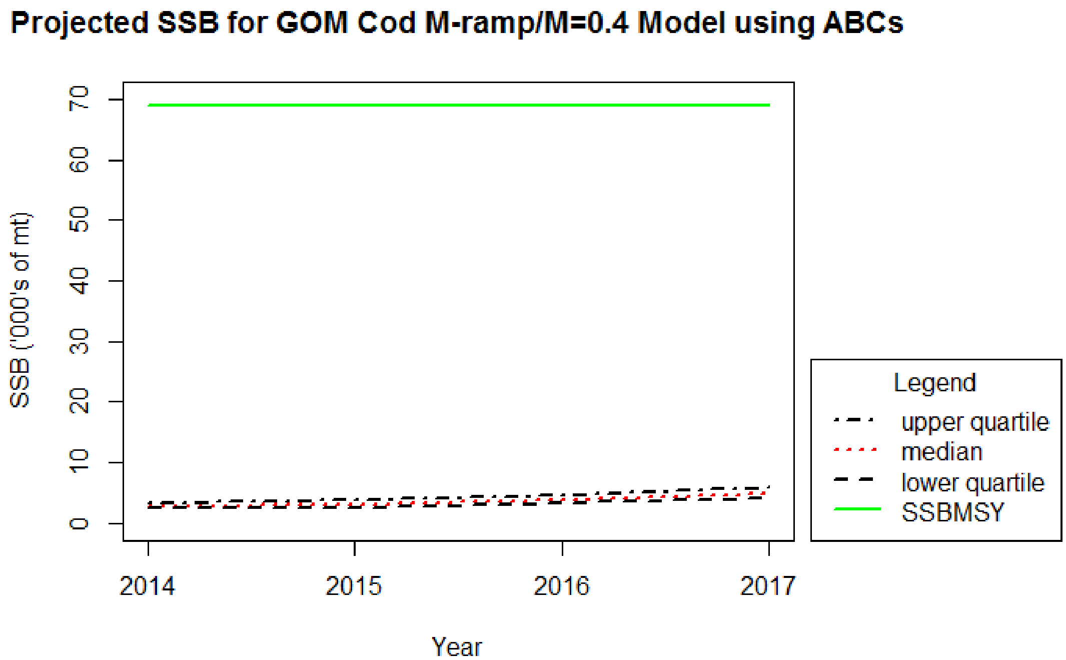


Figure 30- Projected GOM haddock stock size under Option 2.

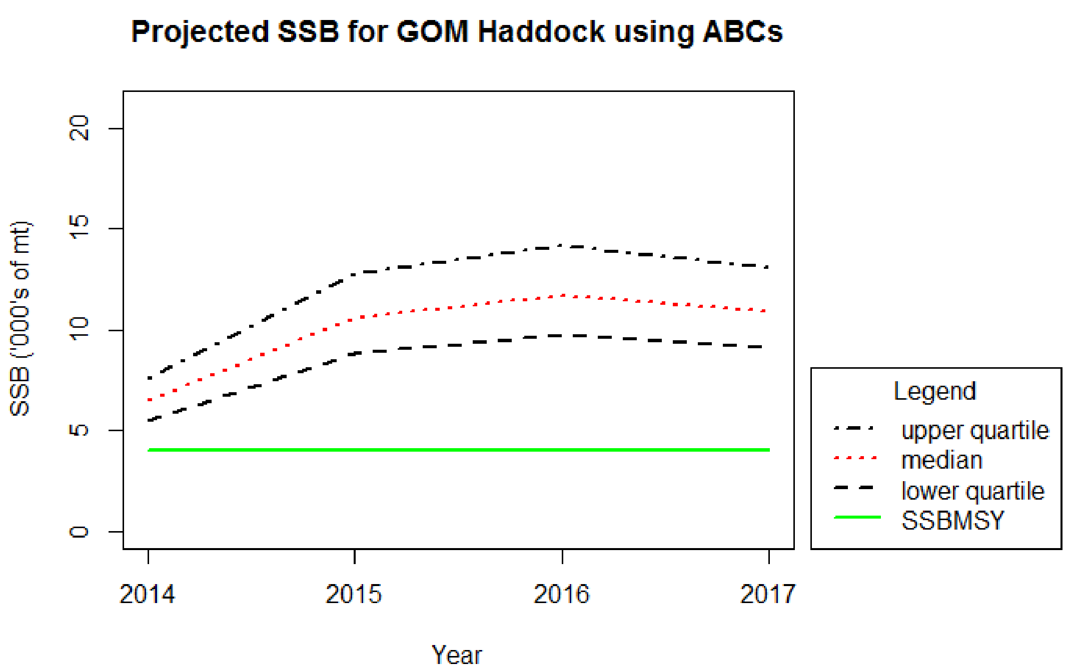


Figure 31- Projected GB winter flounder stock size under Option 2.

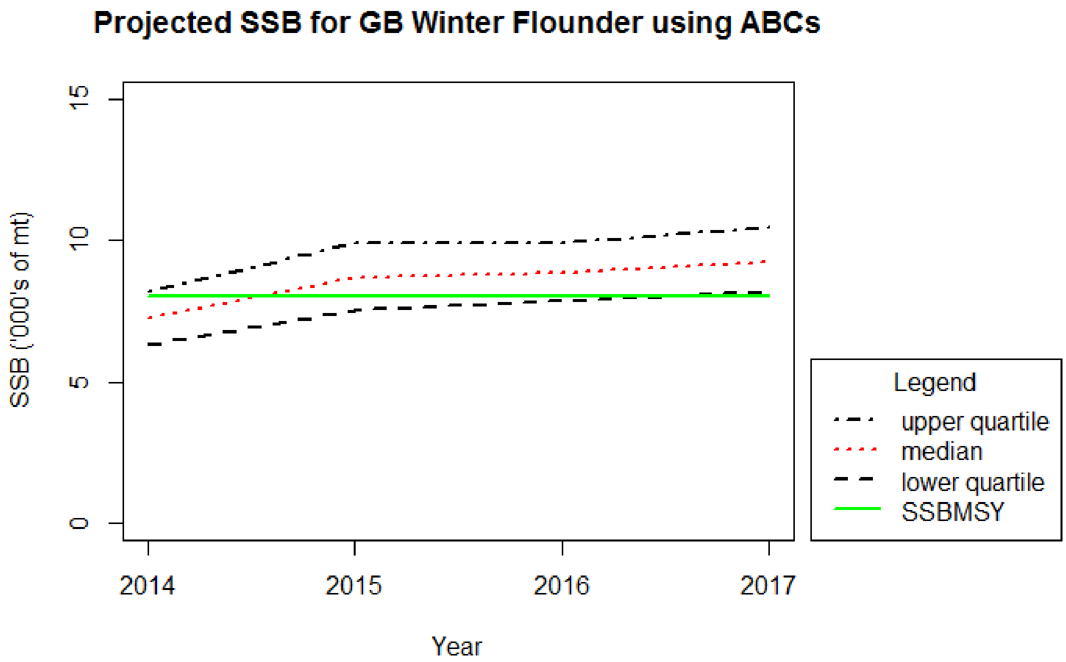


Figure 32- Projected pollock stock size under Option 2.

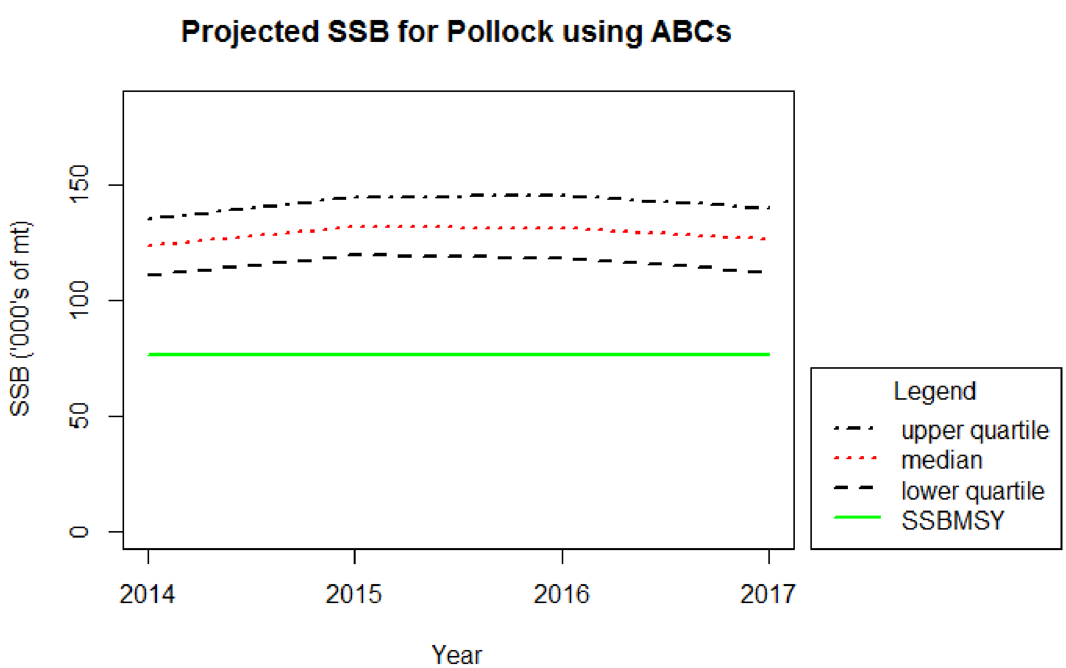


Table 65- Estimated probability of overfishing if catch is equal to ABC.

Species	Stock	Probability of Overfishing 2015	2016	2017
Cod (m=0.2 model)	GOM	0.18	0.02	0.00
Cod (mramp m=0.2)	GOM	0.06	0.00	0.00
Cod (mramp m=0.4)	GOM	0.33	0.13	0.02
Haddock	GOM	0.18	0.20	0.25
Yellowtail Flounder	GB	*NE*	*NE*	*NE*
Winter Flounder	GB	0.02	0.03	0.04
Winter Flounder	GOM	*NE*	*NE*	*NE*
Pollock		0.04	0.040	0.02

NE = Not Estimated

Impacts on other species

In general, the specification of groundfish ABCs and ACLs by this option would not be expected to have direct impacts on most other species. Other species are caught on groundfish fishing trips and the ABCs/ACLs could indirectly affect species if they result in changes in groundfish fishing activity. When compared to Option 1/No Action, this option would be expected to result in more groundfish fishing effort and as a result catches of other species would be expected to be higher. This would be expected to result in higher fishing mortality rates for those species when compared to the No Action alternative. Species such as monkfish, skates, and spiny dogfish are among those most likely to be affected. All of these species are subject to management controls, and it is not likely that fishing mortality will exceed targets. Indeed, when compared to recent years, the reduction in groundfish ABCs/ACLs as proposed in this action would be expected to result in reduced catches of other species.

An additional species that could be affected by this option would be Atlantic sea scallops. The ABCs and ACLs that are proposed include specification of sub-ACLs of GB yellowtail flounder and northern windowpane flounder. These sub-ACLs are designed to limit the incidental catch of yellowtail flounder and northern windowpane flounder by the scallop fishery, and exceeding the allocations results in triggering AMs in subsequent years. The sub-ACLs can affect fishing mortality and stock size of sea scallops through this mechanism.

The northern windowpane flounder scallop sub-ACL in this option is based on a proposed decision to allocate a fixed percentage of this stock to the fishery. If adopted for FY 2015, this percentage would be based on 2-14% percent of the U.S. ABC. There is a possibility that the fishery may exceed the sub-ACL, which would lead to implementation of an AM in a later year. If the AM restricts scallop fishing in the northern windowpane flounder area, it could shift scallop effort into other areas. The impacts of this AM on the fishing mortality and stock size of scallops are difficult to predict because future scallop management measures have not been defined.

7.1.1.4 SNE/MA (southern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

7.1.1.4.1 Option 1: No Action

~~*Impacts on regulated groundfish*~~

~~Option 1\No Action would maintain the existing distribution of the SNE/MA windowpane ACL to the groundfish fishery, state waters sub-component, and other sub-component. Option 1\No Action represents status quo and would have no direct impacts on groundfish species.~~

~~*Impacts on other species*~~

~~This option would not be expected to have any direct impacts on other species. This option would not be expected to lead to any changes in catches of other species, and would not affect the management of those species.~~

7.1.1.4.2 Option 2: Create SNE/MA Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

~~*Impacts on regulated groundfish*~~

~~Splitting the of SNE/MA windowpane flounder commercial sub-ACL between groundfish sectors and the common-pool would be administrative, and would not, in and of itself, have a direct impact on groundfish resources because this measure as written is not expected to change fishing effort or fishing behavior. Option1\No Action would continue to maintain a single commercial sub-ACL and AM for the SNE/MA windowpane flounder stock, while Option 2 would split the commercial sub-ACL between sectors and the common-pool. The AMs for the commercial groundfish fishery would be the same for Option 1\No Action and Option 2, and continue to account for overages of the overall ACL. Therefore, Option 1\No Action is expected to have the same impact as Option 2 on regulated groundfish.~~

~~*Impacts on other species*~~

~~This option would not be expected to have any direct impacts on other species. This option would not be expected to lead to any changes in catches of other species, and would not affect the management of those species.~~

7.1.1.5 GOM/GB (northern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

7.1.1.5.1 Option 1: No Action

~~*Impacts on regulated groundfish*~~

~~Option 1\No Action would maintain the existing distribution of the GOM/GB windowpane ACL to the groundfish fishery, state waters sub-component, and other sub-component. Option 1\No Action represents status quo and would have no direct impacts on groundfish species.~~

~~*Impacts on other species*~~

~~This option would not be expected to have any direct impacts on other species. This option would not be expected to lead to any changes in catches of other species, and would not affect the management of those species.~~

7.1.1.5.2 Option 2: Create GOM/GB Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

~~*Impacts on regulated groundfish*~~

~~Splitting the of GOM/GB windowpane flounder commercial sub-ACL between groundfish sectors and the common-pool would be administrative, and would not, in and of itself, have a direct impact on groundfish resources because this measure as written is not expected to change fishing effort or fishing behavior. Option 1\No Action alternative would continue to maintain a single commercial sub-ACL and AM for the GOM/GB windowpane flounder stock, while Option 2 would split the commercial sub-ACL between sectors and the common-pool. The AMs for the commercial groundfish fishery would be the same for Option 1\No Action and Option 2, and continue to account for overages of the overall ACL. Therefore, Option 1\No Action is expected to have the same impact as Option 2 on regulated groundfish.~~

~~*Impacts on other species*~~

~~This option would not be expected to have any direct impacts on other species. This option would not be expected to lead to any changes in catches of other species, and would not affect the management of those species.~~

7.1.1.6 GOM/GB Windowpane Flounder Scallop Fishery Sub-ACL

7.1.1.6.1 Option 1: No Action

Impacts on regulated groundfish

This option would not adopt any additional sub-ACLs for GOM/GB windowpane flounder. As a result, the only sub-ACL for this stock would be for the groundfish fishery, and only the groundfish fishery would have an AM. The ACL for this stock was exceeded in FY 2010, FY 2011, FY 2012, and FY 2013, (with the AM implemented in the groundfish fishery in FY 2014 due to FY 2012 and FY 2013 overages) suggesting that controls on other fisheries are needed to effectively constrain catches to the ACL (Table 59 and Table 60). Furthermore, OFL was exceeded in FY 2013 (Table 58). Since 2010, the scallop fishery has made up over 90% of the total other sub-component catches (Table 59). If this option is adopted, it increases the risk that overfishing will occur for a longer period since the AM is unlikely to modify catches enough to end overfishing. This is because measures taken to control catches by the groundfish fishery can only affect part of the catch. This is true when comparing Option 1/No Action to Option 2.

Impacts on other species

This option is unlikely to have direct impacts on any other species. When compared to the adoption of Option 2, it could result in higher mortality on other stocks because other fisheries would not be subject to AMs if the ACL is exceeded. But all of those fisheries have their own measures in place that are designed to prevent overfishing, so this is unlikely and any differences are not likely to be measureable.

7.1.1.6.2 Option 2: Create a Scallop Fishery GOM/GB Windowpane Flounder Sub-ACL

Impacts on regulated groundfish

If this option is adopted, a sub-ACL of GOM/GB windowpane flounder would be allocated to the scallop fishery. As a result, the scallop FMP would be modified in a future action to adopt AMs for this stock. The biological effects of this measures are actually due to the adoption of an AM, and not the administrative allocation of a portion of the ACL to the scallop fishery. Once the scallop fishery AM would be adopted, this measure would increase the amount of catch of this stock that is directly subject to an AM. In FY 2010, FY 2011, FY 2012, and FY 2013, the catches by the scallop fishery and the groundfish fishery totaled at least 99 percent of the catch (Table 59 and Table 60). By adopting an ACL for the scallop fishery, nearly all of the catches of this stock will be subject to AMs; when compared to Option 1 No Action, it is less likely that overfishing will occur.

Impacts on other species

Option 2, if adopted, and if the AMs are triggered, may result in reduced fishing mortality for non-groundfish species that are caught on groundfish and scallop fishing trips. This is because the AMs may reduce fishing activity in areas where this stock is caught. Mortality of these stocks under this measure would be expected to be lower than Option 1 No Action. These differences would only occur if the AMs are triggered because an ACL is exceeded. It should be noted that the effects on the scallop and other resource are difficult to predict because they would be influenced by management measures for those fisheries.

7.1.2 **Commercial and Recreational Fishery Measures**

To be provided.

7.2 Essential Fish Habitat Impacts

The Essential Fish Habitat impacts discussions below focus on changes in the amount or location of fishing that might occur as a result of the implementation of the various alternatives. This approach to evaluating adverse effects to EFH is based on two principles: (1) seabed habitat vulnerability to fishing effects varies spatially, due to variations in seabed substrates, energy regimes, living and non-living seabed structural features, etc., between areas and (2) the magnitude of habitat impacts is based on the amount of time that fishing gear spends in contact with the seabed. This seabed area swept (seabed contact time) is grossly related to the amount of time spent fishing, although it will of course vary depending on catch efficiency, gear type used, and other factors.

The area that is potentially affected by the proposed ACLss has been identified to include EFH for species managed under the following Fishery Management Plans: NE Multispecies; Atlantic Sea Scallop; Monkfish; Atlantic Herring; Summer Flounder, Scup and Black Sea Bass; Squid, Atlantic Mackerel, and Butterfish; Spiny Dogfish; Tilefish; Deep-Sea Red Crab; Atlantic Surfclam and Ocean Quahog; Atlantic Bluefish; Northeast Skates; and Atlantic Highly Migratory Species. ~~The Preferred Alternative action makes relatively minor adjustments in the context of the fishery as a whole, and, for the reasons stated above, is not expected to have any adverse impact on EFH. Furthermore, the Preferred Alternatives do not allow for access to the existing habitat closed areas on GB that were implemented in Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP and therefore they continue to minimize the adverse impacts of bottom trawling and dredging on EFH. Overall, there are likely to be only minor differences between the EFH impacts of the preferred alternatives and those of the No Action alternative.~~.

7.2.1 Updates to Status Determination Criteria, Formal Rebuilding Programs and Annual Catch Limits

7.2.1.1 Revised Status Determination Criteria

7.2.1.1.1 Option 1: No Action

Adoption of the No Action alternative would maintain the status determination criteria (SDC) for all groundfish stocks as they currently exist.

From a habitat perspective, the SDC themselves are less important than the catch limits that result from implementing those criteria to generate annual catch limits (ACL). Qualitatively, it is assumed that criteria that are not based on the most recent scientific advice may not result in increases in stock size over the long term. This could lead to reduced CPUE and a resulting increase in seabed area swept, particularly when compared to Option 2. However, many factors interact to produce the amount and location of seabed area swept in a particular fishery, such that the effect of SDC on the amount of habitat impacts is uncertain at best.

7.2.1.1.2 Option 2: Revised Status Determination Criteria

Adoption of Option 2 would update the SDC for GB yellowtail flounder, changing both the biomass target and the minimum biomass threshold values to unknown, consistent with the 2014 TRAC assessment. Previously these values were SSB/R and ½ Btarget. Option 2 also updates the numerical estimates of MSY for GOM cod, GOM haddock, GB winter flounder, and pollock, based on 2014 assessments. No MSY values are specified from GOM winter flounder and GB yellowtail, as the SDC are unknown.

From a habitat perspective, the SDC themselves are less important than the catch limits that result from implementing those criteria to generate annual catch limits (ACL). Qualitatively, it is assumed that revised criteria based on the most recent scientific advice will result in increases in stock size over the long term, which hopefully should lead to increased catch per unit effort (CPUE), and therefore reduce seabed area swept. However, many factors interact to produce the amount and location of seabed area swept in a particular fishery, such that the effect of changing SDC on the amount of habitat impacts is uncertain at best. In this specific case, setting the GB yellowtail SDC to unknown may or may not lead to increased precaution in setting catch limits for the stock, so long-term conservation benefits are difficult to determine.

7.2.1.2 Annual Catch Limits

7.2.1.2.1 Option 1: No Action

Under No Action, stocks with FY 2015 specifications from previous actions would be maintained at that level. However, a number of groundfish stocks do not have FY 2015 specifications defined in previous actions, specifically GOM winter flounder, GB winter flounder, pollock, and GB yellowtail flounder. This option would not set specifications for these stocks in FY 2015. Without specification of an ACL, a catch would not be allocated to the groundfish fishery and targeted groundfish fishing activity would not occur for these stocks. In addition, certain provisions of the sector management system make it likely that fishing activity could be constrained even for stocks with an ACL. Current management measures require that a sector stop fishing in a stock area if it does not have ACE for a stock. Fishing can continue on stocks for which the sector continues to have ACE only if the sector can demonstrate it would not catch the ACE-limited stock. What these provisions mean is that in most cases there would be little opportunity for sector vessels to fish on stocks that have an ACL under no action, most groundfish fishing activity would not occur. As a result, in general this option would be expected to result in dramatically lower fishing mortality and dramatically lower impacts to EFH and benthic habitats as compared to the alternative specifications (Option 2).

Table 65 – Comparison between 2014 and proposed No Action 2015 total ACLs for groundfish stocks. Only those stocks being updated via this framework are listed.

Stock	2014 **total ACL (mt)**	No Action 2015 **total ACL (mt)**
GB cod	1,867	2,387
GOM cod	1,470	1,470
GB haddock	18.312	41,526
GOM haddock	323	412
GB yellowtail flounder	318.1	None specified
GB winter flounder	3,493	None specified
GOM winter flounder	1,040	None specified
Pollock	15,304	None specified

7.2.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Option 2 would adopt new ACLs for GB cod, GOM cod, GB haddock, GOM haddock, GB yellowtail flounder, GB winter flounder, GOM winter flounder, and pollock (total ACLs summarized in Table 66). The ACLs for other stocks were set in previous actions.

The majority of the proposed 2015 ACLs are lower than those allocated in 2014. The exceptions to this are GB haddock, where the ACL is roughly 25% higher, GOM haddock, where the ACL is roughly 325% higher, and pollock, where the ACL is slightly higher. The fishery has not caught the GB haddock and pollock ACLs recently for various reasons, so the ACL changes alone are not likely to result in increased fishing effort and increased impacts to EFH. In FY2013 the GOM haddock sub-ACL was exceeded. ~~indicating the demand for GOM haddock~~. If Option 2 is adopted the GOM haddock ACL would increase, which could potentially increase fishing effort on this stock. However, despite the availability of GOM haddock ACL, the decrease in available GOM cod ACL may reduce opportunity to fish in the GOM stock area, which would also decrease EFH impacts. The lower catch limits for the various other stocks are likely to decrease fishing, and therefore EFH impacts, across the groundfish fishery as a whole in comparison to 2014 levels. However, compared to Option 1/No Action, the alternative specifications below will likely have greater impacts to EFH since many stocks are not allocated under No Action. It is difficult to predict how fishing effort may change in later years of this framework, i.e. fishing years 2016 and 2017, because ACLs for some key stocks (GB cod, haddock, and yellowtail) have not yet been determined. Effort would be expected to be higher than if Option 1/No Action is adopted, but will probably be lower than the status quo.

Table 66 – Comparison of 2014 and Proposed 2015 total ACLs for groundfish stocks. Only those stocks being updated via this framework are listed.

Stock	2014 **total ACL (mt)**	Proposed 2015 **total ACL (mt)**
GB cod	1,867	1,886
GOM cod	1,470	366
GB haddock	18,312	23,204
GOM haddock	323	1,375
GB yellowtail flounder	318.1	240
GB winter flounder	3,493	1,952
GOM winter flounder	1,040	489
Pollock	15,304	15,878

7.2.1.3 SNE/MA (southern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

7.2.1.3.1 Option 1: No Action

Under Option 1, groundfish sectors and the common pool would continue to have the same southern windowpane flounder sub-ACL and AM. There would be no change in the overall quota and AM and would not be expected to affect fishing effort. Option 1 would have negligible impacts on EFH.

7.2.1.3.2 Option 2: **[Placeholder]** Create SNE/MA Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

~~Draft language: If this option is adopted, a sub-ACL of SNE/MA windowpane flounder would be allocated to the common pool based on a specific percentage of the groundfish sub-ACL. This would not be expected to substantially increase or decrease the sub-ACL for either component and therefore would not affect fishing effort. Thus, relative to Option 1/No Action, Option 2 would have similar, i.e. negligible, impacts on EFH.~~

7.2.1.4 GOM/GB (northern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

7.2.1.4.1 Option 1: No Action

Under Option 1, groundfish sectors and the common pool would continue to have the same southern windowpane flounder sub-ACL and AM. There would be no change in the overall quota and AM and would not be expected to affect fishing effort. Option 1 would have negligible impacts on EFH.

7.2.1.4.2 Option 2: **[Placeholder]** Create GOM/GB Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

~~Draft language: If this option is adopted, a sub-ACL of GOM/GB windowpane flounder would be allocated to the common pool based on a specific percentage of the groundfish sub-ACL. This would not be expected to substantially increase or decrease the sub-ACL for either component and therefore would not affect fishing effort. Thus, relative to Option 1/No Action, Option 2 would have similar, i.e. negligible, impacts on EFH.~~

7.2.1.5 GOM/GB Windowpane Flounder Scallop Fishery Sub-ACL

7.2.1.5.1 Option 1: No Action

If this option is adopted, only the multispecies fishery would have a sub-ACL for this stock and the AMs for the multispecies fishery must be sufficient to account for overages of the overall ACL. The lack of an AM for the scallop fishery would not have a direct impact on scallop fishing effort (as compared to Option 2), and it is unclear if effort would be distributed any differently than would be the case if Option 2 would be adopted.

7.2.1.5.2 Option 2: Create a Scallop Fishery GOM/GB Windowpane Flounder Sub-ACL

If this option is adopted, a sub-ACL of GOM/GB windowpane flounder would be allocated to the scallop fishery. The sub-ACL will be based on scallop fishery catches for the period from calendar year 2001 through 2010. The primary expected benefits of this action are biological; specifically, the risk of exceeding the ACL for this stock will be reduced. If the sub-ACL for the scallop fishery is exceeded and the AM is triggered, effort in the scallop fishery could be reduced. This could reduce or redistribute area swept and seabed impacts generated as a result of the scallop fishery operations in the GOM/GB windowpane flounder stock area. Because the AMs have not yet been developed, changes are difficult to predict and to compare to Option 1. In general, a substantial amount of effort in the scallop fishery during 2015 is likely to be concentrated in the Mid-Atlantic, which reduces the likelihood that the sub-ACL would be exceeded during that year.

7.2.2 Commercial and Recreational Fishery Measures

7.2.2.1 GOM Cod Spawning Area Closures

7.2.2.1.1 Option 1: No Action

Under Option 1/No Action, no additional spawning area closures would be implemented. The Gulf of Maine Cod Spawning Protection Area would be maintained.

7.2.2.1.2 Option 2: Additional GOM cod Spawning Protection Measures

Under Option 2, new spawning area closures would be implemented. These closures would be in addition to existing management areas, such as the Gulf of Maine Cod Spawning Protection Area, rolling closures, and year-round closures. The Council may select Sub-Option A or Sub-Option B. Both sub-options would restrict both commercial and recreational groundfishing.

Sub-Option A:

- Year-round in the WGOM Closed Area and;
- Seasonally in the following 30-minute blocks during these months:
    - May: 124, 125, 132, 133, 139, 140
    - June: 132, 133, 139, 140, 147
    - November – January: 124-125
    - March-April: 124, 125, 132, 133

Sub-Option A would expand fairly significantly upon existing time/area restrictions on commercial groundfish fishing. Specifically, for sector vessels, which comprise the bulk of groundfishing effort, blocks 124 and 125 would be closed in May, blocks 132 and 133 would be closed in June, and the above indicated blocks would be closed during the months of November, December, January, and March, when there are currently no rolling closures in effect that apply to sector vessels. The schedule above is similar to existing common pool time/area restrictions, with some increases in time/area closures, including closures during December and January, as well as the closure of blocks 132 and 133 off the northern Massachusetts and New Hampshire coasts during March (these areas are already closed in April). Sub-Option A would also lead to new restrictions on recreational fishing in the areas/times noted above, as these vessels are not currently subject to the WGOM Closed Area or the existing rolling closures.

In sum, Sub-Option A is expected to reduce fishing effort in the inshore areas of the Gulf of Maine between March-June and November-January. Some of this effort could be redistributed further offshore in the Gulf of Maine, or onto Georges Bank, but effort from smaller groundfish vessels that focus their fishing activities inshore are more likely to be reduced than redistributed. These reductions in effort will reduce habitat impacts relative to No Action.

<u>Sub-Option B:</u>

- May: 125, 133
- June: 133
- November – January: 124 with an eastern boundary defined at 70-15, 125
- March-April: 125, 133

Sub-Option B is a smaller set of time/area closures as compared to Sub-Option A, but there are still expanded fishing effort restrictions relative to No Action. Of the times/areas listed above, the only ones currently in effect for sector vessels are block 133 in May and blocks 125 and 133 in April. Common pool vessels would experience additional fishing restrictions in December and January, and in block 133 during March. All of these restrictions would be new restrictions on the recreational fishery.

Similar to Sub-Option A, Sub-Option B is also expected to reduce fishing effort in inshore areas of the Gulf of Maine. Because this sub-option includes only the most inshore blocks, it would be easier for vessels to shift their effort offshore of the indicated blocks, unless prevented from doing so by the existing rolling or year-round closures. These reductions in effort will reduce habitat impacts relative to No Action, although a smaller reduction is expected relative to Sub-Option A.

7.2.2.2 Prohibition on the Possession of GOM cod

7.2.2.2.1 Option 1: No Action

Option 1 would continue to allow possession of GOM cod. Sectors would still be subject to the AM if catch is sufficient to exceed the sub-ACL. Because the fishery would still be quota limited this is not expected to alter fishing effort and would have negligible EFH impacts, unless future specifications increase the GOM cod sub-ACL. Option 1 would have similar negligible EFH impacts when compared to Option 2.

7.2.2.2.2 Option 2: Prohibition on the possession of GOM cod

Option 2 would prohibit possession of GOM cod. Sectors would still be subject to the AM if bycatch is sufficient to exceed the sub-ACL. Because the fishery would still be quota limited this is not expected to alter fishing effort and would have negligible EFH impacts, unless future specifications increase the GOM cod sub-ACL. Option 2 would have similar negligible EFH impacts when compared to Option 1.

7.2.2.3 Observer Requirements in the Gulf of Maine

7.2.2.3.1 Option 1: No Action

There would be no revision to existing regulations. Commercial vessels would be permitted to fish throughout the Gulf of Maine, and in multiple broad stock areas on a given trip, provided they comply with all applicable federal reporting requirements. Option 1 would have negligible EFH impacts as changes in the amount and distribution of fishing effort are not expected.

7.2.2.3.2 Option 2: Revised Observer Requirements on trips in the GOM

Option 2 would prohibit commercial vessels from fishing in the GOM west of 70-15W and any other broad stock area (e.g., BSA2, BSA3, BSA4) on the same trip, unless carrying an observer. If such a trip is planned but an observer is unavailable, vessel would be restricted to fishing solely in BSA1, or in the area east of 70-15W in BSA 1 and other broad stock areas. This measure is likely to have negligible to neutral benefits on EFH, unless fishing effort is reduced in the GOM and/or displaced to GB as a result of this measure.

7.2.2.4 Rollover of Groundfish Specifications

7.2.2.4.1 Option 1: No Action

Option 1 would prohibit the rollover of groundfish specifications if rulemaking was delayed for any reason. Without specification of an ACL, a catch would not be allocated to the groundfish fishery and targeted groundfish fishing activity would not occur for these stocks. This would likely decrease fishing effort during the time before rulemaking was finalized. Because effort is ultimately restricted by the overall quota, fishing effort cannot exceed those levels set by rulemaking. Option 1 would not be expected to negatively impact EFH because overall effort would not change, although depending on how long rulemaking was delayed, it may concentrate fishing effort into a shorter time period.

7.2.2.4.2 Option 2: Percentage Rollover Provisions for Specifications

These Sub-Options would allow for rollover of current fishing year quota into the next fishing year if rulemaking is delayed beyond May 1, provided that the rollovers do not exceed ABC recommendations. The Council may select from sub-options A, B, and C, which correspond to 35%, 20%, or 10% rollover.

For all sub-options (A, B and C), if rulemaking was delayed, current fishing year quota could be rolled over into the following FY. In the absence of rollover, a catch would not be allocated to the groundfish fishery and targeted groundfish fishing activity would not occur for the stocks in question. Rollover would allow limited fishing effort to occur before final rulemaking. Because effort is ultimately restricted by the overall quota, fishing effort cannot exceed those levels set by rulemaking. Therefore when compared to Option 1/No Action, none of the rollover sub-options A, B, or C would be expected to negatively impact EFH because overall effort would not change.

7.2.2.5 Sector ACE Carryover

7.2.2.5.1 Option 1: No Action

No Action allows for up to 10% carryover of unused ACE. Option 1\No Action would likely lead to more fishing effort and more negative impacts on EFH than Option2.

7.2.2.5.2 Option 2: Modification to Sector ACE carryover

Option 2 limits the 10% carryover in cases where the carryover plus the total ACL would exceed ABC for a particular stock. This option will lead to carryover values of 10% or less, which would lead to fishing effort levels that are the same as, or less than, the No Action carryover approach. Thus, Option 2 will likely reduce effort and negative EFH impacts relative to Option 1\No Action.

7.3 Impacts on Endangered and Other Protected Species

The FW 53 alternatives are evaluated for their impacts on species protected under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA), with a focus on species that are either threatened or endangered. Section of 6.4.1 of the Affected Environment Section contains a complete list of protected species that inhabit the areas of operation for the Northeast multispecies fishery (Table 20). This impact analysis considers how the fishery may overlap with protected species in time and space, as well as records of protected species interaction with particular gear types (e.g. gillnet, hook, and mobile gear). In this analysis, the greater the fishing effort, the more possibility that interactions with protected species may occur.

7.3.1 Updates to Status Determination Criteria, Formal Rebuilding Programs and Annual Catch Limits

7.3.1.1 Revised Status Determination Criteria

Updating the status determination criteria (SDC) is an administrative measure, and will not have a direct impact on protected species because it does not, in and of itself, change fishing effort or fishing behavior. Whatever impact indirectly precipitates from changes to SDC or mortality targets will be discussed in the context of other alternatives – including the annual catch limits - that the Council adopts in order to meet mortality targets derived from the new SDC and control rules.

7.3.1.2 Annual Catch Limits

7.3.1.2.1 Option 1: No Action

Under Option 1, the ACLs specified for FY 2015 would be unchanged from those adopted through Framework Adjustment 51. The following stocks would not have ACLs: GB yellowtail flounder, GB winter flounder, GOM winter flounder, and pollock. Pollock is a unit stock – meaning that its stock area includes the GOM, GB, and SNE/MA. There would also be no quotas for the stocks managed under the U.S./Canada Resource Sharing Understanding: EGB cod, EGB haddock and GB yellowtail flounder. In the absence of stock specific specifications, commercial groundfish vessels would be unable to fish in the respective broad stock areas without an allocation. Other fisheries with incidental catch of groundfish would continue to operate in the GOM, GB, and SNE/MA. Effort may increase in other fisheries as commercial groundfish vessels would be unable to conduct a directed groundfish fishery.

Based on the above information, Option 1 would be expected to significantly reduce commercial groundfish fishing effort in the GOM, GB, and SNE/MA, thereby reducing the amount of trawl or gillnet gear in the water. Gillnet and trawl gear pose the greatest risk to serious injury and mortality to protected species. As Option 1 will result in the reduction of these gear types in broadstock waters, the potential for protected species interactions with gillnet or trawl gear and therefore, serious injury or mortality, will be reduced. For these reasons, and based on the fact that the No Action Alternative would still require compliance with protected species take reduction plans (e.g., Atlantic Large Whale Take Reduction Plan (ALWTRP), Harbor Porpoise Take Reduction Plan (HPTRP)) and sea turtle resuscitation guidelines, Option 1 is expected to have positive impacts to protected species.

For the reasons described above, the No Action Alternative is likely to have positive impacts on protected species compared to Option 2. Option 2 will result in allocations to all stocks and therefore, commercial fishing in all broadstock areas. As a result, the positive impacts to protected species that Option 1 would provide would be removed and thus, protected species interactions with commercial fishing gear are more likely to occur under Option 2.

7.3.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Option 2 would adopt new specifications for GOM cod, GOM haddock, GOM winter flounder, GB winter flounder, GB yellowtail flounder, and pollock, based on the most recent scientific data. This measure includes the identification of ACLs, ABCs, and OFLs as required by the M-S Act and as implemented by Amendment 16. It also incorporates adoption of the incidental catch TACs for the special management programs that use Category B DAS. Implementation of ACLs is required by the Magnuson-Stevens Act and may have protected species impacts that are difficult to define. The protected species impacts of ACL-setting in general are discussed in detail in Amendment 16.

For the US/Canada stocks, the U.S. TAC for GB cod, and GB yellowtail flounder would decrease in Option 2, while the U.S. TAC for GB haddock would increase. This could lead to a shift in effort to the eastern area for EGB haddock, though it is likely that the EGB cod TAC would constrain the full utilization of the EGB haddock quota (e.g. US EGB haddock TAC of 17,760 mt, and US EGB cod TAC of 124 mt). The quantitative consequences of these changes are unknown, although it is unlikely that full EGB haddock quota allocation will be achieved due to the constraints experienced by the EGB cod quota. As a result, fishing effort to its fullest potential will likely not be experienced and therefore, any effort increases are likely minimal in this area.

Option 2 would increase FY 2015 ACLs for GOM haddock and pollock, and decrease FY 2015 ACLs for GOM cod, GOM winter flounder, and GB winter flounder when compared to the specifications in place for those species in FY 2014 (FW51) (see Table 57 in the Affected Environment). The increase in ACLs for GOM haddock and pollock; however, are not expected to cause large changes to fishing behavior, particularly as the ACL for GOM cod would be significantly reduced if Option 2 is selected and therefore, constrain fishing behavior for these stocks. The largest increases in ACLs under Option 2 are for GOM and GB haddock. While the ACLs for these stocks are increasing, the new ACLs would be similar to or less than ACLs the fishery has operated under over the past four fishing years. The ACL for GB haddock has not been caught under sectors and thus, the quota is not a true reflection of fishing behaviors for this stock. That is, higher quota does not necessarily equate to increases in fishing effort. For instance, in FY 2013, when the ACL was roughly 28,000mt, approximately 5,000mt higher than what is proposed, the fishery caught roughly 12% of the GB haddock quota and therefore, did not fish at its full potential. As a result, quota increases to the ACL do not necessary equate to increases fishing effort and therefore, Option 2 is likely to have a negligible to low negative impact on protected species.

Based on the above information, it is anticipated that Option 2 would result in minimal, if any effort shifts. Any effort increases would occur in areas that are already subject to fishing by bottom trawls and gillnets in the Gulf of Maine, Georges Bank, and Southern New England and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected resources (i.e., ESA listed species and non-ESA listed species; see Section 6.4.1, Table 20). In regards to non-ESA listed species, which consist of species of cetaceans and pinnipeds (marine mammals), although impacts to these species from Option 2 are somewhat uncertain, as quantitative analysis has not been performed; we have considered, to the best of our ability, available information on marine mammal interactions with commercial fisheries, of which, the multispecies is a component (Waring *et al*. 2014). Aside from harbor porpoise and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself over the last 5 years (Waring *et al*. 2014). Specifically, aside from harbor porpoise and several stocks of bottlenose dolphin, potential biological removal (PBR) has not been exceeded for any of the non-ESA listed marine mammal species identified in

Table 20, section 6.4 (Waring *et al*. 2014). Although harbor porpoise and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR, take reduction plans have been implemented to reduce bycatch in the fisheries affecting these species (Harbor Porpoise Take Reduction Plan (HPTRP), effective January 1, 1999 (63 FR 71041); Bottlenose Dolphin Take Reduction Plan (BDTRP), effective April 26, 2006 (71 FR 24776)). These plans are still in place and are continuing to assist in decreasing bycatch levels for these species. Although the information presented is a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and does not address the effects of the multispecies fisheries specifically, the information does demonstrate that changes in allocations in the multispecies, or any other fisheries, whether higher or lower, has not resulted in a collective level of take that threatens the continued existence of non-ESA listed marine mammal populations. Based on this information, and the fact that the multispecies fisheries must comply with specific take reduction plans (i.e., HPTRP, the BDTRP, ALWTRP); that there is continual monitoring of non-ESA listed marine mammal species bycatch; and that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Team), it is not expected that the proposed specifications under Option 2 to result in levels of take that would affect the continued existence of non- ESA listed species of marine mammals. For these reasons, Alternative 2 would have negligible to low negative impacts on non- ESA listed species of marine mammals.

Although the impacts to ESA listed species from Option 2 are somewhat uncertain, as quantitative analysis has not been performed, we have considered, to the best of our ability, how the fishery has operated in regards to listed species since 2010, when NMFS issued a biological opinion on the multispecies fishery (NMFS 2010). The biological opinion issued on October 29, 2010, included an incidental take statement authorizing the take of specific numbers of ESA listed species of sea turtles. Until December 16, 2013, when NMFS issued a new biological opinion on the operation of seven commercial fisheries, including the multispecies fishery, the multispecies fishery has been covered by the incidental take statement authorized and issued with the 2010 Opinion. It should be noted that the 2010 biological opinion did not authorize the incidental take of ESA listed Atlantic salmon as there were no records of interactions between salmon and the groundfish fishery. However, even without an incidental take statement, observers are required to report all ESA species observed to be caught and no observed interactions were reported until 2013 (These interactions were considered and included in the 2013 batch biological opinion cited below). In addition, as Atlantic sturgeon were not listed at the time the 2010 biological opinion was written, this species was not considered in the opinion; however, since this species listing in 2012 (77 FR 5880 and 77 FR 5914, February 6, 2012), it has been included in the most biological opinion issued by NMFS on December 16, 2013 .

The 2010 biological opinion concluded that the fishery may affect, but would not jeopardize the continued existence of any ESA listed species of sea turtles or whales. Since 2010, the allocations for all stocks in the multispecies fisheries have increased, decreased, or remained stable. The allocations being proposed in Option 2 for the specified stocks are no greater than or are within the range of the allocations that have been authorized by the fishery over the last 6 years (since 2010). Collectively, the proposed allocations, combined with the other allocations for this fishery, did not, and have not, resulted in the exceedance of NMFS authorized take of any ESA listed species from 2010 to the present (NMFS 2010; NMFS 2013). In addition, since 2010, the multispecies fishery has not resulted in any exceedance of authorized listed species takes and to date, still has not resulted in the exceedance of authorized take. As a result, the proposed specifications are not expected to result in the multispecies fishery introducing any new risks or additional takes to ESA listed species that have not already been considered and authorized by NMFS to date (NMFS 2010; NMFS 2013) and therefore, the proposed specifications under Alternative 2 are not expected to result in levels of take that would jeopardize the continued existence of ESA listed species. For these reasons, and due to the fact that this alternative would not provide any new, additional, access to year-round closed areas, and would still require compliance with the ALWTRP and sea turtle resuscitation guidelines, Alternative 2 would likely have negligible to low negative impacts on protected resources.

Compared to the No Action alternative (Option 1), which would have a very low potential to adversely affect protected species because of a zero groundfish ACL for these stocks, this alternative could result in incidental take of protected species and therefore, adversely affect the protected species present in the areas in which groundfish ACLs will be set. As a result, compared to Option 1, Option 2 will afford no positive impacts to protected species.

7.3.1.3 SNE/MA (southern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

~~Splitting the of SNE/MA windowpane flounder commercial sub-ACL between groundfish sectors and the common-pool would be administrative, and would not, in and of itself, have a direct impact on protected resources because this measure as written is not expected change fishing effort or fishing behavior. The No Action alternative would continue to maintain a single commercial sub-ACL and AM for the SNE/MA windowpane flounder stock, while Option 2 would split the commercial sub-ACL between sectors and the common-pool. The AMs for the commercial groundfish fishery would be the same for Option 1 and Option 2, and continue to account for overages of the overall ACL. Therefore, Option 1 is expected to have the same impact as Option 2 on protected species.~~

7.3.1.4 GOM/GB (northern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

~~Splitting the of GOM/GB windowpane flounder commercial sub-ACL between groundfish sectors and the common-pool would be administrative, and would not, in and of itself, have a direct impact on protected resources because this measure as written is not expected change fishing effort or fishing behavior. The No Action alternative would continue to maintain a single commercial sub-ACL and AM for the GOM/GB windowpane flounder stock, while Option 2 would split the commercial sub-ACL between sectors and the common-pool. The AMs for the commercial groundfish fishery would be the same for Option 1 and Option 2, and continue to account for overages of the overall ACL. Therefore, Option 1 is expected to have the same impact as Option 2 on protected species.~~

7.3.1.5 GOM/GB Windowpane Flounder Scallop Fishery Sub-ACL

7.3.1.5.1 Option 1: No Action

Option 1 would maintain the existing distribution of the GOM/GB windowpane ACL to the groundfish fishery, state waters sub-component, and other sub-component. The No Action represents status quo and would have negligible impacts on protected species. The lack of an AM for the scallop fishery allows for fishing activity to continue after an overage. Some benefit for protected species may be expected if this additional AM would result in appropriate alterations in fishing activity; without a scallop fishery AM, fishing activity is only impacted by the overall groundfish AM, which restricts certain types of trawl gear in an area on Georges Bank, may provide some benefit for protected species.

7.3.1.5.2 Option 2: Create a Scallop Fishery GOM/GB Windowpane Flounder Sub-ACL

Option 2 would create a GOM/GB windowpane flounder sub-ACL for the scallop fishery. It would reduce the allocation to the other sub-components category and establish a sub-ACL for the scallop fishery with AMs adopted in a future scallop management action during 2015. This alternative is expected to reduce the likelihood of exceeding the groundfish sub-ACL and triggering an AM for the groundfish fishery. The likelihood of an AM being triggered in the scallop fishery is unknown.. The sub-ACL will be based on 2% - 14% of the scallop fishery catches. The impacts on protected species depend on which AM is triggered as an AM can result in a shift in effort to another area. The major concern would be if effort shifts in ways that were not expected when scallop fishing measures are developed. These impacts could be either positive or negative.

7.3.2 Commercial and Recreational Fishery Measures

7.3.2.1 GOM Cod Spawning Area Closures

7.3.2.1.1 Option 1: No Action

The No Action would maintain an existing GOM cod spawning closure area (Whaleback) implemented in Framework Adjustment 45. It is reasonable to expect that this area would continue to result in low positive to neutral impacts to protected as it likely limits potential interaction with gear (i.e., trawl and gillnet) in the fishery during the designated timeframes of the closure (i.e., June-June 30:Commercial vessels; April-June: recreational vessels). Specifically, use of gear capable of catching groundfish (e.g., trawl and gillnet) is prohibited in this area during the closure. Gillnet and trawl gear are known to pose the greatest risk to serious injury or mortality to protected species and therefore, restricting the use of these gear types during the designated closure may reduce harm and mortality to protected species that occur in the Ipswich Bay area of GOM from April to June. In addition, the No Action Alternative would still require compliance with protected species take reduction plans (e.g., Large Whale Take Reduction Plan, Harbor Porpoise Take Reduction Plan) and sea turtle resuscitation guidelines. Although the No Action Alternative is likely to provide some positive impacts to protected species, as the No Action area closure is shorter in duration and encompasses a smaller area than the areas proposed in Sub-Options A and B, this Alternative would likely have less of a positive impact on protected resources than either option. As a result, the No Action Alternative is likely to have low positive to negligible impacts to protected species.

7.3.2.1.2 Option 2: Additional GOM cod Spawning Protection Measures

Under this option, commercial and recreational vessels fishing would be prohibited from fishing in areas of the Western GOM, during several months of the year in order to protect aggregations of spawning cod.

<u>Sub-Option A:</u>

Sub-Option A would create discreet GOM cod closure areas in May, June, November through January, and March through April. The May spawning closure restricts commercial and recreational fishing in areas of the Western Gulf of Maine (WGOM). This spawning area overlaps with the WGOM closed area, and includes all of Ipswich Bay, and Massachusetts Bay, including Stellwagen Bank National Marine Sanctuary. The April spawning area covers the northern portion of the WGOM, and overlaps with the WGOM closed area. The November through January closure restricts fishing from Massachusetts Bay east to Stellwagen Bank, and the southern extent of the WGOM closed area. The March to April spawning closure area would prohibit fishing in Ipswich Bay, Massachusetts Bay, including Stellwagen Bank, and overlaps with the western GOM closed area. Sub-Option A coincides with the occurrence and distribution of large and small cetaceans, hard shell sea turtles, pinnipeds, and Atlantic sturgeon in the GOM. The closure areas covers critical habitat areas, foraging grounds, and wintering areas for the endangered North Atlantic Right Whale during times of know occurrence. Sub-Option A also closes areas during times when other marine mammal (large and small cetacean, pinnipeds), sea turtle, Atlantic sturgeon, and salmon species are known to occur. This option also closes areas of the GOM to gillnets and trawl gear when they are distributed in the GOM, and in Harbor Porpoise Management Areas where takes have been documented. Sub-Option A would positively impact protected species.

It is expected that effort shifts may occur as result of Sub-Option A's seasonal closures. The shifts; however, will be confined to areas that are already subject to fishing by bottom trawls and gillnets in the Gulf of Maine and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species and that are thus, currently regulated to minimize interactions with protected species (i.e., Harbor Porpoise, HPTRP; large whales, ALWTRP) or have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014). In addition, the seasonal closures will eliminate protected species interactions in those areas that are closed in the GOM at particular times of year. Shifts in fishing effort from the GOM to other areas of the multispecies fishery (e.g., GOM to GB), as well as well as changes in fishing behavior in other components of the multispecies fishery are also not expected as a result of Option 2, Sub-Option A and therefore, increases interactions with protected species in these areas is also not expected.

The commercial fisheries in the GOM are primarily prosecuted with various trawl gear types and gillnets. Of these, gillnets have a higher impact potential on specific protected species in the GOM area, as outlined in Section 6.1.6. It is possible that the shift of gillnet effort could increase potential interactions; however, the majority of the closures are inshore of the WGOM area. Based NEFOP and ASM observed marine mammal (non-listed) gillnet takes from 2007-2012, a substantial amount of gillnet interactions with marine mammal species west of the Western Gulf of Maine (WGOM) Closure Area have been observed, suggesting that the area along the WGOM Closure area is heavily concentrated with gillnet gear and therefore, poses an interaction risk to not only non-listed marine mammal species, but also listed species. Because Sub-Option A would close many inshore areas seasonally, it is expected that the number of takes in gillnets may be reduced resulting in positive impacts for protected species. In addition, as Sub-Option A is expected to disperse gillnets from this area in many months of the year (See seasonal closure areas; Figure 2), as well as moderately reduce the amount of groundfish specific gillnet gear used in the GOM, the risk of listed species interacting with gillnet gear may decrease in the affected area as gillnet gear will not only be more diffuse, but also reduced in number.

Interaction with trawl gear is more variable as seen in the observed takes distribution of trawl gear. Interactions in trawl gear have not been observed in the GOM for any ESA listed species. Non-ESA listed marine mammal species have been observed incidentally taken in this area by trawl gear; however, there has been no indication that takes of non-ESA listed species of marine mammals in commercial trawl fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself (Waring *et al*. 2014)**.** As time and area closures will be in place in areas where trawl interactions with protected species have been observed, Sub-Option A may reduce the number of potential trawl interactions with protected species in these areas, and therefore, result in positive impacts to protected species. Because the overall effort will be constrained by the Framework Adjustment 53 catch limits and likely reduced by the combination of trip limits and area closures, Sub-Option A is not expected to result in elevated levels of take that are beyond those previously assessed by NMFS (Waring et al. 2014; NMFS 2013). As a result, Sub-Option A is expected to have positive to negligible impacts on endangered and protected species with respect to overall trawl gear interactions.

Overall when compared to the No Action option, Sub-Option A may positively affect protected species by limiting potential interaction with gear in the fishery(i.e., trawl and gillnet) via designated time/area closures. Specifically, use of gear capable of catching groundfish (e.g., trawl and gillner) is prohibited in these areas during the closure. Gillnet and trawl gear are known to pose the greatest risk to serious injury or mortality to protected species and therefore, restricting the use of these gear types during the designated closures may reduce harm and mortality to protected species such as large and small cetaceans, and hand shell sea turtles, which are more abundant in the spring and summer, or harbor and gray seals, which are year-round residents.

Sub-Option A is likely to provide more protection from gear interactions than Sub-Option B because Sub-Option B closes a smaller overall area than Sub-Option A during the same months. Therefore, Sub-Option A would have a greater positive impact on protected resources when compared to Sub-Option B.

Sub-Option B:

Sub-Option B would create discreet GOM cod closure areas in May, June, November through January, and March through April. The May spawning closure is smaller than the Option A May closure, and restricts commercial and recreational fishing in Massachusetts Bay and Ipswich Bay. The April spawning closure area covers a portion of the inshore GOM, including Ipswich Bay, and overlaps with the existing GOM cod spawning closure area. The November through January closure restricts fishing in Massachusetts Bay, and on Stellwagen Bank. The March to April spawning closure area covers the same inshore area as the May closure. Sub-Option B coincides with the occurrence and distribution of large and small cetaceans, hard shell sea turtles, pinnipeds, and Atlantic sturgeon in the GOM. The closure areas covers critical habitat areas and wintering areas for the endangered North Atlantic Right Whale during times of know occurrence. Sub-Option B also closes areas during times when other marine mammal (large and small cetacean, pinnipeds), sea turtle, Atlantic sturgeon, and salmon species are known to occur. This option also closes areas of the GOM to gillnets and trawl gear when they are distributed in the GOM. Sub-Option A would like positively impact protected species.

As described in the analysis for Sub-Option A, protected species have been observed taken in gillnet and trawl gear in the areas west of the WGOM Closure area. Any time or area closures in these areas will potentially reduce protected species interactions with fishing gear (e.g., trawl and gillnet) and therefore, result in positive impacts to protected species. However, because Sub-Option B does not close Block 132 and 139, where a large number of protected species (e.g., non-listed marine mammals) have been observed taken in gillnet, and to some extent, trawl gear, and only closes Block 124 from November to January, Sub-option B is likely to provide less protection to protected species from gear interactions than Sub-Option A. Sub-Option B; however, will still provide time and area closures in 133, 125, and 124, where some protected species have been observed taken and therefore, Sub-Option B is likely to have a low positive to negligible impact on protected species.

As noted above, compared to Sub-Option A, Sub-Option B is expected to have less of a positive impact on protected species than Sub-Option A due to the smaller overall area closed under Sub-Option A, and therefore, a smaller overall area where protection from gear interactions would be provided. As a result, compared to Sub-Option A, Sub-Option B may have a low negative to impact on protected species.

When compared to the No Action/Option 1, Sub-Option B may positively affect protected species by providing limiting potential interactions with gear in the fishery, which could reduce harm and mortality to protected species such as large cetaceans and sea turtles, which are more abundant in the summer or harbor and gray seals, which are year-round residents. Both sub-options could be expected to positively impact protected species compared to the No Action alternative.

7.3.2.2 Prohibition on the Possession of GOM cod

7.3.2.2.1 Option 1: No Action

No Action. There would be no revision to the retention regulations of GOM cod. This would require sector vessels to retain and land all legal sized cod, and common-pool and recreational fishermen to retain and land all legal sized cod up to a trip or bag limit, respectively. Each component of the fishery would continue to operate under strict catch limits and AMs. Option 1 is not expected to change behavior in the fishery, in and of itself, and therefore is expected to have a neutral impact on protected species.

7.3.2.2.2 Option 2: Prohibition on the possession of GOM cod

This option would prohibit possession of GOM cod by all commercial and recreational vessels (i.e. all vessels would be required to discard all GOM cod). Option 2 retains allocations of GOM cod for the groundfish fishery, and fishing effort is expected to be a function of the allocated ACL. In theory, this measure would not allow fishing effort to increase because commercial and recreational fisheries would continue to operate under strict catch limits and AMs. While landings and possession would be prohibited, all catch, in theory, would be accounted for. Any shift in effort would occur in areas that are already subject to fishing by bottom trawls and gillnets in the Gulf of Maine and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species and that are thus, currently regulated to minimize interactions with protected species (i.e., Harbor Porpoise, HPTRP; large whales, ALWTRP) or have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014).. For the reasons stated above, Option 2 is expected to have a neutral impact on protected species. When compared to the No Action, Option 2 is also expected to have a neutral impact on protected species.

7.3.2.3 Observer Requirements in the Gulf of Maine

7.3.2.3.1 Option 1: No Action

The No Action alternative would make no changes to regulations, and reporting requirements that are currently in place for all limited access groundfish vessels.

7.3.2.3.2 Option 2: Revised Observer Requirements on trips in the GOM

The Option 2 would prohibit all limited access groundfish vessels that conduct fishing activity west of 70 15 W longitude in the GOM broad stock reporting area (BSA 1) from fishing in multiple broad stock reporting areas with the intent of improving accountability of catches of GOM cod. Option 2 would add an additional VMS reporting requirement and would prohibit vessels that fish to the west of 70 15 W longitude from fishing in multiple broad stock reporting areas.

To the extent that there will be additional reporting requirements for vessel's conducting fishing activity without at-sea observers on board, there may be improved information regarding the interaction of such fisheries with protected species. Based on the above information, it is anticipated that Option 2 would result in minimal, if any effort shifts. Any effort increases would occur in areas that are already subject to fishing by bottom trawls and gillnets in the Gulf of Maine and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species and that are thus, currently regulated to minimize interactions with protected species (i.e., Harbor Porpoise, HPTRP; large whales, ALWTRP) or have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014). For the reasons stated above, Option 2 is expected to have a neutral impact on protected species.

7.3.2.4 Rollover of Groundfish Specifications

7.3.2.4.1 Option 1: No Action

In the absence of specifications for a stock due to a delay in rulemaking, fishing would not be allowed in the broad stock area for that stock. There are currently no provisions within the Northeast Multispecies FMP that allow for specifications to be rolled forward into the next fishing year to enable fishing to begin of time at the start of the fishing year (e.g. from FY 2014 to FY 2015). In the event of a delay in rulemaking, the No Action would decrease fishing effort in all broad stock reporting areas (GOM, GB, SNE) at the start of the fishing year, and would have a positive impact on protected resources.

7.3.2.4.2 Option 2: Percentage Rollover Provisions for Specifications

Option 2 would allow the FY to begin on time in the event of a delay in rulemaking by rolling forward specification values from one fishing year into the next (e.g. from FY 2014 to FY 2015). Sub-options A, B, and C would roll forward a percentage of the prior year's stock specific ACL up to a value that may not exceed the stock's acceptable biological catch (ABC) for the upcoming fishing year. The default rollover ACL would be replaced by new, updated specifications upon rulemaking. This is an administrative measure that, in and of itself, is not expected to impact fishing effort or behavior over the course of an entire fishing year. However, varying percentages would allow varying levels of fishing effort in the event of a major delay in rulemaking.

Sub-Option A: Rollover 35% of all groundfish stocks to the following FY.

Sub-Option A is less conservative than Sub-Options B and C. These default rollover measures would have may have slightly negative impact on protected resources when compared to Sub-Options B and C because this option would allow the fishery to catch up to 35% of the prior year's ACL before new specifications are adopted. Sub-Option A would have a slightly negative impact on protected species when compared to the No Action.

Sub-Option B: Rollover 20% of all groundfish stocks to the following FY.

Sub-Option B is the more conservative than Sub-Option A, but less conservative than Sub-Option C. These default rollover measures would have may have slightly positive impacts on protected resources when compared to Sub-Options A, and a slightly negative impact when compared to Sub-Option C because this would allow the fishery to catch up to 20% of the prior year's ACL before new specifications are adopted. Sub-Option B would have a slightly negative impact on protected species when compared to the No Action.

Sub-Option C: Rollover 10% of all groundfish stocks to the following FY.

Sub-Option C is the most conservative of the default rollover measures under consideration, and would have may have slightly positive impacts on protected resources when compared to Sub-Options A or B because this would only allow the fishery to catch up to 10% of the prior year's ACL before new specifications are adopted. Sub-Option C would have a slightly negative impact on protected species when compared to the No Action.

7.3.2.5 Sector ACE Carryover

7.3.2.5.1 Option 1: No Action

The No Action alternative would continue to allow groundfish sectors to carry over up to 10% of their unused sector ACE, as outline in Amendment 16. This is an administrative alternative and is not expected to have an impact protected species.

7.3.2.5.2 Option 2: Modification to Sector ACE carryover

Option 2 would modify Sector carryover provisions in Amendment 16. Carryover effectively increases the total amount of allocation a sector can catch in the following fishing year.

Option 2 would allow groundfish sectors to carry forward up to 10% of unused ACE provided that the total unused sector ACE carried forward for all sectors from the previous FY does not exceed the ABC level minus the ACL for the fishing year in which the carryover would be landed. This provision keeps catches within the prescribed acceptable biological catch, and in and of itself, is not expected to change fishing effort or behavior. This is an administrative alternative and is not expected to have an impact protected species.

7.4 Economic Impacts

To be provided.

7.5 Social Impacts

National Standard 8 (NS8) requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen will be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

A fundamental difficulty exists in forecasting social change relative to management alternatives, since communities or other societal groups are constantly evolving in response to external factors (e.g., market conditions, technology, alternate uses of waterfront, and tourism). Certainly, management regulations influence the direction and magnitude of economic and social change, but attribution is difficult with the tools and data available. While the focus here is on the economic and social impacts of the proposed fishing regulations, external factors may also influence change, both positive and negative, in the affected communities. External factors may also lead to unanticipated consequences of a regulation, due to cumulative impacts. These factors contribute to a community's ability to adapt to new regulations.

When examining potential social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); groundfish dealers and processors; final users of groundfish; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. While some management measures may have a short-term negative impact on some communities, these should be weighed against potential long-term benefits to all communities which can be derived from a sustainable groundfish fishery.

The social impact factors outlined below can be used to describe the Northeast multispecies fishery, its sociocultural and community context and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007) and other texts (e.g., Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. While this analysis does not quantify the impacts of the management alternatives relative to the social impact factors, qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts.

The social impact factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.
2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The effects of the proposed action on *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities, as well as effects on the community's social structure, politics, etc.
4. The *Non-Economic Social Aspects* of the proposed action; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007).

7.5.1 Updates to Status Determination Criteria, Formal Rebuilding Programs and Annual Catch Limits

7.5.1.1 Revised Status Determination Criteria

Option 1: No Action
Under No Action, there would be no revisions to the status determination criteria of groundfish stocks, and numerical estimates would not change (Table 2 and Table 3).

Adoption of the No Action alternative would mean the status determination criteria (SDC) for GB yellowtail flounder would not change. If the No Action alternative is selected, the primary effect would be to maintain the biomass targets established based on outdated assessments for the stocks in question. Since new assessments have been completed for these stocks, the use of the old values would not constitute the best available science. There could be negative impacts on the *Attitudes, Beliefs and Values* of stakeholders if management is based upon outdated science. Thus, the social impacts of Option 1 are low negative.

Option 2: Revised Status Determination Criteria
Under Option 2, the status determination criteria for GB yellowtail flounder, was revised to reflect the best scientific information. Although their SDCs do not change, updated numerical estimates of criteria are provided for GOM cod, GOM haddock, GOM winter flounder, GB winter flounder, and pollock based on the outcomes of updated peer reviewed assessments in 2014 (Table 4 and Table 5).

Option 2 adopts the SDC recommended by the most recent assessments for GB yellowtail flounder. Compared to the No Action alternative, the most substantial effect of this alternative would be to change the status determination for GB yellowtail flounder to be unknown. This could have small negative social impacts on the *Attitudes, Beliefs and Values* of stakeholders, because the assessment process was unable to approve an assessment model for this stock. However, given concerns regarding the VPA assessment model previously used for GB yellowtail, the decision to no longer use this model could have positive impacts on the *Attitudes, Beliefs and Values* of stakeholders regarding the flexibility of management. Using the most recent stock assessment information could have positive impacts on the *Attitudes, Beliefs and Values* of stakeholders. Thus, the social impacts of Option 2 are low positive relative to No Action.

7.5.1.2 Annual Catch Limits

7.5.1.2.1 Option 1: No Action

Under No Action, groundfish fishery ACLs for FY 2015 would be unchanged from those adopted through Framework Adjustment 51 (Table 6; Table 58). The following stocks would not have ACLs specified: GB yellowtail flounder, GB winter flounder, GOM winter flounder, and pollock. There would also be no quotas for the stocks managed under the U.S./Canada Resource Sharing Understanding: EGB cod, EGB haddock and EGB yellowtail flounder. With the exception of white hake in FY2016, all other groundfish stocks would not have ACLs for FY 2016 and FY 2017. Commercial groundfish vessels may not fish in the broad stock area of any stock that does not have an ACL specified. Through existing authority, NMFS would likely prohibit recreational catch of GOM cod and GOM haddock if no ABC/ACL were specified for those stocks (in FY 2016 and FY 2017). Non-groundfish fisheries could continue to be able fish however (e.g., scallop, herring, small-mesh multispecies, etc.).

If Option 1 is selected, it would have substantial negative social impacts, particularly in terms of the *Size and Demographic Characteristics* of the fishery-related workforce and the *Historical Dependence on and Participation in* the fishery. Since several critical stocks will have no ACL specified, commercial groundfish fishing would not be permitted for sector or common pool vessels for the species with undefined ACLs, nor would fishing be allowed in these species' broad stock areas. Because pollock is a unit stock, no directed groundfish trips would occur. It is likely that overall gross revenues for the groundfish fishery would be very low (see Section 7.4, Economic Impacts). This would have a negative impact on the individuals and communities involved with the commercial groundfish fishery, particularly those who target these stocks or catch these stocks in conjunction with others. Under such circumstances, extreme industry consolidation would be expected, leading to the loss of many groundfish fishing jobs and a reduction in household income for fishing families. Shore-side infrastructure, including service and gear providers, as well as wholesalers, could become unprofitable due to the reduced business and may be forced to shut down, further impacting the social fabric of fishing communities. For those fishermen that remain in the fishery, there may be an incentive to adopt risky behavior such as deferring boat maintenance and replacement in an attempt to make ends meet (Lord 2011). Other impacts to the *Non-Economic Social Aspects* of the fishery could include reduced job satisfaction caused by the restrictions on catches and uncertainty about the future. Option 1, however, could have some positive long-term social impacts if stock rebuilding targets were reached more quickly due to decreased effort.

Commercial landings of groundfish stocks are important to many ports throughout the Northeast U.S. The Georges Banks stocks are particularly important to the ports of Portland, Gloucester, New Bedford, and Point Judith. Because multiple groundfish species are caught in conjunction with others, and the extensive range of the pollock stock unit, having no ACL for pollock would likely result in a shutdown of the entire groundfish fishery. This would cause severe negative social impacts for the commercial fishery.

Selecting Option 1 could also cause distrust in management, because having no ACLs and no quota for U.S./Canada Resource Sharing stocks could be seen as a failure on the part of management to use best available science and a timely specifications process. This could have a negative impact on the formation of *Attitudes, Beliefs, and Values* of fishermen and other stakeholders.

If Option 1 changes the *Historical Dependence on and Participation in* the fishery (e.g. prevents industry segments from fishing), perceived inequities could cause resentment or conflict between fishing groups, a negative social impact in the form of changes to *Social Structures and Organizations*. The impacts of Option 1 would be less negative for the recreational fishery, as there is no recreational fishery in the eastern GB stock area and no recreational sub-ACL for the stocks that would have a zero sub-ACL in FY 2015. Selecting Option 1 could lead to perceived inequities between the commercial versus recreational and other fishery components (e.g., scallops), if the commercial fishery cannot continue fishing while others can.

With such a severe limitation on fishing opportunity, many fishermen may leave the fishery entirely or at least seek temporary opportunities in another fishery, and the number of vessels and fishermen involved would be reduced. There is already a perception among many fishermen that there is a diminishing return on investment in the groundfish fishery that makes it hard to earn a living from fishing. In a 2010 telephone survey of multispecies permit holders, 62% indicated that, based on their fishing income at the time, they could only remain in business for 1-2 years (Holland et al. 2010). Option 1, would further limit the income potential of many groundfish fishermen, forcing some to leave the fishery.

For the recreational fishery, there would be ACLs for GOM cod and GOM haddock in FY 2015, so the recreational fishery would be able to continue for that year, but it is highly unlikely that recreational fishing would be permitted in FY 2015, and definitely not in FY 2016 and FY 2017. The social impacts on the recreational fishery would be neutral in the near-term, but negative in the long-term. If commercial fishing is prohibited while the recreational fishery can proceed, there could be negative impacts on the *Attitudes, Beliefs, and Values* of commercial fishermen towards management and increased conflicts between stakeholder groups, a negative impact on the *Non-Economic Social Aspects* of the fishery.

Overall, the social impacts of Option 1 would be negative.

7.5.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Under Option 2, there would be annual specifications set for FY 2015 for all stocks, and several stocks would have specifications for FY 2016 and FY 2017 as well (Table 9; Table 58). The total ACLs are the same as Option 1, except for GOM cod (lower), GB haddock (lower), and GOM haddock (higher), as well as the stocks that do not have specifications under Option 1: GB yellowtail flounder, GB winter flounder, GOM winter flounder, and pollock. Option 2 would also adopt specifications for the stocks with U.S./Canada Resource Sharing Understanding quotas. For several stocks, the percent distribution of the total ACL would be adjusted between the groundfish fishery and the state waters and other sub-components.

Impacts relative to No Action
If Option 2 is selected, there would generally be positive social impacts relative to No Action, as all stocks would have specified catch limits, so some amount of fishing could occur in all the Broad Stock Areas. The impacts to the *Size and Demographic Characteristics* and the *Historical Dependence on and Participation in* the fishery would not be as severe as under No Action. The GOM haddock ACL would more than triple under Option 2, however, as this stock is frequently caught in conjunction with GOM cod, the potential social benefits of this increase would be limited by the very low GOM Cod ACL, which would be about 75% lower than under No Action (Table 58).

Option 2 would likely result in more positive impacts on the *Attitudes, Beliefs, and Values* of stakeholders towards management than Option 1, because the fishery would at least be able to operate. Many public comments have been received by the Council expressing frustration with the amount of time it takes to incorporate new science and stock assessments into management measures. The failure to adopt ACLs based on the most recent assessments and analyses would only exacerbate that perception. Acheson (2010) points out that groundfish fishermen in New England have an inherently different view of the ocean and its fisheries than the views held by federal ocean/fisheries scientists, based largely on personal experience and their own proximal environment. This can be at odds with the larger environment described by fisheries scientists. It is, in part, because these differing views cannot always be reconciled that industry opinion of federal fisheries science is so low in New England (Acheson 2010; Acheson & Gardner 2011; Holland, et al. 2010). Furthermore, fishermen tend to identify fishing effort as only one factor affecting the size of stocks, and that it may not be the most important one. Management control of fishing pressure, as in the revised annual catch limit specifications set by Option 2, may not be perceived to be the most effective control of fish stocks size (Acheson & Gardner 2011).

Impacts relative to FY 2014
When compared to the ACLs for FY 2014 (Table 6), ACLs would be unchanged or increased for all stocks with the exception of GOM cod, GB yellowtail flounder, and GB and GOM winter flounder. Due to the large decrease in the GOM cod ACL, and the relative importance of GOM Cod to the groundfish fishery, the social impacts of Option 2 are likely to be negative relative to the FY 2014 fishery. Under

Option 2, there are likely to be reduced fishing opportunities in FY2015 and FY2016 relative to prior years, likely resulting in increased negative social impacts for the fishery.

Landings of GOM cod and haddock are important to primary and secondary ports throughout the Northeast U.S., but ports in Maine, New Hampshire and Massachusetts that rely on fishing in the Gulf of Maine would be particularly impacted by this measure.

Compared to the catch limits specified in previous frameworks for the years immediately prior to 2014, the reduction in catch limits specified under Option 2 for some stocks are substantial and would be expected to have large negative social impacts (Table 58). In an attempt to avoid quota limited stocks with low annual catch limits, vessel operators in the groundfish fishery would be forced to modify where and how they fish having a negative impact on the *Historic and Present Participation* in the fishery. These reduced catch limits set by Option 2, would also have a negative social impact on the *Size and Demographics* of the groundfish fishery because of a probable reduction in fishing opportunity, revenue and employment. The reductions in catch limits included in Option 2, which are based on science that many Northeast fishermen consider flawed, could further erode the faith fishermen have in the quality of federal science. This continued lack of faith in the science used to direct management decisions could undermine the perceived legitimacy of future management actions and have a negative social impact on the formation of *Attitudes, Beliefs, and Values* about management.

U.S./Canada TACs

Comparing the proposed FY 2015 U.S. TACs to the FY 2014 U.S. TACs, the EGB haddock quota would increase by 68.7%, but EGB Cod and GB Yellowtail Flounder would decrease by 19.5% and 34.5%, respectively (Table 7 and Table 8). This could result in negative social impacts, if the ability to harvest the haddock is constrained by cod and yellowtail flounder. Vessel operators, families and communities that fish offshore, particularly those who are reliant on the groundfish fishing opportunities in EGB would experience the greatest impact from these changes. Specifying stocks on Georges Bank provide an incentive for offshore vessels to fish offshore. This could improve the *Non-Economic Social Aspects* of fishing. There could be reduced gear conflicts with smaller vessels on inshore grounds, improving safety and reducing fishing-related stress. The limitations imposed by the lowered TACs in the EGB could force fishermen to move to alternative fishing grounds or in some cases relocate their vessels to a different port as they adjust their fishing practices (Tuler et al. 2008).

Adjustments to ACL Distribution

The partial intent of adjusting the percent distribution of the total ACL between the groundfish fishery and the state waters and other sub-components is to better ensure that allowable catch is harvested. These adjustments would likely result in positive social impacts if Optimum Yield for groundfish can be better achieved.

Summary

Overall, the social impacts of Option 2 would be positive relative to No Action, but largely negative relative to the fishery in FY 2014.

7.5.1.3 SNE/MA (southern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

~~Social impacts to be written. Allocating sub-ACLs to individual components of the fleet can have positive social impacts because it creates a mechanism for each component of the fleet to be responsible and accountable for their own portion of the overall ACL. This has a positive impact on the *Social Structure and Organization* of the industry because individual components of the fleet are not accountable for overages caused by other components of the fleet.~~

~~However, depending on the perceived fairness of the initial distribution of allocation to each sub-component there is the potential for negative impacts to the *Social Structure and Organization* of the industry.~~

7.5.1.3.1 Option 1: No Action

~~Under Option 1, there would continue to be a single commercial sub-ACL for the SNE/MA windowpane flounder stock. The AMs for the commercial groundfish fishery would continue to account for overages of the overall ACL.~~

~~If the No Action alternative is adopted, there will be no sector or common pool sub-ACLs adopted for SNE/MA windowpane flounder. The potential social impacts associated with the adoption of the No Action alternative are small but mostly negative.~~

~~Adopting the No Action alternative would cause a negative social impact by reinforcing the Attitudes and Beliefs that the distribution of SNE/MA windowpane catch and responsibility is unfair. The lack of sub-ACLs maintains a system where the overall commercial groundfish fishery is accountable for any overages to the total ACL regardless of which component of the fleet (sector or common pool) is responsible for the overages. The perceived inequity could also cause resentment or conflict between fishing groups, another negative social impact in the form of changes to *Social Structures and Organizations*.~~

7.5.1.3.2 Option 2: Create SNE/MA Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

~~Under Option 2, the SNE/MA windowpane flounder stock would be split into sub-ACLs for groundfish sectors and the common pool based on a specified percentage. The Council would select a percentage for this measure that would apply to all future allocations.~~

~~The adoption of option 2 would split the commercial sub-ACL between sectors and the common pool based on each fleet's catch history from FY 2010 – FY 2013. This action makes groundfish sectors and the common pool accountable for their own catches of SNE/MA windowpane flounder. This would have a positive impact on the *Social Structure and Organization* of the industry because individual components of the fleet are not accountable for overages caused by other components of the fleet. This could result in positive social impacts on the *Attitudes, Beliefs, and Values* of the fishermen, because it may foster a sense of accountability within the fleet, giving each component of the fishery the incentive to maintain catch within their sub-ACL.~~

~~However, depending on the perceived fairness of the initial distribution of allocation to each sub-component there is the potential for negative impacts to the *Social Structure and Organization* of the industry.~~

7.5.1.4 GOM/GB (northern) Windowpane Flounder Sub-ACLs for Groundfish Sectors and the Common Pool

~~Allocating sub-ACLs to individual components of the fleet can have positive social impacts because it creates a mechanism for each component of the fleet to be responsible and accountable for their own portion of the overall ACL. This has a positive impact on the *Social Structure and Organization* of the industry because individual components of the fleet are not accountable for overages caused by other components of the fleet.~~

~~However, depending on the perceived fairness of the initial distribution of allocation to each sub-component there is the potential for negative impacts to the *Social Structure and Organization* of the industry.~~

7.5.1.4.1 Option 1: No Action

~~Under Option 1, there would continue to be a single commercial sub-ACL for the GOM/GB windowpane flounder stock. The AMs for the commercial groundfish fishery would continue to account for overages of the overall ACL.~~

~~If the No Action alternative is adopted, there will be no sector or common pool sub-ACLs adopted for GOM/GB windowpane flounder. The potential social impacts associated with the adoption of the No Action alternative are small but mostly negative.~~

~~Adopting the No Action alternative would cause a negative social impact by reinforcing the Attitudes and Beliefs that the distribution of GOM/GB windowpane catch and responsibility is unfair. The lack of sub-ACLs maintains a system where the overall commercial groundfish fishery is accountable for any overages to the total ACL regardless of which component of the fleet (sector or common pool) is responsible for the overages. The perceived inequity could also cause resentment or conflict between fishing groups, another negative social impact in the form of changes to *Social Structures and Organizations*.~~

7.5.1.4.2 Option 2: Create GOM/GB Windowpane Flounder sub-ACLs for Groundfish Sectors and the common pool

~~Under Option 2, the GOM/GB windowpane flounder stock would be split into sub-ACLs for groundfish sectors and the common pool based on a specified percentage. The Council would select a percentage for this measure that would apply to all future allocations.~~

~~The adoption of option 2 would split the commercial sub-ACL between sectors and the common pool based on each fleet's catch history from FY 2010 – FY 2013. This action makes groundfish sectors and the common pool accountable for their own catches of GOM/GB windowpane flounder. This would have a positive impact on the *Social Structure and Organization* of the industry because individual components of the fleet are not accountable for overages caused by other components of the fleet. This could result in positive social impacts on the *Attitudes, Beliefs, and Values* of the fishermen, because it may foster a~~

~~sense of accountability within the fleet, giving each component of the fishery the incentive to maintain catch within their sub-ACL.~~

~~However, depending on the perceived fairness of the initial distribution of allocation to each sub-component there is the potential for negative impacts to the *Social Structure and Organization* of the industry.~~

7.5.1.5 GOM/GB Windowpane Flounder Scallop Fishery Sub-ACL

Allocating sub-ACLs to individual components of the fleet can have positive social impacts because it creates a mechanism for each component of the fleet to be responsible and accountable for their own portion of the overall ACL. This has a positive impact on the *Social Structure and Organization* of the industry because individual components of the fleet are not accountable for overages caused by other components of the fleet.

However, depending on the perceived fairness of the initial distribution of allocation to each sub-component there is the potential for negative impacts to the *Social Structure and Organization* of the industry.

7.5.1.5.1 Option 1: No Action

If the No Action alternative is adopted, there will be no additional sub-ACLs adopted for GOM/GB windowpane flounder. The potential social impacts associated with the adoption of the No Action alternative are negative.

Adopting the No Action alternative would cause a negative social impact by reinforcing the Attitudes and Beliefs that the distribution of GOM/GB windowpane catch and responsibility is unfair. The allocation of some portion of the GOM/GB windowpane ACL to the “other sub-component” of the fishery would be maintained, but would continue to hold the groundfish fishery accountable for any overages to the total ACL. Although the scallop fishery does not land GOM/GB windowpane, their catches account for a substantial portion of the overall catch (Table 14). The perceived inequity resulting from the No Action alternative could also cause resentment or conflict between fishing groups, another negative social impact in the form of changes to *Social Structures and Organizations*.

7.5.1.5.2 Option 2: Create a Scallop Fishery GOM/GB Windowpane Flounder Sub-ACL

The adoption of Option 2 would allocate a portion (fishery of the GOM/GB windowpane flounder ACL to the scallop fishery to account for incidental catches in that fishery. Previously, allocations of GOM/GB windowpane to the scallop fishery were considered part of the “other sub-component” and were not subject to any specific scallop fishery AMs. From 2001 to 2010, it is estimated that the scallop fishery has caught an estimated average of 8% of the GOM/GB windowpane yearly catch. Option 2 would allocate to the Scallop fishery between 2%-14% of the total ACL based on a percentage of recent catches in the scallop fishery as shown. AMs for the scallop fishery and this sub-ACL would be adopted by the scallop FMP within one year of the implementation of this sub-ACL.

Option 2 would distribute the catch of GOM/GB windowpane flounder differently than has been done in the past, which may cause a range of social impacts, differentially distributed, on the multispecies and scallop fleets.

Communities and individuals that have a greater dependence on the scallop fishery, compared to the multispecies fishery, may experience some small but negative social impacts associated with Option 2. A new, scallop specific, sub-ACL and AM could be seen as somewhat restrictive and may affect the Historic and Present Participation if the sub-ACL is set at a level substantially different than the historic catch. If a scallop specific AM is triggered due to a scallop sub-ACL overage, the Size and Demographics of the scallop fishery could be negatively affected as the AM could limit future fishing opportunity.

Overall, option 2 is likely to have positive social impacts. The groundfish fleet will no longer be accountable for overages caused by the scallop fleet resulting in a positive impact on the *Social Structure and Organization* of the industry. This may also have positive social impacts on the *Attitudes, Beliefs, and Values* of the fishermen, because it creates a sense of fairness between the groundfish and scallop fleets and may foster a sense of accountability within each fleet, giving each component of the fishery the incentive to maintain catch within their sub-ACL.

7.5.2 Commercial and Recreational Fishery Measures

7.5.2.1 GOM Cod Spawning Area Closures

GOM Cod Spawning Area Closure alternatives will have numerous social impacts across various fisheries and communities. The most direct impacts will be on vessels currently fishing in these areas that will no longer have access due to the expanded closures. The addition of new spawning closures would force fishing operations with gear capable of catching groundfish to modify where and how they fish, having a negative impact on the *Historic and Present Participation* in the affected fisheries. This would also have a negative social impact on the *Size and Demographics* of the affected fisheries because of a probable reduction in fishing opportunity, revenue, and employment. Negative social impacts would be expected in *Life-style/Non-economic social aspects* of the fishery, as fishermen would have less flexibility in choosing where to fish.

The ability to adapt to the spawning closures is highly variable. Less mobile fishermen may bear a heavier burden as they are less able to easily switch harvest areas. Smaller vessels will be less able to adapt to these near shore closures as their range is limited and they cannot easily target offshore areas. Any change in fishing behavior that attempts to employ a more mobile fishing strategy will have additional social costs such as disruptions to family and community life as well as increasing the likelihood of safety risks. Increased risk can result when fishermen spend longer periods at sea in order to access offshore areas that will not be affected by the closures. Fishermen severely impacted by the new closed areas may leave fishing entirely or at least seek temporary opportunities in another fishery or gear type that is less affected by the management alternatives. Both possibilities would cause a change in the *Size and Demographics* of the different fisheries.

Those communities that are more dependent on groundfish and are located in proximity to the proposed closures such as communities in Maine, New Hampshire and Massachusetts (See Economic Impacts, Section 7.4) will have larger social impacts than those that participate in a range of fisheries including areas further offshore. Negative impacts on *Attitudes, Beliefs, and Values* may be based on perceptions of differing levels of impact to particular gear types or fisheries. For example, the spawning protection areas are identified to improve cod spawning protection; however the restrictions impact a wide range of vessels capable of catching groundfish, including those where cod may not be the primary target. This may cause resentment among fishermen using gear types that are capable of catching groundfish and will be affected by the restrictions, but do not target cod and are thus unlikely to benefit from future cod spawning improvement, negatively affecting the *Social Structures and Organizations* of a community.

Additionally, the impacts of recreational fishing on spawning cod are not as well documented therefore these restrictions may be seen as overly restrictive. However, because the closure affects commercial and recreational fishermen equally, it could help to promote perceptions of equity among the two fleets.

There are many instances in which fishermen have differing views than those held by ocean and fisheries scientists. A fisherman's view is based largely on personal experience and their own proximal environment, which can be at odds with the larger environment described by fisheries scientists. This continued lack of faith in the science used to direct management decisions could undermine the perceived legitimacy of future management actions and have a negative social impact on the formation of *Attitudes and Beliefs* about management. The impact of revising GOM cod spawning closures on the *Attitudes, Beliefs, and Values* of fishermen is uncertain and is largely related to the level of acceptance and belief in the efficacy of the new closures to adequately protect spawning cod without placing undue restrictions during areas and times when cod are not spawning. In informational interviews conducted by the Council related to spawning closure alternatives in the Habitat Omnibus Amendment, some members of the fishery mentioned that due to the output controls associated with sector management there is no need for additional spawning protection.

There is the potential for positive social impacts derived from new spawning closures. These are generally associated with the potential future and long-term benefits created by the improvement of fish stocks generated from new spawning closures. These benefits are difficult to analyze because of the uncertainty associated with the magnitude of the benefit, how these benefits would be distributed among fishing communities, and the timing of these impacts. For example, vessels that are unable to adapt to new restrictions in the short-term may not be able to benefit from the potential stock increases in the long-term. Additionally, the short-term impacts on markets, processing capability, and other infrastructure during the period of adjustment to the new closures may be such that these shoreside resources are lost and unable to recover in the future when potential stock increases occur. However, given the current status of GOM cod future improvements to the stock could have large positive social impacts.

7.5.2.1.1 Option 1: No Action

Option 1 maintains the current GOM cod spawning protection for commercial and recreational vessels known as the whaleback closure implemented through FW 45.

The social impacts associated with Option 1/No Action are expected to be neutral as it would maintain the status quo. There may be some negative impacts on the *Attitudes, Beliefs, and Values* of members of the groundfish fishery related to the lack of flexibility of management as this would maintain current spawning closures and disregard more current research concerning timing and location of cod spawning. Given the current status of the GOM cod stock this may be seen as a missed opportunity to implement new management that could help improve the GOM cod population. In the long-term, if spawning cod is not adequately protected by No Action, there could be negative social impacts if there are fishery declines as a result.

7.5.2.1.2 Option 2: Additional GOM cod Spawning Protection Measures

Under Option 2, additional GOM cod spawning closures would be created in the Gulf of Maine for commercial and recreational groundfish fisheries.

<u>Sub-Option A:</u>

Sub-option A would create new seasonal GOM cod spawning closure areas in discreet 30-minute blocks and a year-round spawning closure using the boundaries of the existing Western Gulf of Maine (WGOM) Closed Area (Figure 1).

The short-term social impacts of Sub-Option A are expected to be negative as the new closures restrict access to many inshore fishing areas. These impacts will particularly affect smaller vessels from the communities in Maine, New Hampshire and Massachusetts. Additionally, these new closures would apply to recreational vessels which would also be prohibited from fishing in the current Western Gulf of Maine Closure. This would have large negative impacts on the recreational fishery. Overall, the negative short-term social impacts of Sub-Option A would be greater than the impacts associated with Sub-Option B. The long term social impacts of Sub-Option A are expected to be positive if the protection of spawning cod leads to increased cod populations.

Sub-Option B:
Sub-Option B would create seasonal GOM cod spawning closure areas in discreet 30-minute blocks (see figure 3).

The short-term social impacts of Sub-Option B are expected to be negative as the new closures restrict access to many inshore fishing areas. These impacts will particularly affect smaller vessels from the communities in Maine, New Hampshire and Massachusetts. Overall, the short-term social impacts of Sub-Option B would be less negative than the impacts associated with Sub-Option A. The long term social impacts of Sub-Option A are expected to be positive if the protection of spawning cod leads to increased cod populations.

7.5.2.2 Prohibition on the Possession of GOM cod

7.5.2.2.1 Option 1: No Action

Under Option 1, there would be no revision to the retention regulations of GOM cod.

If Option 1 is selected, the social impacts are expected to be mixed. If a very low GOM cod ACL is selected, there could be negative social impacts to the *Attitudes, Beliefs, and Values* of fishermen and other stakeholders towards management, in allowing a stock with a very low ACL to be targeted. However, allowing GOM cod landings maintains the continuous collection of data on GOM cod catch, which could have a positive impact on *Attitudes, Values and Beliefs* of fishermen and other stakeholders towards fisheries science.

7.5.2.2.2 Option 2: Prohibition on the possession of GOM cod

Under Option 2, for commercial and recreational vessels, there would be zero possession of GOM cod, i.e., they would be required to discard all catch of GOM cod. There would be no change in how GOM cod is allocated, and there would be no changes made to catch accounting or accountability measures.

If Option 2 is selected, the social impacts are expected to be negative. Though the sub-ACL of GOM cod is expected to be low, regulatory discarding of marketable fish causes a loss of potential revenue, which can have a negative effect on the *Size and Demographic Characteristics* of the fishery. Discarding fish can have a negative impact on the *Attitudes, Beliefs, and Values* of fishermen and other stakeholders relative to the perceptions of fisheries management and the moral dilemmas fishermen face at sea. It could also cause a demoralizing sense of waste among those forced to discard marketable fish, impacting the *Non-Economic Social Aspects* of the fishery. Moreover, larger vessels from Gulf of Maine ports may be able to fish on Georges Bank and land more cod, increasing perceptions of inequity in some communities. This often exacerbates conflicts between sectors of the industry, a negative impact on the *Non-Economic Social Aspects* of fishing. There could be intracommunity conflict and loss of community cohesion as a result, a negative impact on *Social Structure and Organization*. Additionally, this leads to a loss of data about a fishery at a critical point, so the long term negative impacts could be large. Thus, the overall impact of Option 2 relative to No Action is negative.

7.5.2.3 Observer Requirements in the Gulf of Maine

7.5.2.3.1 Option 1: No Action

Under No Action, commercial vessels would be permitted to fish throughout the Gulf of Maine, and in multiple broad stock areas on a given trip, provided they comply with all applicable federal reporting requirements.

If Option 1 is selected, there would be no additional social impacts relative to the status quo.

7.5.2.3.2 Option 2: Revised Observer Requirements on trips in the GOM

Under Option 2, commercial vessels would be prohibited to fish west of 70°15' W longitude from also conducting fishing activity east of 70°15' W longitude, on the same trip, unless carrying an observer. Vessels fishing east of 70°15' W longitude in a one broad stock area may not fish west of this line on the same trip without an observer.

It Option 2 is selected, catch accounting would become more fine scale. Vessels that are capable of fishing east of 70°15' W longitude (primarily larger vessels) would be more constrained by this option relative to No Action, since when they are not carrying an observer, they would have to either fish exclusively in BSA 1, or in multiple BSAs east of 70°15' W longitude (Figure 7). Negative social impacts would be expected in *Life-style/Non-economic social aspects* of the fishery, as fishermen would have less flexibility in choosing where to fish. This may increase perceptions of inequity in some communities. This often exacerbates conflicts between sectors of the industry, a negative impact on the *Non-Economic Social Aspects* of fishing. While this practice is currently adopted in sector operations plans, which are reviewed and revised on an annual basis, requiring this through the regulatory process could result in intracommunity conflict and loss of community cohesion, a negative impact on *Social Structure and Organization*. Alternatively, increasing catch accounting could improve the *Attitudes, Beliefs, and Values* of fishermen and other stakeholders towards management. Thus, the overall impact of Option 2 relative to No Action is low negative.

7.5.2.4 Rollover of Groundfish Specifications

7.5.2.4.1 Option 1: No Action

Under Option 1, in the event of a rulemaking delay, there would be no fishing for stocks without specifications in place on May 1, nor any fishing for other groundfish stocks that share the same Broad Stock Area as stocks with no specifications.

If Option 1 is selected, there would be no additional social impacts relative to the status quo. However, not having specifications in place at the start of the fishing year would result in negative impacts for the fishermen and fishing communities that rely on fishing in those Broad Stock Areas, because no directed multispecies trips would be allowed. The lack of specifications would not address the M-S Act requirements to achieve optimum yield and consider the needs of fishing communities. This would have a negative impact on the *Size and Demographic Characteristics* of the fishery, depending on the length of delay, as well as a negative impact on the *Attitudes, Beliefs, and Values* of the fishermen and other stakeholders towards management and the regulatory process. Most of the other federal fisheries in the Northeast have rollover or default provisions in place, so not having one for the multispecies fishery could cause conflict and perceptions of inequity between fishermen, a negative impact on the *Non-Economic Social Aspects* of fishing. While non-groundfish fisheries with sub-ACLs for groundfish stocks are not required to cease fishing in the absence of specifications for a groundfish stock (e.g., scallop and whiting fisheries), these fisheries may be subject to accountability measures for overages in the following fishing year. To date, there has not been a rulemaking delay on specifications in the multispecies fishery, in part, because the lack of a rollover provision has incentivized a timely assessment, management and regulatory process. Thus, Option 1 would have no additional social impacts, though a lack of specifications would be negative.

7.5.2.4.2 Option 2: Percentage Rollover Provisions for Specifications

Under Option 2, a percentage of the prior year's ACL would be rolled over in the absence of specifications due to a delay in rule-making as identified in the sub-options. However, the rollover ACL may not exceed the anticipated ABC for the upcoming FY. Rollover specifications would be replaced by approved OFL and ABC values upon rulemaking. Catches occurring while rollover specifications are in place (after May 1st through final rulemaking) would be counted against the updated ACL for the FY.

Nothing in this measure would change the distribution or conditions of the commercial and recreational fishery allocations (e.g. 20% holdback for groundfish sector ACE and trimester TAC).

If Option 2 is selected, the fishing year would be able to start on time, which would result in more positive social impacts relative to No Action. The fishery would be allowed to continue operations with less disruption, a positive impact in terms of the *Size and Demographic Characteristics* of the fishery, as well as the *Historical Dependence on and Participation* in the fishery. Option 2 would also improve the *Attitudes, Beliefs, and Values* of fishermen and other stakeholders about management, unless the annual specifications process became chronically delayed. Then, stakeholders may perceive that a rollover provision may be an excuse for delay in the assessment, management, and regulatory processes. Having a rollover provision may decrease conflict and improve perceptions of equity between fishery participants, because most of the other federal fisheries in the Northeast have a rollover provision in place, a positive impact on the *Non-Economic Social Aspects* of fishing.

Social impacts also depend on the specific percentage selected. Preliminary commercial catch data from prior fishing years can be used to estimate the timing of sub-ACL. By mid-August, about 30% through the fishing year, the percentage caught of each allocated stock has varied from 0.5% to 35.4% for FY 2012-FY 2014. Based on catch in these prior years, if specifications were in place by mid-August, it is unlikely that the fishery would be shut down under any of the sub-options considered by the Council (10%, 20%, 35%), except for the stock that was at 35.4%. The higher percentage sub-options would have less likelihood that the fishery would be constrained by the rule-making delay, and thus provide the most flexibility for the industry in the near-term.

Overall, the social impacts of Option 2 are expected to be low positive relative to No Action.

7.5.2.5 Sector ACE Carryover

7.5.2.5.1 Option 1: No Action

Under Option 1, groundfish sectors would continue to be allowed to carry over 10% of their unused ACE.

If Option 1 is selected, there would be no additional social impacts relative to the status quo. In the event of bad weather or unforeseen circumstances near the end of the fishing year that prevents the groundfish fleet from using the entire sub-ACL, a carryover provision would improve safety at sea and allow vessels to fully utilize their allocation in the following year, which would otherwise go unharvested. Thus, Option1 would have a positive impact on *Non-Economic Social Aspects* of the groundfish fishery (e.g., safety) and the *Size and Demographic Characteristics* of the fishery-related workforce (e.g., employment). This alternative would promote certainty in business planning, which would have a positive impact on the *Non-Economic Social Aspects* of the fishery.

7.5.2.5.2 Option 2: Modification to Sector ACE carryover

Under Option 2, the Amendment 16 carryover provisions would be modified. Groundfish sectors would be able to carry forward up to 10% of unused ACE provided that: the total unused sector ACE carried forward for all sectors from the previous FY does not exceed the ABC level minus the ACL for the fishing year in which the carryover would be landed (e.g., FY 2015).

If Option 2 is selected, there would likely be positive social impacts in terms of the *Attitudes, Beliefs, and Values* of fishermen and other stakeholders towards management, because the U.S. District Court for the District of Columbia's April 4, 2014 ruling would be addressed regarding NMFS' carryover-related Framework Adjustment 50 measures. By selecting Option 2, the Council may be perceived in a more positive light, because it would be taking action to modify the carryover-related measures. Without Council action, NMFS would likely be required to take unilateral action. Limiting the carryover to the ABC level minus the ACL (i.e., management uncertainty) for the fishing year in which the carryover will be landed would reduce the risks associated with increased management uncertainty compared to a full carryover option.

The social impacts of Option 2 relative to Option 1 would depend on the magnitude of the management uncertainty for the coming fishing year relative to what 10% of unused sector ACE would be.

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~~7.6 Cumulative Effects Analysis~~

7.6.1 ~~Introduction~~

~~A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions 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. This section serves to examine the potential direct and indirect effects of the alternatives in Framework 52 together with past, present, and reasonably foreseeable future actions that affect the human environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.~~

~~Valued Ecosystem Components (VEC)~~
~~As noted in Section 6.0 (Description of the Affected Environment), the VECs that exist within the groundfish fishery are identified and the basis for their selection is established. Those VECs were identified as follows:~~

1. ~~Regulated groundfish stocks (target and non-target);~~
2. ~~Non-groundfish species (incidental catch and bycatch);~~
3. ~~Endangered and other protected species;~~
4. ~~Habitat, including non-fishing effects; and~~
5. ~~Human Communities (includes economic and social effects on the fishery and fishing communities).~~

~~Temporal Scope of the VECs~~
~~While the effects of historical fisheries are considered, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery, rather than foreign fleets. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, this analysis examines the period between the expected implementation of this framework (November, 2014) and 2020.~~

~~Geographic Scope of the VECs~~
~~The geographic scope of the analysis of impacts to regulated groundfish stocks, non-groundfish species and habitat for this action is the total range of these VECs in the Western Atlantic Ocean, as described in the Affected Environment section of the document (Section 6.0). However, the analyses of impacts presented in this framework focuses primarily on actions related to the harvest of the managed resources. The result is a more limited geographic area used to define the core geographic scope within which the majority of harvest effort for the managed resources occurs. For endangered and protected species, the geographic range is the total range of each species (Section 6.4).~~

~~Because the potential exists for far-reaching sociological or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure sociological and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the groundfish fishery (Section 6.5) from the U.S.-Canada border to, and including, North Carolina.~~

~~Analysis of Total Cumulative Effects~~

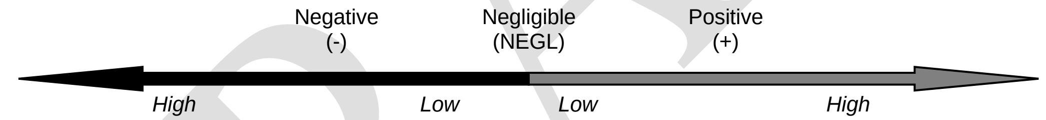
~~A cumulative effects assessment ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; PLUS (2) the baseline condition for resources and human communities (note – the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); PLUS (3) impacts from the Preferred Alternative and other alternatives.~~

~~A description of past, present and reasonably foreseeable future actions is presented in Table 78 . The baseline conditions of the resources and human community are subsequently summarized although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this framework is included. The culmination of all these factors is considered when making the cumulative effects assessment.~~

~~Impact definitions for the tables in this section are as summarized in Table 77.~~

~~**Table 92 - Impact definitions for cumulative effects analyses.**~~

		~~Direction~~	
~~VEC~~	**~~Positive (+)~~**	**~~Negative (-)~~**	**~~Negligible/Neutral~~**
~~Allocated target species, other landed species, and protected resources~~	~~Actions that increase stock/population size~~	~~Actions that decrease stock/population size~~	~~Actions that have little or no positive or negative impacts to stocks/populations~~
~~Physical Environment/ Habitat/EFH~~	~~Actions that improve the quality or reduce disturbance of habitat~~	~~Actions that degrade the quality or increase disturbance of habitat~~	~~Actions that have no positive or negative impact on habitat quality~~
~~Human Communities~~	~~Actions that increase revenue and social well-being of fishermen and/or associated businesses~~	~~Actions that decrease revenue and social well-being of fishermen and/or associated businesses~~	~~Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses~~
		~~Impact Qualifiers:~~	
~~All VECs: Mixed~~	**~~both positive and negative~~**		
~~Low (L, as in low positive or low negative)~~	~~To a lesser degree~~		
~~High (H; as in high positive or high negative)~~	~~To a substantial degree~~		
~~Likely~~	~~Some degree of uncertainty associated with the impact~~		



7.6.2 ~~Past, Present and Reasonably Foreseeable Future Actions~~

~~The following is a synopsis of the most applicable past, present, and reasonably foreseeable future actions (PPRFFA) that have the potential to interact with the current action. For a complete historical list of PPRFFAs, please see Amendment 16 – the last EIS developed for the NE Multispecies FMP.~~

~~Table 93- Summary of Effects on VECs from Past, Present, and Reasonably Foreseeable Future FMP and Other Fishery Related Actions.~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~Past and Present Fishing Actions~~					
~~Amendment 13 (2004) – Implemented requirements for stock rebuilding plans and dramatically cut fishing effort on groundfish stocks.~~ ~~Implemented the process for creating sectors and established the GB Cod Hook Gear Sector~~	~~L+~~	~~H+~~	~~+~~ -	~~L+~~ -	~~Mixed~~
~~FW 40A (2004) – allowed additional fishing on GB haddock for sector and non-sector hook gear vessels, created the GB haddock Special Access Pilot Program, and created flexibility by allowing vessels to fish inside and outside the U.S./Canada Area on the same trip~~	~~Negl~~	~~L-~~	~~L-~~	~~Negl~~	~~+~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~FW40B (2005) – Allowed Hook Sector members to use GB cod landings caught while using a different gear during the landings history qualification period to count toward the share of GB cod that will be allocated to the sector, revised DAS leasing and transfer programs, modified provisions for the Closed Area II yellowtail flounder SAP, established a DAS credit for vessels standing by an entangled whale, implemented new notification requirements for Category I herring vessels, and removed the net limit for trip gillnet vessels.~~	~~Negl to L+~~	~~L-~~	~~L-~~	~~Negl~~	~~L+~~
~~FW41 (2005) – Allowed for participation in the Hook Gear Haddock SAP by non-sector vessels~~	~~Negl~~	~~Negl~~	~~Negl to L -~~	~~Negl~~	~~+~~
~~FW42 (2006) – Implemented further reductions in fishing effort based upon stock assessment data and stock rebuilding needs, implemented GB Cod Fixed Gear Sector~~	~~L+~~	~~+~~	~~+~~	~~L+~~	~~Mixed~~
~~Atlantic Large Whale Take Reduction Plan~~	~~Negl to L-~~	~~Negl~~	~~Negl~~	~~+~~	~~L-~~
~~Monkfish Fishery Management Plan and Amendment 5 (2011)~~ ~~Implemented ACLs and AMs; set the specifications of DAS and trip limits; and make other adjustments to measures in the Monkfish FMP.~~	~~L+~~	~~+~~	~~+~~	~~+~~	~~Mixed~~
~~Spiny Dogfish Fishery Management Plan~~	~~Negl~~	~~Negl~~	~~+~~	~~Negl~~	~~L+~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~Amendment 16 to the Northeast Multispecies FMP (2009)~~ ~~Implemented DAS reductions and gear restrictions for the common pool, approved formation of additional 17 sectors~~	~~+~~	~~+~~	~~+~~	~~+~~	~~Mixed~~
~~Skate Fishery Management Plan and Amendment 3 (2010)~~ ~~Amendment 3 implemented final specifications for the 2010 and 2011 FYs, implemented ACLs and AMs, implemented a rebuilding plan for smooth skate and established an ACL and annual catch target for the skate complex, total allowable landings for the skate wing and bait fisheries, seasonal quotas for the bait fishery, new possession limits, in season possession limit triggers.~~	~~+~~	~~+~~	~~+~~	~~+~~	-
~~FW 44 to the Northeast Multispecies FMP (2010)~~ ~~Set ACLs, established TACs for transboundary U.S./CA stocks, and made adjustments to trip limits/DAS measures~~	~~+~~	~~+~~	~~+~~	~~+~~	~~Mixed~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~FW 45 to the Northeast Multispecies FMP (2011)~~ ~~Revised the biological reference points and stock status for pollock, updated ACLs for several stocks for FYs 2011–2012, adjusted the rebuilding program for GB yellowtail flounder, increased scallop vessel access to the Great South Channel Exemption Area, modified the existing dockside and at-sea monitoring requirements, established a GOM Cod Spawning Protection Area, authorized new sectors and adjusted TACs for stocks harvested in the US/ CA area for FY 2011.~~	~~L+~~	~~L+~~	~~L+~~	~~L+~~	~~Mixed~~
~~FW 46 to the Northeast Multispecies FMP (2011)~~ ~~Increased the haddock catch cap for the herring fishery to 1% of the haddock ABC for each stock of haddock.~~	~~Negl~~	~~Negl~~	~~Negl~~	~~Negl~~	~~L-~~
~~Harbor Porpoise Take Reduction Plan (2010)~~ ~~Plan was amended to expand seasonal and temporal requirements within the HPTRP management areas; incorporate additional management areas; and create areas that would be closed to gillnet fisheries if certain levels of harbor porpoise bycatch occurs.~~	~~Likely +~~	~~Likely +~~	~~Likely +~~	~~Likely +~~	~~Likely -~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~Scallop Amendment 15 (2011)~~ ~~Implemented ACLs and AMs to prevent overfishing of scallops and yellowtail flounder; addressed excess capacity in the LA scallop fishery; and adjusted several aspects of the overall program to make the Scallop FMP more effective, including making the EFH closed areas consistent under both the scallop and groundfish FMPs for scallop vessels.~~	~~Negl~~	~~L+~~	~~Negl~~	~~Negl~~	~~L+~~
~~Amendment 17 to the Northeast Multispecies FMP~~ ~~This amendment streamlined the administration process whereby NOAA-sponsored, state-operated permit banks can operate in the sector allocation management program~~	~~Negl~~	~~Negl~~	~~Negl~~	~~Negl~~	~~Negl~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~FW 47 to the Northeast Multispecies FMP (2012)~~ ~~FW 47 measures include revisions to the status determination for winter flounder, revising the rebuilding strategy for GB yellowtail flounder, Measures to adopt ACLs, including relevant sub-ACLs and incidental catch TACs; adopting TACs for U.S/Canada area, as well as modifying management measures for SNE/MA winter flounder, restrictions on catch of yellowtail flounder in GB access areas and accountability measures for certain stocks~~	~~Negl~~	~~+~~	~~+~~	~~Negl~~	~~-~~
~~Secretarial Amendment to Establish Annual Catch Limits and Accountability Measures for the Small-Mesh Multispecies Fishery~~ ~~This amendment established the mechanism for implementing ACLs and AMs.~~	~~Negl to L+~~	~~Negl~~	~~Negl~~	~~Negl~~	~~Negl to +~~
~~Amendment 3 to the Spiny Dogfish FMP~~ ~~This amendment established a research set aside program, updates to EFH definitions, year-end rollover of management measures and revisions to the quota allocation scheme.~~	~~Likely Negl~~	~~Likely Negl~~	~~Likely L+~~	~~Likely Negl~~	~~Likely L+~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~Framework 24 to the Atlantic Sea Scallop FMP (Framework 49 to the Northeast Multispecies FMP)~~ ~~This framework set specifications for scallop FY 2013 and 2014. It is also considered measures to refine the management of yellowtail flounder bycatch in the scallop fishery~~	~~Likely Negl~~	~~Likely Negl to L+~~	~~Likely Negl to L+~~	~~Likely Negl~~	~~Likely - to +~~
~~FW 48 to the Northeast Multispecies FMP~~ ~~This FW modified the ACL components for several stocks, adjust AMs for commercial and recreational vessels, modify catch monitoring provisions, and allow sectors to request access to parts of groundfish closed areas.~~	~~Mixed~~	~~+~~	~~+~~	~~+~~	~~Mixed~~
~~FW50 to the Multispecies FMP~~ ~~This FW adopted FY2013-2015 ACLs and specifications for the U.S./Canada Total Allowable Catches (TACs)~~	~~+~~	~~+~~	~~+~~	~~Negl~~	~~-~~
~~FW51 to the Multispecies FMP~~ ~~This FW adopted FY2014-2014 ACLs and specifications for the U.S./Canada Total Allowable Catches (TACs) and included changes to management measures~~	~~Mixed~~	~~+~~	~~+~~	~~Negl~~	~~Mixed~~
~~Framework 25 to the Atlantic Sea Scallop FMP~~ ~~This framework sets specifications for scallop FY 2014 and 2015. It is also considering accountability measures for windowpane flounder stocks.~~	~~Likely Negl~~	~~Likely Negl to L+~~	~~Likely Negl to L+~~	~~Likely Negl~~	~~Likely - to +~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~Reasonably Foreseeable Future Fishing Actions~~					
~~Omnibus Essential Fish Habitat Amendment~~ **~~Phase 2 of the Omnibus EFH Amendment would consider the effects of fishing gear on EFH and move to minimize, mitigate or avoid those impacts that are more than minimal and temporary in nature. Further, Phase 2 would reconsider closures put in place to protect EFH and groundfish mortality in the Northeast Region.~~**	~~Likely +~~	~~Likely +~~	~~Likely +~~	~~ND~~	~~ND~~
~~Harbor Porpoise Take Reduction Plan (Potential Future Actions)~~ **~~Future changes to the plan in response to additional information and data about abundance and bycatch rates.~~**	~~Likely L+~~	~~Likely +~~	~~Likely +~~	~~Likely +~~	~~Likely -~~
~~FW53 to the Multispecies FMP~~ **~~This FW would adopt FY2015-2017 ACLs and specifications for the U.S./Canada Total Allowable Catches (TACs) and changes to management measures~~**	~~Mixed~~	~~+~~	~~+~~	~~Negl~~	~~Mixed~~
~~Framework 26 to the Atlantic Sea Scallop FMP~~ **~~This framework sets specifications for scallop FY 2016 and 2017. It is also considering accountability measures for northern windowpane flounder.~~**	~~Likely Negl~~	~~Likely Negl to L+~~	~~Likely Negl to L+~~	~~Likely Negl~~	~~Likely - to +~~

~~Actions~~	~~Habitat~~	~~Regulated Groundfish Stocks~~	~~Non-Groundfish Species~~	~~Endangered and other Protected Resources~~	~~Human Communities~~
~~A18 to the Multispecies FMP~~ ~~This amendment would create accumulation limits, a fishery for Handgear A, inshore/offshore measures for GOM cod, and trading mechanism for US/CA stocks.~~	~~Mixed~~	~~+~~	~~+~~	~~Negl~~	~~Mixed~~

~~Noted: ND= Not determined~~

~~Table 78 summarizes the combined effects of past, present and reasonably foreseeable future actions that affect the VECs, i.e., actions other than those alternatives under development in this document.~~

~~Note that most of the actions affecting this framework and considered in Table 79 come from fishery-related activities (e.g., federal fishery management actions – many of which are identified above in Table 78). As expected, these activities have fairly straightforward effects on environmental conditions, and were, are, or will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for federal fisheries management: the reauthorized Magnuson-Stevens Act. That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the act stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should be expected to result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are usually necessary to bring about long-term sustainability of a given resource and as such should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.~~

~~Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.~~

~~Framework Adjustment 53 (FW 53) is considering establishing a sub-ACL for northern windowpane flounder for the scallop fishery. Concurrently, Framework Adjustment 26 (FW 26) to the Scallop FMP is considering establishing an AM for the scallop fishery for the northern windowpane flounder. The sub-~~

~~ACL combined with the AMs may reduce flatfish bycatch in the scallop fishery overall, which may have potentially positive cumulative impacts on the groundfish resource and groundfish fishery.~~

~~**Table 94- Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Framework 52.**~~

~~VEC~~	~~Past Actions~~	~~Present Actions~~	~~Reasonably Foreseeable Future Actions~~	~~Combined Effects of Past, Present, Future Actions~~
~~Regulated Groundfish Stocks~~	~~**Mixed** Combined effects of past actions have decreased effort, improved habitat protection, and implemented rebuilding plans when necessary. However, some stocks remain overfished~~	~~**Positive** Current regulations continue to manage for sustainable stocks~~	~~**Positive** Future actions are anticipated to continue rebuilding and strive to maintain sustainable stocks~~	~~**Short-term Negative** Several stocks are currently overfished, have overfishing occurring, or both **Long-Term Positive** Stocks are being managed to attain rebuilt status~~
~~Non-Groundfish Species~~	~~**Positive** Combined effects of past actions have decreased effort and improved habitat protection~~	~~**Positive** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species~~	~~**Positive** Future actions are anticipated to continue rebuilding and target healthy stocks, thus limiting the take of discards/bycatch~~	~~**Positive** Continued management of directed stocks will also control incidental catch/bycatch~~
~~Endangered and Other Protected Species~~	~~**Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources~~	~~**Positive** Current regulations continue to control effort, thus reducing opportunities for interactions~~	~~**Mixed** Future regulations will likely control effort and thus protected species interactions, but as stocks improve, effort will likely increase, possibly increasing interactions~~	~~**Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions~~
~~Habitat~~	~~**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality~~	~~**Mixed** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality~~	~~**Mixed** Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities~~	~~**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality~~
~~Human Communities~~	~~**Mixed** Fishery resources have supported profitable industries and communities but increasing effort and catch limit controls have curtailed fishing opportunities~~	~~**Mixed** Fishery resources continue to support communities but increasing effort and catch limit controls combined with non-fishing impacts such as high fuel costs have had a negative economic impact~~	~~**Short-term Negative** As effort controls are maintained or strengthened, economic impacts will be negative **Long-term Positive** As stocks improve, effort will likely increase which would have a positive impact~~	~~**Short-term Negative** Revenues would likely decline dramatically in the short term and may remain low until stocks are fully rebuilt **Long-term Positive** Sustainable resources should support viable communities and economies~~

~~Impact Definitions:~~
~~-Regulated Groundfish Stocks, Non-groundfish species, Endangered and Other Protected Species: positive=actions that increase stock size and negative=actions that decrease stock size~~
~~-Habitat: positive=actions that improve or reduce disturbance of habitat and negative=actions that degrade or increase disturbance of habitat~~
~~-Human Communities: positive=actions that increase revenue and well-being of fishermen and/or associated businesses and negative=actions that decrease revenue and well-being of fishermen and/or associated businesses~~

7.6.3 ~~Baseline Conditions for Resources and Human Communities~~

~~For the purposes of a cumulative effects assessment, the baseline conditions for resources and human communities is considered the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. The following table (Table 80) summarizes the added effects of the condition of the VECs (i.e., status/trends from Section 6.2.1) and the sum effect of the past, present and reasonably foreseeable future actions (from Table 79 above). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, straightforward quantitative metrics of the baseline conditions are only available for the managed resources, non-target species, and protected resources. The conditions of the habitat and human communities VECs are complex and varied. As such, the reader should refer to the characterizations given in Sections 6.1 and 6.5 , respectively. As mentioned above, this cumulative effects baseline is then used to assess cumulative effects of the proposed management actions in Table 81.~~

~~Table 95- Cumulative effects assessment baseline conditions of the VECs.~~

~~VEC~~		**~~Status/Trends, Overfishing~~**	**~~Status/Trends, Overfished~~**	**~~Combined Effects of Past, Present Reasonably Foreseeable Future Actions (~~**~~Table 79~~**~~)~~**	**~~Combined CEA Baseline Conditions~~**
~~Regulated Groundfish Stocks~~	~~GB Cod~~	***~~Yes~~***	***~~Yes~~***	**~~Negative~~** ~~– short term: Several stocks are currently overfished, have overfishing occurring, or both;~~ **~~Positive~~** ~~– long term: Stocks are being managed to attain rebuilt status~~	**~~Negative~~** ~~– short term: Overharvesting in the past contributed to several stocks being overfished or where overfishing is occurring;~~ **~~Positive~~** ~~– long term: Regulatory actions taken over time have reduced fishing effort and with the addition of Amendment 16, stocks are expected to rebuild in the future~~
	~~GOM Cod~~	***~~Yes~~***	***~~Yes~~***		
	~~GB Haddock~~	~~No~~	~~No~~		
	~~GOM Haddock~~	***~~Yes~~***	~~No~~		
	~~GB Yellowtail Flounder~~	***~~Yes~~***	***~~Yes~~***		
	~~SNE/MA Yellowtail Flounder~~	~~No~~	~~No~~		
	~~CC/GOM Yellowtail Flounder~~	***~~Yes~~***	***~~Yes~~***		
	~~American Plaice~~	~~No~~	~~No~~		
	~~Witch Flounder~~	***~~Yes~~***	***~~Yes~~***		
	~~GB Winter Flounder~~	~~No~~	~~No~~		
	~~GOM Winter Flounder~~	~~No~~	***~~Yes~~***		
	~~SNE/MA Winter Flounder~~	~~No~~	***~~Yes~~***		
	~~Acadian Redfish~~	~~No~~	~~No~~		
	~~White Hake~~	~~No~~	~~No~~		
	~~Pollock~~	~~No~~	~~No~~		
	~~Northern (GOM-GB) Windowpane Flounder~~	***~~Yes~~***	***~~Yes~~***		
	~~Southern (SNE-MA) Windowpane Flounder~~	~~No~~	~~No~~		
	~~Ocean Pout~~	~~No~~	***~~Yes~~***		
	~~Atlantic Halibut~~	~~No~~	***~~Yes~~***		
	~~Atlantic Wolffish~~	~~n/a~~	***~~Yes~~***		

~~**Table 80 cont'd.**~~

~~**VEC**~~		~~**Status/Trends**~~	~~**Combined Effects of Past, Present Reasonably Foreseeable Future Actions (**Table 79**)**~~	~~**Combined CEA Baseline Conditions**~~
~~**Non-groundfish Species (principal species listed in section 6.3)**~~	~~**Monkfish**~~	~~Not overfished and overfishing is not occurring.~~	~~**Positive** – Continued management of directed stocks will also control incidental catch/bycatch.~~	~~**Positive** – Although prior groundfish management measures likely contributed to redirecting effort onto non-groundfish species, as groundfish rebuild this pressure should lessen and all of these species are also managed through their own FMP.~~
	~~**Dogfish**~~	~~Not overfished and overfishing is not occurring.~~		
	~~**Skates**~~	~~Thorny skate is overfished but overfishing is not occurring. All other skate species are not overfished and overfishing is not occurring.~~		
~~**Habitat**~~		~~Fishing impacts are complex and variable and typically adverse (see section 6.1); Non-fishing activities had historically negative but site-specific effects on habitat quality.~~	~~**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities. An omnibus amendment to the FMP with mitigating habitat measures is under development.~~	~~**Mixed** - reduced habitat disturbance by fishing gear but impacts from non-fishing actions, such as global warming, could increase and have a negative impact.~~
~~**Protected Resources**~~	~~**Sea Turtles**~~	~~Leatherback, Kemp's ridley and green sea turtles are classified as endangered under the ESA and loggerhead sea turtles are classified as threatened.~~	~~**Positive** – reduced gear encounters through effort reductions and management actions taken under the ESA and MMPA have had a positive impact~~	~~**Positive** – reduced gear encounters through effort reductions and additional management actions taken under the ESA and MMPA.~~
	~~**Fish**~~	~~Atlantic salmon, Shortnose sturgeon, and Atlantic sturgeon are classified as endangered under the ESA; Atlantic sturgeon Gulf of Maine DPS is listed as threatened; cusk and dusky shark are candidate species~~		
	~~**Large Cetaceans**~~	~~Of the baleen whales (right, humpback, fin, blue, sei and minke whales) and sperm whales, all are protected under the MSA and with the exception of minke whales, all are listed as endangered under the ESA.~~		
	~~**Small Cetaceans**~~	~~Pilot whales, dolphins and harbor porpoise are all protected under the MSA, the HPTRP and the Large Whale Take Reduction Plan Amendment~~		
	~~**Pinnipeds**~~	~~ESA classification: Endangered, number of nesting females below sustainable level; taken by longfin trawl~~		

~~**Table 80 cont'd.**~~

~~**VEC**~~	~~**Status/Trends**~~	~~**Combined Effects of Past, Present Reasonably Foreseeable Future Actions (**Table 79**)**~~	~~**Combined CEA Baseline Conditions**~~
~~**Human Communities**~~	~~Complex and variable (see Section 6.5). Although there are exceptions, generally groundfish landings have decreased for most New England states since 2001. Declines in groundfish revenues since 2001 have also generally occurred.~~	~~**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past several years have had negative impacts on communities~~	~~**Negative** – short term: lower revenues would continue until stocks are sustainable~~ ~~**Positive** – long term: sustainable resources should support viable communities and economies~~

7.6.4 ~~Summary Effects of Framework 52 Actions~~

~~The alternatives contained in Framework 52 are focused on changes to management measures. The action modifies commercial groundfish fishing measures including accountability measures for northern and southern windowpane flounder stocks.~~

~~Amendment 16 defined the fishing mortality targets needed to rebuild groundfish stocks and end overfishing, and adopted a complex suite of measures designed to achieve these mortality objectives. This action further builds upon the specifications adopted in Frameworks 44, 45, 46, 47, 48, 50, and 51 that used the best available science to translate those mortality targets into specific amounts of fish. These quantities must be defined in order to implement the ACLs and AMs called for in the amendment. The AMs identified in FW 52 are thus consistent with the amendment. These measures affect the prosecution of the commercial fishery. The proposed changes would modifies commercial groundfish fishing measures including accountability measures for northern and southern windowpane flounder stocks, and would allow for more flexibility for the fishing industry.~~

~~In general, the adoption of these measures will benefit groundfish stocks because it will be more likely that mortality targets will not be exceeded. The Preferred Alternatives are designed to mitigate ACL overages in the windowpane flounder stocks of the Northeast Multispecies fishery. The measure is not likely to impact non-groundfish stocks, protected species, or habitat to any great extent when compared to the No Action alternative, since these proposed modifications to the accountability measures continue to reduce catches of windowpane flounder stocks when compared to the No Action alternative.~~

~~**Table** 96 Summary of Impacts expected on the VECs.~~

~~**Management Measure**~~		~~**VECs**~~				
		~~**Managed Resources**~~	~~**Non-target Species**~~	~~**Protected Resources**~~	~~**Habitat Including EFH**~~	~~**Human Communities**~~
~~**COMMERCIAL FISHERY MEASURES**~~	~~**GROUNDFISH FISHERY ACCOUNTABILITY MEASURES FOR NORTHERN AND SOUTHERN WINDOWPANE FLOUNDER**~~	~~**Positive** – More effective accountability measures will reduce risk of exceeding mortality targets on these stocks and promote rebuilding~~	~~**No impact** – measures are not expected to create additional impacts to non-target species~~	~~**No impact** – measures are not expected to create additional impacts to protected resources~~	~~**No impact** – measures are not expected to create additional impacts to habitat~~	~~**Mixed** – Overall revenues will increase as stocks rebuild, however restrictions may constrain fishing~~

7.6.5 ~~Cumulative Effects Summary~~

~~The regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, habitat, and human communities. Consistent with NEPA, the M-S Act requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs (except short-term impacts to human communities) from past, present and reasonably foreseeable future actions, when combined with baseline conditions, have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive.~~

~~Table 80 provides as a summary of likely cumulative effects found in the various groups of management alternatives contained in Framework 52. The CEA baseline that, as described above in Table 81, represents the sum of the past, present, and reasonably foreseeable future (identified hereafter as "other") actions and conditions of each VEC. When an alternative has a positive effect on a VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with the "other" actions that were also designed to increase stock size. In contrast, when an alternative has a negative effect on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the "other" actions. The resultant positive and negative cumulative effects are described below for each VEC.~~

~~Managed Resources~~

~~As noted in Table 81, the combined impacts of past federal fishery management actions have led to short-term impacts that result in overfishing and/or overfished status for several stocks. However, management measures, in particular modifications implemented through Amendment 16 to the FMP, are expected to yield rebuilt sustainable groundfish stocks in the future. The action proposed by Framework 52 is expected to continue this trend. The adoption of revised accountability measures for the groundfish fishery for northern and windowpane flounder stocks are designed to meet fishing mortality targets and to promote stock rebuilding. The past and present impacts, combined with the Preferred Alternative and future actions which are expected to continue rebuilding and strive to maintain sustainable stocks, should yield positive non-significant impacts to managed resources in the long term. In addition, the cumulative~~

~~impacts of FW 26 to the Scallop FMP on groundfish species are likely negligible and potentially positive for windowpane flounder.~~

~~Non-Target Species~~

~~As noted in Table 81, the combined impacts of past federal fishery management actions have decreased fishing effort and improved habitat protection for non-target species. Current management measures, including those implemented through Amendment 16 to the FMP, are expected to continue to control effort, and decrease bycatch and discards. The action proposed by Framework 52 is expected to continue this trend. The primary mechanism is through the reduced ABCs/ACLs (reduced from recent years). The modifications in management measures are not expected to affect non-target species. The past and present impacts, combined with the Preferred Alternative and future actions which are expected to continue rebuilding and strive to maintain sustainable stocks, should yield positive non-significant impacts to non-target species.~~

~~Protected Resources~~

~~As noted in Table 81, the combined impacts of past federal fishery management actions have reduced fishing effort, and therefore reduced interactions with protected resources. Current management measures, including those implemented through Amendment 16 to the FMP, are expected to continue to control effort and catch, and therefore continue to lessen interactions with protected resources. The action proposed by Framework 52 is expected to continue this trend; however, as stocks rebuild to sustainable levels, future actions may lead to increased effort, which may increase potential interactions with protected species. The reductions in ABCs/ACLs may provide short-term benefits to protected resources as groundfish fishing effort will decline, but as stocks rebuild effort may increase. Changes to management measures are not expected to affect protected species. Overall, the combination of past, present, and future actions is expected to stabilize protected species interactions and lead to positive, non-significant cumulative impacts to protected species.~~

~~Habitat, Including EFH~~

~~As noted in Table 81, the combined impacts of past federal fishery management actions have reduced fishing effort, and therefore have been positive for habitat protection. In addition, better control of non-fishing activities has also been positive for habitat protection. However, both fishing and non-fishing activities continue to decrease habitat quality. The management measures are not expected to have substantial impacts on habitat or EFH. The reduced ABCs/ACLs may result in reduced groundfish fishing activity and provide some minor short-term benefits to habitat. Overall, the combination of past, present, and future actions is expected to reduce fishing effort and hence reduce damage to habitat, resulting in slightly positive, non-significant cumulative impacts. However, it is likely that fishing and non-fishing activities will continue to degrade habitat quality.~~

~~Human Communities~~

~~As noted in Table 81, the combined impacts of past federal fishery management actions have reduced effort, and therefore have curtailed fishing opportunities. Past and current management measures, including those implemented through Amendment 16 to the FMP and subsequent framework actions, will maintain effort and catch limit controls, which together with non-fishing impacts such as rising fuel costs have had significant negative short term economic impacts on human communities. Modifying the AMs for northern and windowpane flounder stocks will provide some benefits to groundfish fishing communities. However, this action alone is not expected to have significant socioeconomic impacts beyond what was anticipated in Amendment 16. In addition, the cumulative impacts of FW 26 to the~~

~~Scallop FMP on the groundfish fishery are likely to be negligible and potentially positive for the windowpane flounder fishery. Overall, the combination of past, present, and future actions is expected to enable a long term sustainable harvest of groundfish stocks, which should lead to a long term positive impact on fishing communities and economies.~~

8.0 Applicable Law

8.1 Magnuson-Stevens Fishery Conservation and Management Act

8.1.1 ~~Consistency with National Standards~~

~~Section 301 of the Magnuson-Stevens Act requires that regulations implementing any Fishery Management Plan or Amendment be consistent with the ten national standards listed below.~~

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

~~Amendment 16 to the Northeast Multispecies FMP adopted measures designed to end overfishing on the groundfish stocks that were subject to excessive fishing pressure at the time of its development. This action adjusts those measures in a way that is designed to maximize optimum yield while preventing overfishing and continuing rebuilding plans. For overfished fisheries, the Magnuson-Stevens Act defines optimum yield as the amount of fish which provides for rebuilding to a level consistent with producing the maximum sustainable yield from the fishery. The measures are designed to achieve the fishing mortality rates, and yields, necessary to rebuild the overfished stocks as well as to keep fishing mortality below overfishing levels for stocks that are not in a rebuilding program. The measures in Section 4.1 that modify the groundfish fishery AMs for northern and southern windowpane flounder implement and adjust programs to achieve desired mortality levels.~~

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

~~The Preferred Alternatives are based on the most recent estimates of stock status available for northern windowpane flounder and southern windowpane flounder. These estimates are mostly in the form of information provided by the Northeast Fisheries Science Center in the NE Groundfish 2012 Updates Integrated Peer Review Meeting. Additionally, the mortality limits were determined based on the scientific advice of the SSC, which recommends ABCs to the Council.~~

~~With respect to bycatch information, the action uses bycatch information from the most recent assessments. Bycatch data from observer reports, vessel logbooks, or other sources must be rigorously reviewed before conclusions can be drawn on the extent and amount of bycatch. While additional observer data has been collected since the most recent assessments were completed, it has not been analyzed or reviewed through the stock assessment process and thus cannot be used.~~

~~The economic analyses in this document are based primarily on landings, revenue, and effort information collected through the NMFS data collection systems used for this fishery.~~

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

~~The Preferred Alternatives manage each individual groundfish stock as a unit throughout its range. Management measures specifically designed for one stock are applied to the entire range of the stock. In addition, the groundfish complex as a whole is managed in close coordination. Management measures are designed and evaluated for their impact on the fishery as a whole.~~

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

~~The Preferred Alternatives do not discriminate between residents of different states. They are applied equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they do have different impacts on different participants. This is because of the differences in the distribution of fish and the varying stock levels in the complex. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks. Even if the measures are designed to treat all permit holders the same, the fact that fish stocks are not distributed evenly, and that individual vessels may target specific stocks, means that distributive impacts cannot be avoided.~~

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

~~The Preferred Alternatives are not expected to significantly reduce the efficiency of fishing vessels. These measures are considered practicable since they allow rebuilding of depleted groundfish stocks and have considered efficiency to the greatest extent possible. None of the measures in this action have economic allocation as their sole purpose; all are designed to contribute to the control of fishing mortality.~~

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

~~The primary effort controls used in this management plan - effort controls and sectors - allow each vessel operator to fish when and how it best suits his or her business. Vessels can make short or long trips, and can fish in any open area at any time of the year. The measures allow for the use of different gear, vessel size, and fishing practices. The specific measures adopted in this action do not reduce this flexibility.~~

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

~~While some of the measures used in the management plan, and proposed by this action, tend to increase costs, those measures are necessary for achieving the plan's objectives. As an example, measures that reduce the efficiency of fishing vessels, including specific gear requirements such as are proposed in the AMs for the groundfish fishery, tend to increase the costs of fishing vessels since fishing catches are reduced. These measures accomplish other goals, however, by allowing groundfish stocks to rebuild. The measures do not duplicate other regulatory efforts. Management of multispecies stocks in federal waters is not subject to coordinated regulation by any other management body. Absent Council action, a coordinated rebuilding effort to restore the health of the overfished stocks would not occur.~~

~~The Council considered the costs and benefits of a range of alternatives to achieve the goals and objectives of this FMP. It considered the costs to the industry of taking no action relative to adopting the measures herein. The expected benefits are greater in the long-term if stocks are rebuilt, though it is clear there are substantial short-term declines in revenue and possible increases in costs that can be expected.~~

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

~~Consistent with the requirements of the Magnuson-Stevens Act to prevent overfishing and rebuild overfished stocks, the Preferred Alternatives may restrict fishing activity through the implementation AMs for northern and southern windowpane flounder stocks. Analyses of the impacts of these measures show that landings and revenues are likely to decline for many participants in upcoming years due to the rebuilding programs in place for many stocks. In the short term, these declines will probably have negative impacts on fishing communities throughout the region, but particularly on those ports that rely heavily on groundfish. These declines are unavoidable given the M-S Act requirements to rebuild overfished stocks. The need to control fishing mortality means that catches cannot be as high as would likely occur with less stringent management measures.~~

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

~~Many measures adopted in Amendment 16 were designed to limit the discards of both groundfish and some other species, including the sector management program, and this action is expected to continue those benefits with no substantial changes.~~

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

~~Measures adopted in Amendment 16 were designed to improve safety in spite of low ACLs anticipated by subsequent actions in the near future. The flexibility inherent in sector management and the ability to use common pool DAS at any time are key elements of the measures that promoted safety. The Preferred Alternative, in conjunction with Amendment 16 measures, is the best option for achieving the necessary mortality reductions while having the least impact on vessel safety.~~

8.1.2 ~~Other M-SFCMA requirements~~

~~Section 303 (a) of FCMA contains 14 required provisions for FMPs. These are discussed below. It should be emphasized that the requirement is imposed on the FMP. In some cases noted below, the M-S Act requirements are met by information in the Northeast Multispecies FMP, as amended. Any fishery management plan that is prepared by any Council, or by the Secretary, with respect to any fishery, shall—~~

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

~~Foreign fishing is not allowed under this management plan or this action and so specific measures are not included to specify and control allowable foreign catch. The measures in this management plan are designed to prevent overfishing and rebuild overfished stocks. There is one international agreement that is germane to multispecies management. On December 20, 2010, the International Fisheries Clarification Act stipulated that the U.S./Canada Resource Sharing Understanding, implemented through Amendment 13, can be considered an international agreement for the purposes of setting ACLs. The proposed measures are consistent with that Understanding.~~

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

~~Amendment 16 included a thorough description of the multispecies fishery from 2001 through 2008, including the gears used, number of vessels, landings and revenues, and effort used in the fishery. This action provides a summary of that information and additional relevant information about the fishery in Section 6.5.~~

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

~~The present biological status of the fishery is described in Section 6.2. Likely future conditions of the resource are described 7.1.1.3. Impacts resulting from other measures in the management plan other than the measures included here can be found in Amendment 16. The maximum sustainable yield for each stock in the fishery is defined in Amendment 16 and optimum yield for the fishery is defined in Amendment 9.~~

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

~~U.S. fishing vessels are capable of, and expected to, harvest the optimum yield from this fishery as specified in Amendment 16 and Frameworks 44, 45, 47, 49, 50, and 61. U.S. processors are also expected to process the harvest of U.S. fishing vessels. None of the optimum yield from this fishery can be made available to foreign fishing.~~

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

~~Current reporting requirements for this fishery have been in effect since 1994 and were originally specified in Amendment 5. They were slightly modified in Amendments 13 and 16, and VMS requirements were adopted in FW 42. The requirements include Vessel Trip Reports (VTRs) that are submitted by each fishing vessel. Dealers are also required to submit reports on the purchases of regulated groundfish from permitted vessels. Current reporting requirements are detailed in 50 CFR 648.7.~~

~~consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting~~

~~*because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;*~~

~~Provisions in accordance with this requirement were implemented in earlier actions, and continue with this action. For common pool vessels, the carry-over of a small number of DAS is allowed from one fishing year to the next. If a fisherman is unable to use all of his DAS because of weather or other conditions, this measure allows his available fishing time to be used in the subsequent fishing year. Sectors will also be allowed to carry forward a small amount of ACE into the next fishing year. This will help sectors react should adverse weather interfere with harvesting the entire ACE before the end of the year. Neither of these practices requires consultation with the Coast Guard.~~

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

~~Essential fish habitat was defined for Atlantic wolffish in Amendment 16, and for all stocks in an earlier action. A summary of the EFH can be found in Section 6.1.5.~~

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

~~Scientific and research needs are not required for a framework adjustment. Current research needs are identified in Amendment 16.~~

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

~~Impacts of this framework on fishing communities directly affected by this action and adjacent areas can be found in Section 7.5.~~

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

~~Objective and measurable Status Determination Criteria for all species in the management plan are presented in Amendment 16, and have been updated in subsequent frameworks, most recently FW 48.~~

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

~~The Standardized Bycatch Reporting Methodology omnibus amendment was dismissed by the U.S. Court of Appeals for the District of Columbia Circuit in 2011 (No. 10-5299 Oceana, Inc. v. Gary F. Locke). That method no longer applies to this framework. None of the measures in this framework are expected to increase bycatch beyond what was considered in Amendment 16.~~

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

~~This management plan does not include a catch and release recreational fishery management program and thus does not address this requirement.~~

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

~~As noted above, the description of the commercial, recreational, and charter fishing sectors was fully developed in Amendment 16, and the commercial sector is updated and summarized in this document (Section 6.5).~~

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

~~This preferred alternative does not allocate harvest restrictions or stock benefits to the fishery. Such allocations were adopted in Amendment 16, while this action adjusts management measures for some stocks within the existing allocation structure.~~

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

~~The mechanism for establishing annual catch limits was adopted by Amendment 16. This action includes adjustments to measures to ensure accountability for northern and southern windowpane flounder stocks.~~

8.1.3 ~~EFH Assessment~~

~~This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.~~

~~8.1.3.1 Description of Action~~

~~The purpose of the Framework 52 (Northeast Multispecies FMP) Preferred Alternative is to adopt modifications to management measures that will incorporate new information relative to effective program administration that are necessary to achieve the fishing mortality targets required by Amendment 16.~~

~~In general, the activity described by this action, fishing for groundfish species, occurs off the New England and Mid-Atlantic coasts within the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, the maps of the distribution of EFH, and descriptions of the characteristics that comprise the EFH). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Council as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.~~

~~The Preferred Alternative is described in Section 4.0. The alternative includes the following general measure:~~

- ~~Revised northern and southern windowpane flounder AMs for the groundfish fishery~~

~~8.1.3.2 Assessing the Potential Adverse Impacts~~

~~Refer to the Habitat Impacts of the Alternatives (Section 7.2, summarized in Section 7.2.3) for a tabular look at the summary impacts of the Preferred Alternative. Nearly all measures are expected to have neutral impacts on habitat.~~

~~Measures with Potential Negative Effects on EFH~~

~~None of the measures have potential negative effects on EFH.~~

~~Measures with Potential Positive Effects on EFH~~

~~The measures have low positive effects with respect to EFH.~~

~~**Table 97- Summary of possible effects to EFH as a result of the Preferred Alternative**~~

	~~**Preferred Alternative**~~
~~**Possible negative impacts**~~	
~~**Neutral Impacts**~~	
~~**Possible Positive Impacts**~~	~~Revised northern and southern windowpane flounder AMs for the groundfish fishery~~
~~**Uncertain Impacts**~~	~~N/A~~

~~8.1.3.3 Minimizing or Mitigating Adverse Impacts~~

~~Section 7.2, (habitat impacts of the alternatives) demonstrates that the overall habitat impacts of all the measures combined in this action have neutral impacts relative to the baseline habitat protections established under Amendment 13 to the Northeast Multispecies FMP. As such, additional measures to mitigate or minimize adverse effects of the multispecies fishery on EFH beyond those established under Amendment 13 are not necessary.~~

~~8.1.3.4 Conclusions~~

~~The Preferred Alternative is unlikely to have noticeable impacts on EFH; there may be low positive benefits when compared to the other alternatives.~~

8.2 National Environmental Policy Act (NEPA)

~~NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the M-S Act and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its agency policy and procedures for NEPA in NAO 216-6 §5.04b.1. All of those requirements are addressed in this document, as referenced below.~~

8.2.1 ~~Environmental Assessment~~

~~The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b) and NAO 216-6 §5.04b.1. They are included in this document as follows:~~

- ~~The need for this action are described in Section 3.2;~~
- ~~The alternatives that were considered are described in Section 4.0;~~
- ~~The environmental impacts of alternatives are described in Section 7.0;~~
- ~~The agencies and persons consulted on this action are listed in Section 8.2.3 and Section 8.2.4.~~

~~This document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).~~

- ~~An Executive Summary can be found in Section 1.0.~~
- ~~A Table of Contents can be found in Section 2.0.~~
- ~~Background and purpose are described in Section 3.0.~~
- ~~A summary of the document can be found in Section 1.0.~~
- ~~A brief description of the affected environment is in Section 6.0.~~
- ~~Cumulative impacts of the Preferred Alternatives are described in Section 7.6.~~
- ~~A determination of significance is in Section 8.2.2.~~
- ~~A list of preparers is in Section 8.2.3.~~
- ~~The index is in Section~~

8.2.2 ~~Finding of No Significant Impact (FONSI)~~

~~National Oceanic and Atmospheric Administration Order (NAO) 216-6 (revised May 20, 1999) provides criteria for determining the significance of the impacts of a final fishery management action. These criteria are discussed below:~~

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

~~Response: The Preferred Alternatives cannot reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action. With respect to the target species in the Northeast~~

~~Multispecies fishery the Preferred Alternatives adopt management measures that are consistent with target fishing mortality rates that promote rebuilding and/or sustaining stock sizes.~~

~~(2) *Can the Preferred Alternatives reasonably be expected to jeopardize the sustainability of any non- target species?*~~

~~Response: For fishery resources that are caught incidental to groundfish fishing activity, there is no indication in the analyses that the alternatives will threaten sustainability. Since the fishery does not currently jeopardize non-target species it is not likely that these alternatives will change that status.~~

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

~~Response: The Preferred Alternatives cannot reasonably be expected to cause substantial damage to the oceans and coastal habitats and/or essential fish habitat. Analyses described in Section 7.2 indicate that only minor impacts are expected.~~

~~(4) *Can the Preferred Alternatives be reasonably expected to have a substantial adverse impact on public health or safety?*~~

~~Response: Nothing in the Proposed Action can be reasonably expected to have a substantial adverse impact on public health or safety. Measures adopted in Amendment 16 were designed to improve safety in spite of low ACLs anticipated by subsequent actions in the near term future. The flexibility inherent in sector management and the ability to use common pool DAS at any time are key elements of the measures that promoted safety. The Preferred Alternatives, in conjunction with Amendment 16 measures, are the best options for achieving the necessary mortality reductions while having the least impact on vessel safety.~~

~~(5) *Can the Preferred Alternatives reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*~~

~~Response: The Preferred Alternatives cannot be reasonably expected to adversely affect endangered or threatened species. As discussed in Section 7.3, these species are expected to have very minimal impacts from the minor changes in fishing effort that are proposed by this action.~~

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

~~Response: The Preferred Alternatives are not expected to have a substantial impact on biodiversity and/or ecosystem function with the affected area. The use of ACLs and AMs will tightly control catches of target and incidental regulated groundfish stocks. Catches of target and incidental catch species under this program will be consistent with the mortality targets of Amendment 16, and thus will not have a substantial impact on predator-prey relationships or biodiversity. Particular measures within this action will have no more than minimal adverse impacts to EFH. It is therefore reasonable to expect that there will not be substantial impact on biodiversity or ecosystem function.~~

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

Response~~: The Preferred Alternatives are designed to continue the groundfish rebuilding programs that were first adopted in Amendment 13 to the Northeast Multispecies Fishery Management Plan and modified in subsequent actions, including Amendment 16. The environmental assessment documents that no significant natural or physical effects will result from the implementation of the Preferred Alternative. As described in Section 7.1.1, the AMs in this action are designed to continue rebuilding/ promote target catch levels. The action cannot be reasonably expected to have significant impacts on habitat or protected species, as the impacts are expected to fall within the range of those resulting from Amendments 13 and 16. The action's potential economic and social impacts are also addressed in the environmental assessment (Sections 7.4 and 7.5), as well as in the Executive Order 12866 review (Section 8.11.1) and the Initial Regulatory Flexibility Act review (Section 8.11.2).~~

~~NMFS has determined that despite the potential socio-economic impacts resulting from this action, there is no need to prepare an EIS. The purpose of NEPA is to protect the environment by requiring Federal agencies to consider the impacts of their proposed actions on the human environment, defined as " the natural and physical environment and the relationship of the people with that environment." The EA for FW 52 describes and analyzes the preferred alternatives and concludes that there will be no significant impacts to the natural and physical environment. While some fishermen, shore-side businesses, and others may experience impacts to their livelihood, these impacts, in and of themselves, do not require the preparation of an EIS, as supported by NEPA's implementing regulations at 40 C.F.R. 1508.14. Consequently, because the EA demonstrates that the action's potential natural and physical impacts are not significant, the execution of a FONSI remains appropriate under this criteria.~~

~~The Proposed Action is not predicted to have an adverse impact on fishing vessels, purchasers of seafood products, ports, recreational anglers, and operators of party/charter businesses. This action proposes to implement Option 2 and/or Option 3, with agency discretion for the final implementation. Both Options are predicted to have positive economic impacts relative to No Action. AMs resulting in gear restrictions in the small AM areas affect $6.3 mil less revenues on groundfish trips in the Northern area, and $4.1mil less in the Southern area, than the two large areas, implying that the costs associated with the gear-restricted area – redirection of fishing effort, higher operational costs, lower catch rates, different species composition – will be much lower under the proposed action than the No Action option. Overall, the economic impacts of the proposed action are predicted to be positive.~~

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

Response~~: The effect of the Preferred Alternatives on the quality of human environment is not expected to be highly controversial in the context of NEPA. Alternatives in this document that modify AMs are expected to improve the ability to achieve mortality targets while minimizing economic impacts to fishing communities and fishermen so that society reaps benefits from fishery resources.~~

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

Response~~: No, the Preferred Alternatives cannot be reasonably expected to result in substantial impacts to unique areas or ecological critical areas. The only designated HAPC in the areas affected by this action is protected by an existing closed area that would not be affected by this action. In addition, vessel operations around the unique historical and cultural resources encompassed by the Stellwagen Bank National Marine Sanctuary would not likely be altered by this action. As a result, no substantial impacts are expected from this action.~~

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

~~Response: The Preferred Alternatives are not expected to result in highly uncertain effects on the human environment or involve unique or unknown risks. The measures used in this action are similar to those adopted in past management actions, and these prior actions have reduced fishing mortality on many stocks. While there is a degree of uncertainty over how fishermen will react to the proposed measures, the analytic tools used to evaluate the measures attempt to take that uncertainty into account and reflect the likely results as a range of possible outcomes. For example, the economic analysis in Section 7.4 illustrates the distribution of results that are expected rather than provide only a point estimate. Overall, the impacts of the Preferred Alternatives can be, and are, described with a relative amount of certainty. Overall, the economic impacts of the proposed action are predicted to be positive.~~

~~(11) *Is the Preferred Alternative related to other actions with individually insignificant, but cumulatively significant impacts?*~~

~~Response: The Proposed Action is not related to other actions with individually insignificant but cumulatively significant impacts. Recent management actions in this fishery include FW 42, FW 43, Amendment 16, FW 44, FW 45, FW 46, FW 47, FW 48, FW 49, FW 50, and FW 51. FW 42 developed specific measures implementing programs adopted by Amendment 13; each was determined to be insignificant. FW 43 adopted limits on groundfish bycatch by mid-water trawl herring vessels and was not determined to have a significant effect on either the groundfish or herring fisheries. Amendment 16 had significant impacts and thus required the preparation of an EIS, while Frameworks 44 and 46 set specifications as required under Amendment 16 and made relatively minor adjustments to the sector administration program. Framework 46 modified the amount of haddock that may be caught by the midwater herring fishery. Framework 47 adjusted several ABCs/ACLs for FY 2012, FW 48 modified many of the ABC/ACL provisions, AMS, and monitoring provisions, and FW 49 adjusted the timing of scallop vessel access to access areas on GB. Framework 50 adjusted ABCs/ACLs for FY 2013. Framework 51 adjusted ABCs/ACLs for FY 204 and changes management measures. The measures in this action were anticipated by Amendment 16 and thus cannot be said to have different cumulative impacts that were not foreseen and addressed in the amendment. Therefore, the Preferred Alternative, when assessed in conjunction with the actions noted above, would not have significant impacts on the natural or physical environment.~~

~~(12) *Are the Preferred Alternatives likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or destruction of significant scientific, cultural or historical resources?*~~

~~Response: The Preferred Alternatives are not likely to affect objects listed in the National Register of Historic Places or cause significant impact to scientific, cultural, or historical resources. The only objects in the fishery area that are listed in the National Register of Historic Places are ship wrecks, including several in the Stellwagen Bank National Marine Sanctuary. The current regulations allow fishing within the Stellwagen Bank National Marine Sanctuary. The Preferred Alternative would not regulate current fishing practices within the sanctuary. However, vessels typically avoid fishing near wrecks to avoid tangling gear. Therefore, this action would not result in any adverse effects to wrecks.~~

~~(13) *Can the Preferred Alternatives reasonably be expected to result in the introduction or spread of a non-indigenous species?*~~

~~Response: This action would not result in the introduction or spread of any non-indigenous species, as it would not result in any vessel activity outside of the Northeast region.~~

~~(14) *Are the Preferred Alternatives likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration*?~~

~~Response: No, the Preferred Alternatives are not likely to establish precedent for future actions with significant effects. The Preferred Alternatives adopt measures that are designed to react to the necessity to reduce fishing mortality for several groundfish stocks in order to achieve the fishing mortality targets adopted by Amendment 16 and subsequent framework actions. As such, these measures are designed to address a specific problem and are not intended to represent a decision about future management actions that may adopt different measures.~~

~~(15) *Can the Preferred Alternatives reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment*?~~

~~Response: The Preferred Alternatives are intended to implement measures that would offer further protection of marine resources and would not threaten a violation of Federal, state, or local law or requirements to protect the environment.~~

~~(16) *Can the Preferred Alternatives reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?*~~

~~Response: As specified in the responses to the first two criteria of this section, the Preferred Alternatives are not expected to result in cumulative adverse effects that would have a substantial effect on target or non-target species. This action would maintain fishing mortality within M-S Act requirements for several groundfish stocks, with no expected increase in mortality for non-target and non-groundfish stocks.~~

~~FONSI STATEMENT~~:

~~In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Framework Adjustment 52 to the Northeast Multispecies Fishery Management Plan, it is hereby determined that Framework Adjustment 52 will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not required.~~

~~Regional Administrator,~~ ~~Greater Atlantic Regional Fisheries Office, NOAA~~	~~Date~~

8.2.3 ~~List of Preparers; Point of Contact~~

~~Questions concerning this document may be addressed to:~~

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~~Sally Sherman, Maine Department of Marine Resources~~
~~Michael Ruccio (GARFO)~~
~~Dr. William Whitmore (GARFO)~~

8.2.4 ~~Agencies Consulted~~

~~The following agencies were consulted in the preparation of this document:~~

- ~~Mid-Atlantic Fishery Management Council~~
- ~~New England Fishery Management Council, which includes representatives from the following additional organizations:~~
  - ~~Connecticut Department of Environmental Protection~~
  - ~~Rhode Island Department of Environmental Management~~
  - ~~Massachusetts Division of Marine Fisheries~~
  - ~~New Hampshire Fish and Game~~
  - ~~Maine Department of Marine Resources~~
- ~~National Marine Fisheries Service, NOAA, Department of Commerce~~
- ~~United States Coast Guard, Department of Homeland Security~~

8.2.5 ~~Opportunity for Public Comment~~

~~The Preferred Alternatives were developed during the period February 2014 through June 2014 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.~~

~~Date~~	~~Meeting Type~~	~~Location~~
~~2/25-26/14~~	~~Council Meeting~~	~~DoubleTree Hilton, Danvers, MA~~
~~3/28/14~~	~~Groundfish Oversight Committee~~	~~Omni Providence, Providence, RI~~
~~4/1/14~~	~~Groundfish Advisory Panel~~	~~Sheraton Colonial, Wakefield, MA~~
~~4/5/14~~	~~Groundfish Oversight Committee~~	~~Sheraton Colonial, Wakefield, MA~~
~~6/9/14~~	~~Groundfish Oversight Committee~~	~~Hampton Inn & Suites, Providence, RI~~
~~6/17-19/14~~	~~Council Meeting~~	~~Holiday Inn by the Bay, Portland, ME~~

8.3 Endangered Species Act

~~Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the multispecies fishery is not likely to jeopardize any ESA- listed species or alter or modify any critical habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 16 Environmental Impact Statement.~~

~~The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when compared to the prosecution of the fishery prior to implementation of Amendment 16. The NEFMC is now seeking the concurrence of the National Marine Fisheries Service with respect to Framework Adjustment 52.~~

~~For further information on the potential impacts of the fishery and the proposed management action on listed species, see Section 7.3 of this document.~~

8.4 Marine Mammal Protection Act

~~The NEFMC has reviewed the impacts of the Preferred Alternatives on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although they are likely to affect species inhabiting the multispecies management unit, the measures will not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP.~~

~~For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section 7.3 of this document.~~

8.5 Coastal Zone Management Act

~~Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to Section 930.36(c) of the regulations implementing the Coastal Zone Management Act, NMFS made a general consistency determination that the Northeast Multispecies Fishery Management Plan (FMP), including Amendment 16, and Framework Adjustment 47, is consistent to the maximum extent practicable with the enforceable policies of the approved coastal management program of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. This general consistency determination applies to the current NE Multispecies Fishery Management Plan (FMP), and all subsequent routine federal actions carried out in accordance with the FMP such as Framework Adjustments and specifications. A general consistency determination is warranted because Framework Adjustments to the FMP are repeated activities that adjust the use of management tools previously implemented in the FMP. A general consistency determination avoids the necessity of issuing separate consistency determinations for each incremental action. This determination was submitted to the above states on October 21, 2009. To date, the states of North Carolina, Rhode Island, Virginia, Connecticut, New Hampshire, and Pennsylvania have concurred with the General Consistency Determination. Consistency was inferred for those states that did not respond.~~

8.6 Administrative Procedure Act

~~This action was developed in compliance with the requirements of the Administrative Procedure Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by federal agencies. The purpose of these requirements is to ensure public access to the federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.~~

8.7 Data Quality Act

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

8.7.1 ~~Utility of Information Product~~

~~The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the Preferred Alternatives on, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the Preferred Alternatives is included so that intended users may have a full understanding of the Preferred Alternatives and its implications.~~

~~Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-~~

~~stage public process. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NOAA Fisheries Service.~~

~~This document is available in several formats, including printed publication, CD-ROM, and online through the Council's web page in PDF format. The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Northeast Regional Office, and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.~~

8.7.2 ~~Integrity of Information Product~~

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

8.7.3 ~~Objectivity of Information Product~~

~~For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.~~

~~This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. These update assessments were reviewed by the SAW 54 (NEFSC 2012), the NE Groundfish 2012 Updates Integrated Peer Review Meeting (NEFSC 2012), and SAW 55 (NEFSC 2013) which all included participation by independent stock assessment scientists. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish Plan Development Team/Monitoring Committee.~~

~~Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Preferred Alternative were conducted using information from the most recent complete calendar years, through 2012, and in some cases includes information that was collected during the first eight~~

~~months of calendar year 2013. Complete data were not available for calendar year 2014. The data used in the analyses provide the best available information on the number of harvesters in the fishery, the catch (including landings and discards) by those harvesters, the sales and revenue of those landings to dealers, the type of permits held by vessels, the number of DAS used by those vessels, the catch of recreational fishermen and the location of those catches, and the catches and revenues from various special management programs. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the groundfish fishery.~~

~~The policy choices are clearly articulated, in Section 4.0 of this document, as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in Section 7.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.~~

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

8.8 Executive Order 13132 (Federalism)

~~This E.O. established nine fundamental federalism principles for federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in FW 52. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.~~

8.9 Executive Order 13158 (Marine Protected Areas)

~~The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.~~

8.10 Paperwork Reduction Act

~~The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.~~

~~FW 52 does not modify existing collection of information requirements implemented by previous amendments to the FMP that are subject to the PRA, including:~~

- ~~Reporting requirements for SAPs and the Category B (regular) DAS Program;~~
- ~~Mandatory use of a Vessel Monitoring System (VMS) by all vessels using a groundfish DAS;~~
- ~~Changes to possession limits, which will change the requirements to notify NMFS of plans to fish in certain areas; and~~
- ~~Provisions to allow vessel operators to notify NMFS of plans to fish both inside and outside the Eastern U.S./CA area on the same fishing trip.~~

8.11 Regulatory Impact Review

8.11.1 ~~Executive Order 12866~~

~~The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section 8.11 of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action in accordance with the guidelines established by E.O. 12866. The analysis included in the RIR shows that this action is not a "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy.~~

~~E.O. 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant action is any regulatory action that may:~~

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

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

~~3* Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or~~

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

~~8.11.1.1 Objectives~~

~~The goals and objectives of Framework Adjustment 52 derive from those detailed in Amendment 16 to the Northeast Multispecies Fishery FMP and are as follows:~~

~~**Goal 1**: Consistent with the National Standards and other required provisions of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law, manage the northeast multispecies complex at sustainable levels.~~

~~**Goal 2**: Create a management system so that fleet capacity will be commensurate with resource status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery.~~

~~**Goal 3**: Maintain a directed commercial and recreational fishery for northeast multispecies.~~

~~**Goal 4**: Minimize, to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure.~~

~~**Goal 5**: Provide reasonable and regulated access to the groundfish species covered in this plan to all members of the public of the United States for seafood consumption and recreational purposes during the stock rebuilding period without compromising the Amendment 13 objectives or timetable. If necessary, management measures could be modified in the future to insure that the overall plan objectives are met.~~

~~**Goal 6**: To promote stewardship within the fishery.~~

~~**Objective 1**: Achieve, on a continuing basis, optimum yield (OY) for the U.S. fishing industry.~~

~~**Objective 2**: Clarify the status determination criteria (biological reference points and control rules) for groundfish stocks so they are consistent with the National Standard guidelines and applicable law.~~

~~**Objective 3**: Adopt fishery management measures that constrain fishing mortality to levels that are compliant with the Sustainable Fisheries Act.~~

~~**Objective 4**: Implement rebuilding schedules for overfished stocks, and prevent overfishing.~~

~~**Objective 5**: Adopt measures as appropriate to support international trans-boundary management of resources.~~

~~**Objective 6**: Promote research and improve the collection of information to better understand groundfish population dynamics, biology and ecology, and to improve assessment procedures in cooperation with the industry.~~

~~**Objective 7**: To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation.~~

~~**Objective 8**: Develop biological, economic and social measures of success for the groundfish fishery and resource that insure accountability in achieving fishery management objectives.~~

~~**Objective 9**: Adopt measures consistent with the habitat provisions of the M-S Act, including identification of EFH and minimizing impacts on habitat to the extent practicable.~~

~~**Objective 10**: Identify and minimize bycatch, which include regulatory discards, to the extent practicable, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.~~

~~8.11.1.2 Description~~

~~A description of the entities affected by this Framework Adjustment, specifically the stakeholders of the New England Groundfish Fishery, is provided in Section 6.5.1 of this document.~~

~~8.11.1.3 Problem Statement~~

~~The need and purpose of the actions proposed in this Framework Adjustment are set forth in Section 3.2 of this document and are incorporated herein by reference.~~

~~8.11.1.4 Analysis of Alternatives~~

~~This section provides an analysis of each proposed alternative of FW52 as mandated by EO 12866. The focus will be on the expected changes (1) in net benefits and costs to stakeholders of the New England Groundfish Fishery, (2) changes to the distribution of benefits and costs within the industry, (3) changes in income and employment, (4) cumulative impacts of the regulation, and (5) changes in other social concerns. Much of this information is captured already in the detailed economic impacts and social~~

~~impacts analyses of Sections 7.4 and 7.5 of this document. This RIR will summarize and highlight the major findings of the economic impacts analysis provided in section 7.4 of this document, as mandated by EO 12866. For social impacts of each alternative, see Section 7.5.~~

~~When assessing benefits and costs of the regulations, it is important to note that the analysis will focus on the producer surplus generated by impacted fishing businesses. Consumer surplus is not expected to be affected by any of the regulatory changes proposed in FW52, as these regulations are unlikely to affect consumer welfare due to substitutes and imports.~~

~~8.11.1.4.1 Commercial and Recreational Fishery Measures~~

~~8.11.1.4.1.1 Accountability Measures~~

~~A detailed description of this alternative can be found in Section 4.2.1 of this document.~~

~~8.11.1.4.1.1.1 Option 1: No Action~~

~~Option 1/No Action would result in no additional economic impacts over the status quo. However the status quo has potential negative impacts should AM areas be triggered. The economic impacts of triggering the AM areas are a function of (1) differences in profitability within the AM area between using selective vs. traditional gears, and/or (2) differences in profitability using selective gears inside vs. outside the AM area. Profitability itself is a function of costs and revenues, as well as species-specific resource availability. The AM areas could have net negative economic impacts if they result in:~~

- ~~lower stock-specific aggregate catches, due to lack of species availability outside of the AM area during the year with gear restrictions in place;~~
- ~~higher variable costs due to lower catch rates for economically important stocks either inside the AM area(s) when using selective gears, or outside the AM area(s) when using traditional gears;~~
- ~~higher gear costs associated with rigging and using selective gears.~~

~~Economic impacts of the No Action option are evaluated for large and small AMs within each stock area. Additional details and summary tables may be found in Section 7.4 of this document.~~

~~Northern Windowpane Flounder AM – LARGE~~
~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the northern windowpane large AM area is nearly $10.6 million dollars, accounting for 9% of total revenues. Over $8 million dollars of total revenues are from trips fishing with traditional trawl gear, which would no longer be allowed in this area if the AM is adopted and implemented.. These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected by this option, as vessels may still elect to fish inside this area with selective gear or increase their fishing efforts outside this area.~~

~~Northern Windowpane Flounder AM – SMALL~~
~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the northern windowpane small AM area is nearly $4.3 million dollars, accounting for 4% of total revenues. Over $3.5 million dollars of total revenues are from trips fishing with traditional trawl gear, which would no longer be allowed in this area if the AM is adopted and implemented. These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected as vessels will elect to either fish inside this area with selective gear or increase their fishing efforts outside this area.~~

~~Southern Windowpane Flounder AM – LARGE AREA 1~~

~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the southern windowpane flounder large AM area 1 is over $5.7 million dollars, accounting for 5% of total revenues. Over $4.2 million dollars of total revenues are from trips fishing with traditional trawl gear, which would no longer be allowed in this area if the AM is adopted and implemented. These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected as vessels will most likely elect to increase their fishing efforts outside this area. In this case, even if revenues remain the same, vessel costs will rise due to longer steam time, decreased catch per unit effort, or both.~~

~~Southern Windowpane Flounder AM - LARGE AREA 2~~

~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the southern windowpane flounder large AM area 2 is over $1.6 million dollars, accounting for 1% of total revenues. Over 99% of this revenue is from trips fishing with traditional trawl gear, which would no longer be allowed in this area if the AM is adopted and implemented. These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected as vessels will most likely elect to increase their fishing efforts outside this area. In this case, even if revenues remain the same, vessel costs will rise due to longer steam time, decreased catch per unit effort, or both.~~

~~Southern Windowpane Flounder AM – SMALL~~

~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the southern windowpane flounder small area is over $1.4 million dollars, accounting for 1% of total revenues. Over $1 million dollars of total revenues are from trips fishing with traditional trawl gear, which would no longer be allowed in this area if the AM is adopted and implemented. These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected as vessels will most likely elect to increase their fishing efforts outside this area. In this case, even if revenues remain the same, vessel costs will rise due to longer steam time, decreased catch per unit effort, or both.~~

~~Summary of Economic Impacts of the No Action Option~~

~~In summary, as previously analyzed in FW47 and updated here, the No Action Alternative of implementing the small northern windowpane flounder AM area may have a maximum upper bound cost of $3.5 million in groundfish revenue; while the larger area could affect $8.2 million in revenue. Implementing the small southern windowpane flounder AM area may have a maximum upper bound cost of $1 million in groundfish revenue; while the larger southern areas (1 and 2) could affect $5.8 million in revenue. Not all of these revenues are foregone, as fishermen can choose to fish inside the areas with selective gear or could fish in other areas. Whether it will be more profitable to fish in other areas or to continue fishing inside these areas with selective gears depends on the profitability of other fishing options. Given the relatively small size of most of the small AM areas, the additional trip costs (steaming time, etc.) are likely to be small. This does not necessarily hold for the Large AM areas, where changes in catch composition between selective and traditional gears, combined with species-level availability outside the areas, could mean a reduction in total catch for affected vessels and, by extension, ports. Even if revenues remain the same, or increase, post-AM areas, costs associated with additional steam time and reduced catchability will mean that profits will be lower as a result of these measures. It is difficult to quantitatively predict the magnitude of the losses, conditioned on the upper bounds previously reported.~~

~~Application of the No Action Alternative in FY2014~~

~~Since FW47, these AMs have not been triggered for the groundfish fishery. However, the large AMs for both stock areas were implemented for FY2014. Option 1/No Action will have negative economic impacts, because it will actually affect fishing behavior and the AM applies to both common pool and~~

~~sector vessels fishing on a groundfish trip fishing with trawl gear. At a minimum, fishermen will have to alter their behavior, which may impose additional costs. At a maximum, it could reduce revenue by $14 million, since the larger areas have been implemented simultaneously. The maximum possible economic impacts of Option 1/No Action are expected to be more negative than may occur with Option 2. For the northern windowpane flounder areas, the economic impacts are expected to be less negative than may occur with Option 3. The No Action alternative would result in no additional impacts over the status quo.~~

~~8.11.1.4.1.1.2 Option 2: Area-Based Accountability Measure for Windowpane Flounder - Modified accountability measure trigger that incorporates stock status and biomass (Preferred Alternative)~~

~~The AM areas in Option 2 are identical to those in Option 1/No Action, therefore the range of potential economic impacts are the same as those discussed in Section 7.4.1.1. Thus, comparing economic impacts between Option 1/No Action and Option 2 depends on the likelihood of triggering the AM. The potential reduction in size of the AM area decreases the likelihood of triggering the large AM areas, decreasing the probability of incurring the full magnitude of the economic impacts. The economic impacts of Option 2 are likely positive relative to Option 1/No Action and Option 4, though triggering the small area would have negative impacts.~~

~~8.11.1.4.1.1.3 Option 3: Area-Based Accountability Measure for Windowpane Flounder - Consideration of catch performance over the most recent two-year period when determining accountability measure implementation. (Preferred Alternative)~~

~~The AM Areas in Option 3 are identical to those in Option 1/No Action, therefore the range of potential economic impacts are the same as those discussed in Section 7.4.1.1. Thus, comparing economic impacts between Option 1/No Action and Option 3 depends, on the likelihood of triggering the AM. The potential removal of the AM in Year 3 decreases the probability of incurring the full magnitude of the economic impacts. The economic impacts of Option 3 are likely to be less negative than would occur with Option 1/No Action and Option 4. Relative to Option 2, the economic impacts of Option 3 would be positive.~~

~~8.11.1.4.1.1.4 Option 4: Seasonal accountability measure for northern windowpane flounder stock~~

~~The economic impacts of triggering the AM areas are a function of (1) differences in profitability within the AM area between using selective vs. traditional gears, and/or (2) differences in profitability using selective gears inside vs. outside the AM area. Profitability itself is a function of costs and revenues, as well as species-specific resource availability. The AM areas could have net negative economic impacts if they result in:~~

- ~~lower stock-specific aggregate catches, due to lack of species availability outside of the AM area during the year with gear-restrictions in place;~~
- ~~higher variable costs due to lower catch rates for economically important stocks either inside the AM area when using selective gears, or outside the AM area when using traditional gears;~~
- ~~higher gear costs associated with rigging and using selective gears.~~

~~Whether it will be more profitable to fish in other areas or to continue fishing inside these areas with selective gears depends on the profitability of other fishing options. The use of selective gear can potentially change the composition of the catch inside the AM area, likely resulting in a lower proportion of flatfish relative to traditional trawl gears.~~

~~Northern Windowpane Flounder Seasonal AM - SHORT (May 1- August 31)~~

~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the northern windowpane flounder short seasonal AM area is over $7 million dollars, accounting for 6% of total revenues (Table 21). Over $7 million dollars of total revenues are from trips fishing with traditional trawl gear which would no longer be allowed in this area if the AM is adopted and implemented (Table 21). These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected by this option, as vessels may still elect to fish inside this area with selective gear or increase their fishing efforts outside this area.~~

~~Northern Windowpane Flounder Seasonal AM – LONG (May 1- December 31)~~
~~The average annual revenue (FY10-12) by groundfish fishing vessels estimated from trips in the northern windowpane long seasonal AM area is over $13 million dollars, accounting for 11% of total revenues (Table 25). Over 96% of total revenues are from trips fishing with traditional trawl gear, which would no longer be allowed in this area if the AM is adopted and implemented (Table 25). These revenues represent the upper bound cost associated with this option. It is, however, likely that only a portion of these revenues will be affected by this option, as vessels may still elect to fish inside this area with selective gear or increase their fishing efforts outside this area.~~

~~Summary~~
~~In summary, implementing the short seasonal northern windowpane flounder AM area (May 1-August 31) may have a maximum upper bound cost of $7.3 million in groundfish revenue; while the longer seasonal gear-restricted area (May 1-December 31) could affect $13.2 million in revenue. Not all of these revenues are foregone, as fishermen can choose to fish inside the areas with selective gear or could fish in other areas. Whether it will be more profitable to fish in other areas or to continue fishing inside these areas with selective gears depends on the profitability of other fishing options. Given the relatively large size of the seasonal AM area, the additional trip costs (steaming time, etc.) are likely to be substantial. Changes in catch composition between selective and traditional gears, combined with species-level availability outside the areas, could mean a reduction in total catch for affected vessels and, by extension, ports. Even if revenues remain the same, or increase, post-AM areas, costs associated with additional steam time and reduced catchability could result in lower profits as a result of Option 4. It is difficult to quantitatively predict the magnitude of the losses, conditioned on the upper bounds previously reported.~~

~~The economic impacts of Option 3 are likely to be more negative than would occur with Option 1/No Action or Option 2, since a broader range of revenues maybe affected.~~

~~8.11.1.5 Determination of Significance~~

~~The Proposed Action is not predicted to have an adverse impact on fishing vessels, purchasers of seafood products, ports, recreational anglers, and operators of party/charter businesses in excess of $100 million. This action proposes to implement Options 2 and 3, with agency discretion for the final implementation. Both Options are predicted to have positive economic impacts relative to No Action. AMs resulting in a gear restriction in the small AM areas affect $6.3mil less revenues on groundfish trips in the Northern area, and $4.1mil less in the Southern area, than the two large areas, implying that the costs associated with the gear restricted areas – redirection of fishing effort, higher operational costs, lower catch rates, different species composition – will be much lower under the proposed action than the No Action option. Overall, the economic impacts of the proposed action are predicted to be positive.~~

8.11.2 ~~Initial Regulatory Flexibility Act~~

~~8.11.2.1 Introduction~~

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

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

~~8.11.2.2 Description of reasons why action by the Agency is being considered~~

~~The need and purpose of the actions are set forth in Section 3.2 of this document and are incorporated herein by reference.~~

~~8.11.2.3 Statement of the objectives of, and legal basis for, the proposed rule~~

~~The goals and objectives of Framework Adjustment 52 are the same as those detailed in Amendment 16 to the Northeast Multispecies Fishery FMP. In general, FW 52 is intended to modify groundfish fishery accountability measures for the northern and southern windowpane flounder stocks.~~

~~8.11.2.4 Description and estimate of the number of small entities to which the proposed rule will apply~~

~~Small entities include "small businesses," "small organizations," and "small governmental jurisdictions." The Small Business Administration (SBA) has established size standards for all major industry sectors in the U.S. including commercial finfish harvesters (NAICS code 114111), commercial shellfish harvesters (NAICS code 114112), other commercial marine harvesters (NAICS code 114119), for-hire businesses (NAICS code 487210), marinas (NAICS code 713930), seafood dealers/wholesalers (NAICS code 424460), and seafood processors (NAICS code 311710). A business primarily involved in finfish harvesting is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $20.5~~

~~million for all its affiliated operations worldwide. For commercial shellfish harvesters, the other qualifiers apply and the receipts threshold is $5.5 million. For other commercial marine harvesters, for-hire businesses, and marinas, the other qualifiers apply and the receipts threshold is $7.5 million. A business primarily involved in seafood processing is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual employment, counting all individuals employed on a full-time, part-time, or other basis not in excess of 500 employees[22] for all its affiliated operations worldwide. For seafood dealers/wholesalers, the other qualifiers apply and the employment threshold is 100 employees. A small organization is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. Small governmental jurisdictions are governments of cities, boroughs, counties, towns, townships, villages, school districts, or special districts, with population of fewer than 50,000.~~

~~This proposed action impacts commercial fish harvesting entities engaged in the Northeast multispecies limited access fishery. A description of the specific permits that are likely to be impacted is included below for informational purposes, followed by a discussion of the impacted businesses (ownership entities) which can include multiple vessels and/or permit types. For the purposes of the RFA analysis, the ownership entities, not the individual vessels, are considered to be the regulated entities.~~

~~Regulated Commercial Fish Harvesting Entities~~

~~Limited Access Northeast Multispecies harvesting permits~~

~~The limited access groundfish[23] fisheries are further sub-classified as those enrolled in the sector allocation program and those in the common pool. Sector vessels are subject to sector-level stock-specific Annual Catch Entitlements (ACE) that limit catch of allocated groundfish stocks. Accountability measures (AMs) include a prohibition on fishing inside designated areas once 100 percent of available Sector ACE has been caught, as well as area-based gear and effort restrictions that are triggered when catch of non-allocated groundfish stocks exceed Allowable Catch Limits (ACLs). Common pool vessels are subject to various Days-at-sea and trip limits designed to keep catches below ACLs set for vessels enrolled in this program. In general, sector-enrolled businesses rely more heavily on sales of groundfish species than common pool-enrolled vessels. All limited access multispecies permit holders are eligible to participate in the sector allocation program, however many permit holders select to remain in the common pool fishery as a result of low catch histories and in turn, low Potential Sector Contributions (PSC) for groundfish stocks.~~

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

[23] The species managed under the Northeast multispecies FMP are commonly referred to as groundfish.

~~As of May 1, 2014 (beginning of fishing year 2014) there were 1,046 individual limited access permits~~[24]~~. 613 of these permits were enrolled in the sector program and 433 were in the common pool. Of these 1,046 limited access multispecies permits, 767 had landings of any species and 414 had groundfish landings in FY 2013.~~

~~Ownership entities in regulated fish harvesting businesses~~

~~Individually-permitted vessels may hold permits for several fisheries, harvesting species of fish that are regulated by several different fishery management plans, even beyond those impacted by the proposed action. Furthermore, multiple permitted vessels and/or permits may be owned by entities affiliated by stock ownership, common management, identity of interest, contractual relationships or economic dependency. For the purposes of this analysis, ownership entities are defined by those entities with common ownership personnel as listed on permit application documentation. Only permits with identical ownership personnel are categorized as an ownership entity. For example, if five permits have the same seven personnel listed as co-owners on their application paperwork, those seven personnel form one ownership entity, covering those five permits. If one or several of the seven owners also own additional vessels, with sub-sets of the original seven personnel or with new co-owners, those ownership arrangements are deemed to be separate ownership entities for the purpose of this analysis.~~

~~A summary of regulated ownership entities within potentially impacted fisheries~~

~~Ownership entities are identified on June 1st of each year based on the list of all permit numbers, for the most recent complete calendar year, that have applied for any type of Northeast Federal fishing permit. The current ownership data set is based on calendar year 2013 permits and contains average gross sales associated with those permits for calendar years 2011 through 2013.~~

~~Matching the potentially impacted permits described above (Fishing Year 2014) to the calendar year 2013 ownership data, results in 868 distinct ownership entities. Of these, 855 are categorized as small and 13 are categorized as large entities per the SBA guidelines (Tables 83 and 84).~~

~~These totals may mask some diversity among the entities. Many, if not most, of these ownership entities maintain diversified harvest portfolios, obtaining gross sales from many fisheries and not dependent on any one. However, not all are equally diversified. Those that depend most heavily on sales from harvesting species impacted directly by the proposed action are most likely to be affected. By defining dependence as deriving greater than 50% of gross sales from sales of regulated species associated with a specific fishery, we are able to identify those ownership groups most likely to be impacted by the proposed regulations~~[25]~~. Using this threshold, we find that 114 entities are groundfish-dependent, all of which are small and all of which are finfish commercial harvesting businesses (Table 85). Of the 114 groundfish-dependent entities, 102 have some level of participation in the sector program and 12 operate exclusively in the common pool.~~

[24] For purposes of this analysis, groundfish limited access eligibilities held as Confirmation of Permit History (CPH) are not included because although they may generate revenue from ACE leasing, they do not generate any gross sales from fishing activity and thus would not be classified as commercial fishing entities.

[25] Charter/party vessels are prohibited from selling fish though some ownership entities may have recreational and commercial permits. Entities designated as charter businesses derive the largest part of their gross sales from for-hire fees from passengers.

~~**Table 98- Description of regulated entities by business type and size**~~

~~**Business Type**~~	~~**Small**~~	~~**Large**~~	~~**Total**~~
~~Charter~~	~~39~~	~~0~~	~~39~~
~~Finfish~~	~~378~~	~~0~~	~~378~~
~~Shellfish~~	~~291~~	~~13~~	~~304~~
~~No Revenues~~	~~147~~	~~0~~	~~147~~
~~**Total**~~	~~**855**~~	~~**13**~~	~~**868**~~

~~* Business type is based on the fishing activity that generated the highest gross sales for each entity. Ownership entities with zero sales were defaulted into the finfish category.~~

~~**Table 99 - Description of regulated entities by gross sales**~~

~~**Sales**~~	~~**Number of entities**~~	~~**Number of large businesses**~~	~~**Average number of fishing permits owned per entity**~~	~~**Maximum fishing permits per entity**~~	~~**Median gross sales per entity**~~	~~**Mean gross sales per entity**~~
~~<$50K~~	~~268~~	~~0~~	~~1.2~~	~~36~~	~~$2,082~~	~~$9,740~~
~~$50-100K~~	~~96~~	~~0~~	~~1.1~~	~~2~~	~~$74,169~~	~~$74,710~~
~~$100-500K~~	~~323~~	~~0~~	~~1.3~~	~~5~~	~~$211,812~~	~~$236,344~~
~~$500K-1mil~~	~~78~~	~~0~~	~~1.4~~	~~5~~	~~$729,500~~	~~$733,243~~
~~$1-5.5mil~~	~~87~~	~~0~~	~~1.8~~	~~12~~	~~$1,574,360~~	~~$1,925,144~~
~~$5.5-20.5mil~~	~~11~~	~~8~~	~~1.7~~	~~6~~	~~$7,716,052~~	~~$8,257,405~~
~~$20.5mil+~~	~~5~~	~~5~~	~~7.8~~	~~25~~	~~$22,967,309~~	~~$23,312,445~~
~~*Total ownership entities*~~	~~*868*~~				-	-

~~**Table 100 - Description of groundfish-dependent entities regulated by the Proposed Action**~~

~~Sales~~	~~Number of entities~~	~~Number of large businesses~~	~~Average number of fishing permits owned per entity~~	~~Maximum fishing permits per entity~~	~~Median gross sales per entity~~	~~Mean gross sales per entity~~	~~Median groundfish sales per entity~~	~~Mean groundfish sales per entity~~
~~<$50K~~	~~10~~	~~0~~	~~1.3~~	~~3~~	~~$10,665~~	~~$18,467~~	~~$3,363~~	~~$5,366~~
~~$50-100K~~	~~5~~	~~0~~	~~1.2~~	~~2~~	~~$80,138~~	~~$77,862~~	~~$20,063~~	~~$25,307~~
~~$100-500K~~	~~57~~	~~0~~	~~1.5~~	~~4~~	~~$193,021~~	~~$232,008~~	~~$104,450~~	~~$134,790~~
~~$500K-1mil~~	~~18~~	~~0~~	~~2.1~~	~~5~~	~~$738,240~~	~~$771,419~~	~~$477,286~~	~~$490,127~~
~~$1-5.5mil~~	~~24~~	~~0~~	~~3.1~~	~~12~~	~~$1,492,711~~	~~$1,928,132~~	~~$1,109,154~~	~~$1,252,107~~
~~$5.5-20.5mil~~	~~0~~	~~0~~	~~0.0~~	~~0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
~~$20.5mil+~~	~~0~~	~~0~~	~~0.0~~	~~0~~	~~$0~~	~~$0~~	~~$0~~	~~$0~~
~~Total ownership entities~~	*~~114~~*				-	-	-	-

~~8.11.2.5 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records~~

~~The proposed rules in FW 52 are not expected to create any additional reporting, record-keeping or other compliance requirements.~~

~~8.11.2.6 Identification of all relevant Federal rules, which may duplicate, overlap or conflict with the proposed rule~~

~~No relevant Federal rules have been identified that would duplicate or overlap with the proposed action.~~

~~8.11.2.7 Significance of economic impacts on small entities~~

~~Substantial number criterion~~

~~In colloquial terms, substantial number refers to "more than a few." The majority of the regulated entities impacted by this action are considered small, but the proposed alternative is expected to have a *positive* impact on a substantial number of small entities.~~

~~Significant economic impacts~~

~~The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability.~~

- ~~Disproportionality refers to whether or not the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities.~~
- ~~Profitability refers to whether or not the regulations significantly reduce profits for a substantial number of small entities.~~

~~While the proposed action is expected to have positive economic impacts, small entities are not expected to be at a significant competitive disadvantage relative to large entities. Impacts on profitability from the proposed action are likely to positively affect both small and large entities in a broadly similar manner.~~

~~8.11.2.8 Description of impacts on small entities~~

~~This Initial Regulatory Flexibility Act (IRFA) analysis is intended to analyze the impacts of the alternatives described in Section 4.0 of FW 52 on small entities. The proposed action alters the criteria for triggering Accountability Measures for windowpane flounder, and may result in either smaller AM areas (i.e., duration or size) in the north and south areas or a decreased likelihood of triggering AMs in either/both areas. These provisions are expected to positively impact profitability of small entities regulated by this action.~~

Economic impacts to groundfish-dependent small entities

The proposed action is expected to result in either a lower probability of triggering an AM or, if an AM is triggered, a smaller gear restricted area (i.e., duration or time). In all cases the proposed action is expected to have positive economic impacts to small groundfish-dependent entities relative to the no action alternative. A more detailed discussion of the expected economic and social impacts can be found in Section 7.4 and Section 7.5 of this document, respectively.

9.0 References

9.1 Glossary

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

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

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

Anadromous species: fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anaerobic sediment: Sediment characterized by the absence of free oxygen.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Annual Catch Entitlement (ACE): Pounds of available catch that can be harvested by a particular sector. Based on the total PSC for the permits that join the sector.

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship

S=1-A.

ASPIC (A Surplus Production Model Incorporating Covariates): A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define B_{MSY} and F_{MSY} reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g., within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g., coral reefs.

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

B_{MSY}: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc.).
2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, $B_{threshold}$ is often defined as either $1/2B_{MSY}$ or $1/4\ B_{MSY}$. $B_{threshold}$ is also known as $B_{minimum}$.

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1^+ biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3^+ biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

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

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

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

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

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

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

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

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

Closed Area Model: A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

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

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

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

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (B_{MSY} or proxy) as a management objective. The biomass threshold ($B_{threshold}$ or B_{min}) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

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

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

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

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterized by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

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

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

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

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

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

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

$F_{0.1}$: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

F_{MAX}: a fishing mortality rate that maximizes yield per recruit. F_{MAX} is less conservative than $F_{0.1}$.

F_{MSY}: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

$F_{threshold}$: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses F_{MSY} or F_{MSY} proxy for $F_{threshold}$. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

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

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

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush- like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

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

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

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

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

Larvae stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Lethrinids: Fish of the genus *Lethrinus*, commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

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

Lutjanids: Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A_{50} is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1^+ mean biomass; mean biomass summed across ages 3 and over is 3^+ mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

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

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

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

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

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

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

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

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

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

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

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

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

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

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

Organic matter: Material of, relating to, or derived from living organisms.

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

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

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding preferably on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Possession-limit-only permit: an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Potential Sector Contribution (PSC): The percentage of the available catch a limited access permit is entitled to after joining a sector. Based on landings history as defined in Amendment 16. The sum of the PSC's in a sector is multiplied by the groundfish sub-ACL to get the ACE for the sector.

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

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

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

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

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

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

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

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

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be "highly" or "moderately" vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

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

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

Stock of concern: a regulated groundfish stock that is overfished, or subject to overfishing.

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats*.

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Surficial sediment: Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

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

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

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

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

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Taxa: The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a "target" (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

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

Trophic guild: Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

Turbidity: Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

Two-bin (displacement) model: a model used to estimate the effects of area closures. This model assumes that effort from the closed areas (first bin) is displaced to the open areas (second bin). The total effort in the system is then applied to the landings-per-unit-effort (LPUE) in open areas to obtain a projected catch. The percent reduction in catch is calculated as a net result.

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

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

Z: instantaneous rate of total mortality. The components of Z are additive (i.e., Z = F+M)

Zooplankton: See *Phytoplankton*. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

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