Framework Adjustment 51
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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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. The most recent multispecies amendment, published as Amendment 16, was submitted for review by the National Marine Fisheries Service in October 2009 and became effective on May 1, 2010. This amendment adopted a broad suite of management measures in order to achieve fishing mortality targets and meet other requirements of the M-S Act. Included in Amendment 16 was a process for setting specification for the fishery and updating measures through framework actions.

Seven framework adjustments have updated the measures in Amendment 16. The first, published as Framework 44, became effective on May 1, 2010 concurrently with Amendment 16. It adopted the required specifications for regulated northeast multispecies stocks for fishing years 2010-2012, as well as stocks managed by the U.S./Canada Resource Sharing Agreement. It was also used to incorporate the best available information in adjusting effort control measures adopted in Amendment 16. Framework 45 became effective on May 1, 2011. It built upon revisions made to the sector program in Amendment 16 and Framework 44, set specifications required under the U.S./Canada Resource Sharing Agreement, and incorporated an updated stock assessment for pollock. Framework 46 was implemented in September 14, 2011 and modified the provisions that restrict mid-water trawl catches of haddock. Framework Adjustment 47 was implemented May 1, 2012 and set specifications for some groundfish stocks for FY 2012-2014, modified AMs for the groundfish fishery and the administration of the scallop fishery AMs, revised common pool management measures. Framework Adjustment 48 (FW 48) was partial implemented on May 1, 2014; some measures in FW 48 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 Adjustment 50 was also implemented on September 30, 2013 which set specifications for many groundfish stocks and modified the rebuilding program for SNE/MA winter flounder. Framework Adjustment 49 is a joint Northeast Multispecies/Atlantic Sea Scallop action that modifies the dates for scallop vessel access to the year-round groundfish closed areas; this action was implemented on May 20, 2013.

Amendment 16 made major changes to the FMP. For several groundfish stocks, the mortality targets adopted by Amendment 16, and the resulting specifications in Framework 44, represented substantial reductions from existing levels. For other stocks, the mortality targets were at or higher than existing levels and mortality could remain the same or even increase. Because most fishing trips in this fishery catch a wide range of species, it is impossible to design effort control measures that will change mortality in a completely selective manner for individual species. The management measures adopted by Amendment 16 to reduce mortality where necessary were also expected to reduce fishing mortality unnecessarily on other, healthy stocks. As a result of these lower fishing mortality rates, yield from healthy stocks could be sacrificed and the management plan may not provide optimum yield - the amount of fish that will provide the greatest overall benefit to the nation. Amendment 16 created opportunities to target these healthy stocks. The FMP allows vessels with groundfish permits to either fish under the days-at-sea (DAS) effort control system or to join sectors, which are small groups of self-selected fishermen that receive an allocation of annual catch entitlement (ACE) based upon the catch history of each member. The Amendment also adopted a system of Annual Catch Limits (ACLs) and Accountability Measure (AMs) that are designed to ensure catches remain below desired targets.

This framework (Framework Adjustment 51, FW51) is primarily intended to meet regulatory requirements by modifying the rebuilding programs and setting specifications for some of the groundfish stocks. This framework action would continue to improve management of the fishery. It incorporates the results of new stock assessments into the setting of specifications, including the catch limits for the U.S./Canada Resource Sharing Understanding and the distribution of ACLs to various components of the fishery. FW51 also would establish additional management measures related to U.S./Canada shared stocks and yellowtail flounder in the groundfish and scallop fisheries.

The *need* for this action is to set specifications for FY 2014 – 2016 that are consistent with the best available science, to modify the rebuilding programs for Gulf of Maine cod and American plaice, and to modify management measures in order to ensure that overfishing does not occur consistent with the status of stocks, and the requirements of MSA of 2006. There are several *purposes*: to adopt specifications, to adopt the U.S./Canada Total Allowable Catches (TACs), to modify the formal rebuilding program for Gulf of Maine cod and American plaice, establish an administrative measure to outline the steps to review the revised Gulf of Maine cod rebuilding plan, to establish an administrative measure to outline the steps to review the revised American plaice rebuilding plan, to establish an accountability measure for the Georges Bank yellowtail flounder sub-ACL in small-mesh fisheries, to provide a mechanism to transfer quota between US and Canada shared stocks, to establish a mechanism to transfer Eastern Georges Bank haddock quota to Western Georges Bank haddock quota, to revise the discard strata for Georges Bank yellowtail flounder, and to address the possession of GB and SNEMA yellowtail flounder in the limited access scallop fishery.

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 proposed management action.

If the Preferred Alternatives identified in this document are adopted, this action would implement a range of measures designed to achieve mortality targets and net benefits from the fishery. Details of the measures summarized below can be found in Section 4.0.

The Preferred Alternatives include:

- *Formal Rebuilding Programs and Annual Catch Limits:*
    - *Revised rebuilding strategy for Gulf of Maine cod*. The preferred alternative would rebuild the stock in 10 years, with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75% F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16. The net effect of this rebuilding strategy is to accelerate the rebuilding timeline and increase the likelihood of success. In addition, it would establish a rebuilding plan review analysis for use during the new rebuilding period for Gulf of Maine cod, as an administrative measure.
    - *Revised rebuilding strategy for American plaice*. The preferred alternative would rebuild the stock in 10 years, with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75% F_{MSY}; $F_{rebuild}$ is not allowed to

be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16. The net effect of this rebuilding strategy is to accelerate the rebuilding timeline and increase the likelihood of success. In addition, it would establish a rebuilding plan review analysis for use during the new rebuilding period for American plaice, as an administrative measure.

- *Revised Annual Catch Limit Specifications*. The preferred alternative would adopt new Overfishing Limits (OFLs), Acceptable Biological Catches (ABCs), and Annual Catch Limits (ACLs) for Georges Bank yellowtail flounder and white hake, and in addition Eastern Georges Bank cod and Eastern Georges Bank haddock total allowable catches (TACs) would be as specified. This alternative would also distribute the ABCs to the various components of the fishery. The OFLs, ABCs, and ACLs included in this preferred alternative for all of the other groundfish stocks would be the same as those specified in FW50.

- *Commercial and Recreational Fishery Measures.* These measures, based on the Preferred Alternatives, would affect commercial fishing.
  - *Small-mesh Fishery Accountability Measures for Georges Bank Yellowtail Flounder*. The preferred alternative would establish a gear-based accountability measure (AM) that would be implemented if the small-mesh fishery sub-ACL of Georges Bank yellowtail flounder is exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of Georges Bank yellowtail flounder. This would be a reactive AM.

  - *Management Measures for US/CA TACs*. The preferred alternative would allow the Regional Administrator to adjust the US/CA quotas during the FY, i.e. after allocations were made. Additional quota would be allocated consistent with the current ABC distribution, which would include both groundfish and non-groundfish vessels (i.e., scallops and small-mesh fisheries). The RA would not have the authority to change the allocations to the sub-ACLs during the FY. The RA's authority would be time limited and only exist for trades made by or before the end of the 2014 fishing year. In addition, a sector, or state-operated permit bank, would be able to convert its Eastern GB haddock ACE to Western GB haddock ACE at any time during the fishing year, and up to 2 weeks into the following fishing year (unless otherwise instructed by NMFS) to cover any overage during the previous fishing year. These preferred alternatives are intended to increase flexibility and create additional fishing opportunities.

  - *Georges Bank Yellowtail Flounder Management Measures.* The preferred alternative would modify the stratification used for estimating discards of GB yellowtail flounder for in-season quota monitoring of sector catches. It would not change the stratification used in assessments, nor would it change the stratification used to monitor common pool fishing trips. GB yellowtail flounder discards on groundfish trips would be calculated for two different areas: statistical area 522 and all other GB yellowtail flounder statistical areas (525, 561, and 562).

  - *Prohibition on the Possession of Yellowtail Flounder by the Limited Access Scallop Fishery*. The preferred alternative would prohibit possession of yellowtail flounder stocks

(GB and SNE/MA) for the limited access scallop fishery vessels. Yellowtail flounder could not be landed or sold by the limited access scallop fishery. This would not change existing regulations for the General Category/IFQ vessels that are already prohibited from possessing yellowtail flounder.

Summary of Environmental Consequences

The environmental impacts of all of the alternatives under consideration are described in Section 1.0. 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 should the Proposed Action be based on the Preferred Alternatives 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 FY 2013 as appropriate.

Biological Impacts
The extension of the GOM cod and American plaice rebuilding plans will result in increased fishing mortality and slower stock rebuilding than would be the case under the No Action alternative. The revised specifications for white hake and GB yellowtail flounder will increase the probability that mortality targets will be achieved, and stock rebuilding will continue, consistent with the adopted rebuilding plans, when compared to the No Action alternatives. Coupled with these changes are management measures to reduce catches of GB yellowtail flounder by small-mesh fisheries should their AM be triggered and prohibition on the landing of yellowtail flounder by LA scallop vessel.

Essential Fish Habitat (EFH) Impacts
The preferred alternatives are expected to result in a slight increase in habitat impacts when compared to the No Action alternative. This is due to two factors: the modification in the GOM cod and American plaice rebuilding strategies and the specifications that would be higher under the preferred alternative than under No Action. The small-mesh fishery AM for GB yellowtail flounder could reduce fishing effort if triggered and reduce impacts to habitat.

Impacts on Endangered and Other Protected Species
When compared to recent fishing activity, the specifications that result from the preferred alternatives are likely to lead to negligible reduced impacts on endangered and protected species. Impacts of the preferred alternative for specifications may be higher than under the No Action alternative, however, because these stocks that would not have any specifications under the No Action alternative, which could reduce fishing effort. The revised GOM cod and American plaice rebuilding strategies may result in a small increase in groundfish fishing activity in the stock area but this small increase is not expected to impact protected species. The small-mesh fishery AM for GB yellowtail flounder could reduce fishing effort if triggered and reduce impacts to endangered and protected species.

Economic Impacts
The preferred alternative will likely result in an increase in groundfish fishing vessel revenues when compared to No Action. This is not informative, however, since the No Action alternative would not adopt specifications for several stocks and so most groundfish fishing activity would be curtailed. The preferred alternative would be expected to result in gross groundfish revenues for FY2014 predicted to be just over $55 million and all gross revenues on groundfish trips are predicted to be just under $71 million. This represents approximately a 26% reduction in all gross revenues on groundfish trips relative to

FY2012 and a 4% reduction relative to those predicted in FY2013. The economic impacts will not be uniformly distributed. The preferred alternatives for the management measures would lead to some positive economic benefits.

Social Impacts
In general, the preferred alternatives are likely to result in positive social benefits when compared to the No Action alternative and when compared to previous fishing years. The revised GOM cod and American plaice rebuilding strategies and preferred alternatives for the management measures would lead to some positive social benefits.

Alternatives to the Proposed Action

If the Proposed Action is based on the Preferred Alternatives there are a number of alternatives that would not be adopted. In all cases these alternatives are the No Action alternatives. These alternatives are briefly described below.

- *Formal Rebuilding Programs and Annual Catch Limits:*
    - *Rebuilding Strategy for Gulf of Maine cod*. The No Action alternative would maintain fishing mortality (set at 75% FMSY) as implemented in FW 50 for FY 2014. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015. The No Action alternative would not address this Magnuson-Stevens Act requirement to revise the rebuilding program because the stock was not making adequate rebuilding progress. In addition, the No Action alternative would maintain the current biennial review process.
    - *Rebuilding Strategy for American plaice*. The No Action alternative would maintain fishing mortality (set at 75% FMSY) as implemented in FW 50 for FY 2014. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015. The No Action alternative would not address this Magnuson-Stevens Act requirement to revise the rebuilding program because the stock was not making adequate rebuilding progress. In addition, the No Action alternative would maintain the current biennial review process.
    - *Annual Catch Limit Specifications*. The No Action alternative would not adopt new specifications for Georges Bank yellowtail flounder and white hake. 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, FY 2014 quotas would not be specified for the transboundary Georges Bank stocks (Georges Bank yellowtail flounder, Eastern Georges Bank cod, and Eastern Georges Bank haddock), which are managed through the US/CA Resource Sharing Understanding.

- *Commercial and Recreational Fishery Measures:*
    - *Small-mesh Fishery Accountability Measures for Georges Bank Yellowtail Flounder*. The No Action alternative would not establish additional accountability measures (AMs) for the small-mesh fishery for Georges Bank (GB) yellowtail flounder under the Multispecies FMP. This alternative would not address the requirement to adopt sufficient AMs that would help prevent the small-mesh fishery from exceeding its allocation of GB yellowtail flounder, or that would mitigate an overage should one occur.

- *Management Measures for US/CA TACs*. The No Action alternative would not establish any changes to the management of US/CA TACs

- *Georges Bank Yellowtail Flounder Management Measures.* The No Action alternative would not make changes to the management measures for GB yellowtail flounder for estimating discards.

- *Possession of Yellowtail Flounder by the Limited Access Scallop Fishery.* The No Action alternative would maintain in the limited access scallop fishery that there be no trip limit for yellowtail flounder stocks (GB and SNE/MA) and limited access scallop vessels would continue to be required to land all legal-sized yellowtail flounder that is caught, as established in FW44 to the Groundfish FMP. Note that the retention does not apply to General Category/IFQ vessels.

Impacts of Alternatives to the Proposed Action

In many cases, the No Action alternatives would not have met current requirements of the M-S Act. Only the most significant impacts are highlighted below.

Biological Impacts
Because the No Action alternatives would not adopt specifications for several stocks, and would not adjust the GOM cod and American plaice strategies, it would lead to a drastic reduction in groundfish fishing activity. This option would be expected to result in reduced fishing mortality rates and faster stock rebuilding than the preferred alternatives.

Essential Fish Habitat
Because the No Action alternatives would not adopt specifications for several stocks, and would not adjust the GOM cod and American plaice strategies, it would lead to a drastic reduction in groundfish fishing activity. This option would be expected to result in reduced habitat impacts when compared to the preferred alternatives.

Impacts on Endangered and Other Protected Species
Because the No Action alternatives would not adopt specifications for several stocks, and would not adjust the GOM cod and American plaice strategies, it would lead to a drastic reduction in groundfish fishing activity. This option would be expected to result in reduced fishing impacts on endangered and other protected species.

Economic Impacts
Because the No Action alternatives would not adopt specifications for several stocks, and would not adjust the GOM cod and American plaice strategies or adopt additional management measures. As a result, fishing vessel revenues on groundfish fishing trips would decline dramatically when compared to the preferred alternative or recent fishing years.

Social Impacts
Because the No Action alternatives would not adopt specifications for several stocks, and would not adjust the GOM cod and American plaice strategies or adopt additional management measures, it would lead to a drastic reduction in groundfish fishing activity and reduced groundfish fishing revenues. Overall, this would likely lead to dramatic changes in the size and demographics of the groundfish fishery, dissatisfaction with the fishing industry and management, and a negative impact on fishermen’s attitudes and beliefs.

2.0 Contents

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2.5 List of Acronyms

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

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
NERO	Northeast Regional Office
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	Weighout
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.

Seven framework adjustments have updated the measures in Amendment 16. The first, published as Framework 44, became effective on May 1, 2010 concurrently with Amendment 16. It adopted the required specifications for regulated northeast multispecies stocks for fishing years 2010-2012, as well as stocks managed by the U.S./Canada Resource Sharing Agreement. It was also used to incorporate the best available information in adjusting effort control measures adopted in Amendment 16. Framework 45 became effective on May 1, 2011. It built upon revisions made to the sector program in Amendment 16 and Framework 44, set specifications required under the U.S./Canada Resource Sharing Agreement, and incorporated an updated stock assessment for pollock. Framework 46 was implemented in September 14, 2011 and modified the provisions that restrict mid-water trawl catches of haddock. Framework Adjustment 47 was implemented May 1, 2012 and set specifications for some groundfish stocks for FY 2012-2014, modified AMs for the groundfish fishery and the administration of the scallop fishery AMs, revised common pool management measures. Framework Adjustment 48 (FW 48) was partially implemented on September 30, 2013; some measures in FW 48 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 Adjustment 50 was also implemented on September 30, 2013 which set specifications for many groundfish stocks and modified the rebuilding program for SNE/MA winter flounder. Framework Adjustment 49 is a joint Northeast Multispecies/Atlantic Sea Scallop action that modifies the dates for scallop vessel access to the year-round groundfish closed areas; this action was implemented on May 20, 2013.

This framework (Framework Adjustment 51, FW51) is primarily intended to meet regulatory requirements by modifying the rebuilding programs and setting specifications for some of the groundfish stocks. FW51 also would establish additional management measures related to U.S./Canada shared stocks and yellowtail flounder in the groundfish and scallop fisheries.

3.2 Purpose and Need for the Action

Under the Northeast Multispecies FMP the National Marine Fisheries Service (NMFS) Regional Administrator, in consultation with the Council, is required to determine the specifications for the groundfish fishery. The best available science is reviewed to determine the status of the resource and fishery. These data, in conjunction with the ABC control rules adopted in Amendment 16, are used to set appropriate specifications for the stocks. Previous actions have established evaluation protocols and rebuilding plans for stocks; these are revised with the updated science. Periodic frameworks are used to adjust strategies in response to the evaluations that adjust rebuilding plans and overfishing.

This framework adds to elements of Amendment 16 to prevent overfishing. Similar modifications to Amendment 16 have been made in recent frameworks. This framework (Framework Adjustment 51, FW51) is primarily intended to meet regulatory requirements by modifying the rebuilding programs for Gulf of Maine cod and American plaice and setting specifications for white hake and stocks managed by the U.S./Canada Resource Sharing agreement (Eastern Georges Bank cod, Eastern Georges Bank haddock, and Georges Bank yellowtail flounder). FW51 also would establish an accountability measure for the Georges Bank yellowtail flounder sub-ACL in small-mesh fisheries, a mechanism to transfer quota between US and Canada shared stocks, a mechanism to transfer Eastern Georges Bank haddock quota to Western Georges Bank haddock quota, a revised discard strata for Georges Bank yellowtail flounder, and possession of yellowtail flounder in the scallop fisheries.

These specifications and adjustments to Amendment 16, listed in the following table, 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, the following table summarizes the need for the action and corresponding purposes.

Need for Framework 51	***Corresponding Purpose for Framework 51***
Ensure that Gulf of Maine cod and American plaice are managed consistent with the status of stocks, the National Standard guidelines, and the requirements of the MSA	• Modification of the formal rebuilding program for Gulf of Maine cod • Modification of the formal rebuilding program for American plaice • Administrative measure to outline the steps to review the revised Gulf of Maine cod rebuilding plan • Administrative measure to outline the steps to review the revised American plaice rebuilding plan
Ensure that levels of catch for Fishing Years 2014-2016 are consistent with best available science, the ABC control rules adopted in Amendment 16 to the Northeast Multispecies FMP, the International Fisheries Agreement Clarification Act, and the most recent relevant law	• Measures to adopt ACLs, including relevant sub-ACLs and incidental catch TACs • Measures to adopt TACs for U.S./Canada area
Ensure that overfishing does not occur consistent with the status of stocks, and the requirements of MSA of 2006	• Measures to establish an accountability measure for the Georges Bank yellowtail flounder sub-ACL in small-mesh fisheries • Measure to provide a mechanism to transfer quota between US and Canada shared stocks, • Measures to establish a mechanism to transfer Eastern Georges Bank haddock quota to Western Georges Bank haddock quota, • Measures to revise the discard strata for Georges Bank yellowtail flounder • Measure to address the possession of GB and SNEMA yellowtail flounder in the limited access scallop fishery.

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 rejected 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 1994 can be found in Amendment 5 (NEFMC 1993).

Amendment 5 was a major revision to the FMP. Adopted in 1994, it implemented reductions in time fished (days-at-sea, or DAS) for some fleet sectors and adopted year-round closures to control mortality. Amendment 7 (NEFMC 1996), adopted in 1996, expanded the DAS program and accelerated the reduction in DAS first adopted in Amendment 5. 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.

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 FY2012. This approach informs the analysis and provides a baseline for the public to better understand the operation of the r fishery. Some differences in totals between this analysis and prior analyses exist. These are due to updates to the source data and a minor modification to the sector membership algorithm. Sector membership is now based on MRI rather than vessel permit number. The MRIs within a sector do not change during a fishing year, whereas a vessel permit may move into or out of a sector (although this is rare). Hence, MRI is a more reliable means of tracking sector membership.

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. This definition differs from other methods of defining a groundfish trip that use a sector VMS declaration regardless of whether groundfish was landed and applied to a sector ACE. 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. It is important to note that there are different sources of fishery data (i.e., observer, self-reported, dealer, etc.), and the data used in this EA may be different than data published from other sources, such as reports from the NEFSC.

The EA analysis uses complete data sources. As such, trips with undefined gear, missing land dates, missing sector membership, and trips that did not submit a VTR were excluded. Such records may be included in other groundfish trip analysis and reports, but detailed trip data is required for the purpose of this EA. Total trip counts and catch counts in the EA may differ when comparing to the sector data available to the public on the NMFS website. Reasons for this difference include the following:

- The EA analyses use VTR and observer data (rationale explained above). The data on the sector website is from VMS, VTR, and dealer data. Therefore, a trip that was reported by a dealer, but which has no corresponding VTR, is displayed on the website, but not in the EA. Likewise, a trip that is reported only on the VMS declaration will be counted on the website, but is not included in the EA. This is the major source of trip count differences.
- The EA uses data from four years. The primary purpose of quota monitoring is to determine the ACE as accurately as possible. Because of this difference in purpose, NMFS matches trips between multiple data sources to account for misreporting. The EA has two data sources, but uses them in separate analyses, thus it does not need to perform trip matching. Trip matching can have small effects on trip counts.
- Catch weights will differ between the EA and other publically available sector data, because the EA uses landed weight, as estimated by fishermen and reported on the VTR, whereas NMFS reports dealer live weight on their website.

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4.0 Alternatives Under Consideration

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

4.1.1 Gulf of Maine Cod Rebuilding Strategy

4.1.1.1 Option 1: No Action

The current rebuilding strategy for Gulf of Maine (GOM) cod, adopted in Amendment 13, uses a fishing mortality target that is calculated to rebuild the stock by 2014 with a 50 percent (median) probability of success. The stock is unlikely to rebuild by that date in the absence of all fishing mortality and in 2012, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the Magnuson-Stevens Act requires that a revised rebuilding program be implemented within 2 years for GOM cod. This No Action alternative would not address this Magnuson-Stevens Act requirement. If this option is adopted fishing mortality (set at 75% F_{MSY}) as implemented in FW 50 would be maintained in 2014. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015.

4.1.1.2 Option 2: Revised Rebuilding Strategy for Gulf of Maine Cod (*Preferred Alternative*)

Two options are being considered for a revised rebuilding strategy for GOM cod. Both rebuilding options assume no changes to the FY 2014-2015 ABC (1,550 mt) that was previously recommended by the SSC, and adopted by FW 50.

<u>Sub-Option A</u>: This strategy would rebuild the stock in 8 years, with a 50 percent (median) probability of success by 2022. This strategy is developed to be more conservative compared to sub-Option B. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16.

<u>Sub-Option B (*Preferred Alternative*)</u>: This strategy would rebuild the stock in 10 years, with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16.

Rationale: Long-term projections have often proven to be unreliable and tend to be optimistic. There is also considerable uncertainty surrounding $F_{rebuild}$ estimates (and other reference points such as 75%F_{MSY}) due to the estimate's dependence on future recruitment, which is difficult to predict. As a result, basing an ABC on $F_{rebuild}$ is not desirable since it can quickly lead to dramatic reductions in the ABCs. As $F_{rebuild}$ approaches zero, it is less likely to be used for ABC determinations. To avoid the uncertainties associated with $F_{rebuild}$-based ABCs, the rebuilding strategies were designed so that $F_{rebuild}$ is greater than 75% F_{MSY}. $F_{rebuild}$ is defined as the constant harvest rate that will allow the stock to have a 50% chance of rebuilding within the specified time frame. During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16, which requires fishing at $F_{rebuild}$ or 75% F_{MSY}, whichever is lower. GOM cod requires at least eight years for $F_{rebuild}$ to remain above 75%F_{msy}. $F_{rebuild}$ was estimated to be below F_{MSY} with the maximum 10 year rebuilding plan. This program is designed to use 75%F_{MSY} initially. However, if progress is not made, it is possible that $F_{rebuild}$ would become lower than 75% F_{MSY}, and catches would be set based on $F_{rebuild}$. There is little difference in the rebuilding time needed under the accepted base case or M-ramp model (M=0.2 in projections) for GOM cod; no reference points are available for the M-ramp model. However the catches estimated in the out years and the SSB_{MSY} are different between the models. The M-ramp projection assumes a change in M back to 0.2. The SARC 55 Panel concluded that if M is currently 0.4 then it seemed more reasonable to assume that in the short-term M would remain at 0.4 rather than reduce to 0.2. However, a change back to 0.2 is required to rebuild the stock. It is not known when M will change back to 0.2 in the future for the M-ramp formulation so interpretation and development of rebuilding plans using the M-ramp model is more difficult. For informational purposes if F=0, it would take 6 years to rebuild Gulf of Maine cod.

4.1.1.3 Option 3: Rebuilding Plan Review Analysis for Gulf of Maine Cod (*Preferred Alternative*)

If this option is selected, it must be selected in conjunction with an above option under 4.1.1.2 Option 2.

Sub-Option A: No Action: Under the current biennial review process, the PDT would use the most recent scientific information available to develop ABC recommendations based on the ABC control rule, the fishing mortality rate necessary to rebuild the stock, guidance from the SSC, and any other available information. In addition to developing ACLs for the upcoming fishing years, the PDT would also recommend other management options necessary to achieve the goals and objectives of the FMP.

Sub-Option B (*Preferred Alternative*): If this option is adopted, it would establish a rebuilding plan review analysis for use during the new rebuilding period for Gulf of Maine cod. This option is an administrative measure. The review analysis would occur only if all three of the following conditions are met: 1) the total ACL for the Gulf of Maine cod stock has not been exceeded during the new rebuilding plan, 2) new information indicates the Gulf of Maine cod stock is below its rebuilding trajectory, and subsequently 3) $F_{rebuild}$ falls below 75% F_{MSY}.

Under these conditions, the Council would task its appropriate body (e.g., Groundfish PDT, SSC) with providing new catch advice options for Gulf of Maine cod to aid decision-making, in priority order, that:

1) Consider extending the rebuilding program to the maximum 10 years if a shorter time frame was initially adopted;
2) Review biomass reference points; and
3) Provide F-rebuild ACLs under 1 and 2 (directly above), in addition to those based on the rebuilding plan adopted in FW51. However since biomass reference points would be reviewed but not necessarily changed, F-rebuild ACLs under 2 (directly above) may also remain unchanged.

Rationale: This measure outlines the administrative steps that would be taken to review the GOM cod rebuilding plan, should the specified conditions be met, in order to investigate why rebuilding has not occurred as expected. These types of analyses would likely already be completed under the current biennial review process, and not necessarily only when the above conditions are met. However, the administrative steps are not explicitly identified in the current biennial review process. The basis for such a review would be an assessment benchmark or update.

4.1.2 American Plaice Rebuilding Strategy

4.1.2.1 Option 1: No Action

The current rebuilding strategy for American plaice, adopted in Amendment 13, uses a fishing mortality target that is calculated to rebuild the stock by 2014 with a 50 percent probability of success. The stock is unlikely to rebuild by that date in the absence of all fishing mortality, and in 2012, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the Magnuson-Stevens Act requires that a revised rebuilding program be implemented within 2 years for American plaice. This No Action alternative would not address this Magnuson-Stevens Act requirement. If this option is adopted fishing mortality (set at 75% F_{MSY}) as implemented in FW 50 would be maintained in 2014. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015.

4.1.2.2 Option 2: Revised Rebuilding Strategy for American Plaice (*Preferred Alternative*)

Three options are being considered for a revised rebuilding strategy for American plaice. All three rebuilding options assume no changes to the FY 2014-2015 ABCs that were previously recommended by the SSC, and adopted by FW 50.

<u>Sub-Option A</u>: The rebuilding strategy would be to rebuild the stock in 7 years with a 50 percent (median) probability of success by 2021. This strategy is the most conservative compared to sub-Options B and C. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16.

<u>Sub-Option B</u>: The rebuilding strategy would be to rebuild the stock in 8 years with a 50 percent (median) probability of success by 2022. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16.

<u>Sub-Option C (*Preferred Alternative*)</u>: The rebuilding strategy would be to rebuild the stock in 10 years with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}). During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16.

Rationale: Long-term projections have often proven to be unreliable and tend to be optimistic. There is also considerable uncertainty surrounding $F_{rebuild}$ estimates (and other reference points such as 75%F_{MSY}) due to the estimate's dependence on future recruitment, which is difficult to predict. As a result, basing an ABC on $F_{rebuild}$ is not desirable since it can quickly lead to dramatic reductions in the ABCs. As $F_{rebuild}$ approaches zero, it is less likely to be used for ABC determinations. To avoid the uncertainties associated with $F_{rebuild}$-based ABCs, the rebuilding strategies were designed so that $F_{rebuild}$ is greater than 75% F_{MSY}. $F_{rebuild}$ is defined as the constant harvest rate that will allow the stock to have a 50% chance of rebuilding within the specified time frame. During the rebuilding time period, catch advice would continue to be set consistent with the ABC Control Rule adopted in A16, which requires fishing at $F_{rebuild}$ or 75% F_{MSY} whichever is lower. American plaice requires at least seven years for $F_{rebuild}$ to remain above 75%F_{msy}. $F_{rebuild}$ was estimated to be below F_{MSY} with the maximum 10 year rebuilding plan. This program is designed to use 75%F_{MSY} initially. However, if progress is not made, it is possible that $F_{rebuild}$ would become lower than 75% F_{MSY}, and catches would be set based on $F_{rebuild}$. For informational purposes if F=0, it would take 4 years to rebuild American plaice.

4.1.2.3 Option 3: Rebuilding Plan Review Analysis for American Plaice (*Preferred Alternative*)

If this option is selected it must be selected in conjunction with an above option under 4.1.2.2 Option 2.

Sub-Option A: No Action: Under the current biennial review process, the PDT would use the most recent scientific information available to develop ABC recommendations based on the ABC control rule, the fishing mortality rate necessary to rebuild the stock, guidance from the SSC, and any other available information. In addition to developing ACLs for the upcoming fishing years, the PDT would also recommend other management options necessary to achieve the goals and objectives of the FMP.

Sub-Option B (*Preferred Alternative*): If this option is adopted, it would establish a rebuilding plan review analysis for use during the new rebuilding period for American plaice. This option is an administrative measure. The review analysis would occur only if three conditions were met: 1) the total ACL for the American plaice stock has not been exceeded during the new rebuilding plan, 2) new information indicates the American plaice stock is below its rebuilding trajectory, and subsequently 3) $F_{rebuild}$ falls below 75% F_{MSY}.

Under these conditions , the Council would task its appropriate body (e.g., Groundfish PDT, SSC) with providing new catch advice options for American plaice to aid decision-making, in priority order, that:

1) Consider extending the rebuilding program to the maximum 10 years if a shorter time frame was initially adopted;
2) Review biomass reference points; and
3) Provide F-rebuild ACLs under 1 and 2 (directly above), in addition to those based on the rebuilding plan adopted in FW51. However since biomass reference points would be reviewed but not necessarily changed, F-rebuild ACLs under 2 (directly above) may also remain unchanged.

Rationale: This measure outlines the administrative steps that would be taken to review the American plaice rebuilding plan, should the specified conditions be met, in order to investigate why rebuilding has not occurred as expected. These types of analyses would likely already be completed under the current biennial review process, and not necessarily only when the above conditions are met. However, the administrative steps are not explicitly identified in the current biennial review process. The basis for such a review would be an assessment benchmark or update.

4.1.3 Annual Catch Limits

4.1.3.1 Option 1: No Action

If the No Action is selected, the specifications for FY 2014-FY 2015 would remain as adopted by FW 50. For white hake, there would not be any specifications for these years. The FY 2014 - FY 2015 ABCs would be as specified in Table 1.

If this option is selected, there would be no FY 2014 quotas specified for the transboundary Georges Bank stocks, 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 under this action, it would not address M-S Act requirements to achieve OY and consider the needs of fishing communities.

Table 1 – No Action/Option 1 Northeast Multispecies OFLs, ABCs, ACLs, and other ACL sub-components for FY 2012 (metric tons, live weight). Values are rounded to the nearest metric ton.

(1) Grayed out values may be adjusted as a result of future recommendations of the TMGC. Values shown for GB haddock and cod are preliminary estimates subject to change.

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components (4)	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	2014	3,570	1,960	20	78	0	1,769		0	1,738	31	0	1,867
	2015	4,191	2,506	25	100	0	2,262		0	2,223	39	0	2,387
	2016												
GOM Cod	2014	1,917	1,550	103	51	0		830	486	812	18	0	1,470
	2015	2,639	1,550	103	51	0		830	486	812	18	0	1,470
	2016												
GB Haddock	2014	46,268	19,229	192	769	0	17,171		0	17,116	56	179	18,312
	2015	56,293	43,606	436	1,744	0	38,940		0	38,814	126	406	41,526
	2016												
GOM Haddock	2014	440	341	5	7	0		220	87	218	2	3	323
	2015	561	435	6	9	0		280	111	278	2	4	412
	2016												
GB Yellowtail Flounder	2014												
	2015												
	2016												

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	2014	1,042	700	7	28	66	564		0	469	95	0	665
	2015	1,056	700	7	28	64	566		0	471	95	0	665
	2016												
CC/GOM Yellowtail Flounder	2014	936	548	33	11	0	479		0	466	13	0	523
	2015	1,194	548	33	11	0	479		0	466	13	0	523
	2016												
American Plaice	2014	1,981	1,515	30	30	0	1,382		0	1,382	24	0	1,442
	2015	2,021	1,544	31	31	0	1,408		0	1,408	25	0	1,470
	2016												
Witch Flounder	2014	1,512	783	23	117	0	610		0	599	11	0	751
	2015	1,846	783	23	117	0	610		0	599	11	0	751
	2016												
GB Winter Flounder	2014	4,626	3,598	0	108	0	3,385		0	3,364	21	0	3,493
	2015												
	2016												
GOM Winter Flounder	2014	1,458	1,078	272	54	0	714.7		0	688.3	26.4	0	1,040
	2015												
	2016												
SNE/MA Winter Flounder	2014	3,372	1,676	235	168	0	1,210		0	1,074	136	0	1,612
	2015	4,439	1,676	235	168	0	1,210		0	1,074	136	0	1,612
	2016												
Redfish	2014	16,130	11,465	115	229	0	10,565		0	10,523	42	0	10,909
	2015	16,845	11,974	120	239	0	11,034		0	10,990	44	0	11,393
	2016												

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	2014												
	2015												
	2016												
Pollock	2014	20,554	16,000	960	1,120	0	13,224		0	13,131	93	0	15,304
	2015												
	2016												
N. Window-pane Flounder	2014	202	151	2	44	0	98		0	0	98	0	144
	2015	202	151	2	44	0	98		0	0	98	0	144
	2016												
S. Window-pane Flounder	2014	730	548	55	186	183	102		0	0	102	0	527
	2015	730	548	55	186	183	102		0	0	102	0	527
	2016												
Ocean Pout	2014	313	235	2	21	0	197		0	0	197	0	220
	2015	313	235	2	21	0	197		0	0	197	0	220
	2016												
Atlantic Halibut	2014	180	109	44	5	0	57		0	0	57	0	106
	2015	198	119	48	6	0	62		0	0	62	0	116
	2016												
Atlantic Wolffish	2014	94	70	1	3	0	62		0	0	62	0	65
	2015	94	70	1	3	0	62		0	0	62	0	65
	2016												

4.1.3.2 Option 2: Revised Annual Catch Limit Specifications (*Preferred Alternative*)

If Option 2 is selected, the annual specifications for FY2014 through FY2015, and FY 2014 through FY 2016 for white hake would be as specified in Table 4. For all stocks, except white hake and the transboundary Georges Bank stocks, the specifications included in Table 4 are the values previously adopted in FW 50 and would be the same as those included in the No Action Alternative. Table 5 provides the preliminary common pool incidental catch TACs for Special Management Programs, based on the ACLs provided in Table 4, and Table 6 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 2014 as indicated in Table 2 below. If NMFS determines that FY 2013 catch of GB cod, haddock, or yellowtail flounder from the U.S./Canada Management Area exceeded the respective 2013 TAC, the U.S./Canada Resource Sharing Understanding and the regulations require that the 2014 TAC is 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 2013. 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 2 – Proposed FY 2014 U.S./Canada TACs (mt) and Country Shares

TAC	Eastern GB Cod	Eastern GB Haddock	GB Yellowtail Flounder
Total Shared TAC	700 mt	27,000 mt	400 mt (Total ABC)
U.S. TAC	154 mt	10,530 mt	328 mt (US ABC)
Canada TAC	546 mt	16,470 mt	72 mt

A comparison of the proposed FY 2014 U.S. TACs and the FY 2013 U.S. TACs is shown in Table 3. Changes to the U.S. TACs reflect changes to the percentage shares, stock status, and the Transboundary Management Guidance Committee (TMGC) recommendations.

Table 3 – Comparison of the Proposed FY 2014 U.S. TACs and the FY 2013 U.S. TACs (mt)

Stock	U.S. TAC		Percent Change
	FY 2014	FY 2013	
Eastern GB cod	154 mt	96 mt	+ 60%
Eastern GB haddock	10,530 mt	3,952 mt	+166%
GB yellowtail flounder	328 mt	215 mt	+53%

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 these catches represent the best scientific information, as determined by the Council's Science 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 4 – Option 2 Northeast Multispecies OFLs, ABCs, ACLs and other ACL sub-components for FY 2014 – FY 2015 (metric tons, live weight). Values are rounded to the nearest metric ton. Sector shares based on 2013 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 (4)	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	2014	3,570	1,960	20	78	0	1,769		0	1,738	31	0	1,867
	2015	4,191	2,506	25	100	0	2,262		0	2,223	39	0	2,387
	2016												
GOM Cod	2014	1,917	1,550	103	51	0		830	486	812	18	0	1,470
	2015	2,639	1,550	103	51	0		830	486	812	18	0	1,470
	2016												
GB Haddock	2014	46,268	19,229	192	769	0	17,171		0	17,116	56	179	18,312
	2015	56,293	43,606	436	1,744	0	38,940		0	38,814	126	406	41,526
	2016												
GOM Haddock	2014	440	341	5	7	0		220	87	218	2	3	323
	2015	561	435	6	9	0		280	111	278	2	4	412
	2016												
GB Yellowtail Flounder	2014	unknown	328		6.6	50.9	254.5		0	251.5	3.1	6.1	318.1
	2015												
	2016												

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	2014	1,042	700	7	28	66	564		0	469	95	0	665
	2015	1,056	700	7	28	64	566		0	471	95	0	665
	2016												
CC/GOM Yellowtail Flounder	2014	936	548	33	11	0	479		0	466	13	0	523
	2015	1,194	548	33	11	0	479		0	466	13	0	523
	2016												
American Plaice	2014	1,981	1,515	30	30	0	1,382		0	1,357	24	0	1,442
	2015	2,021	1,544	31	31	0	1,408		0	1,383	25	0	1,470
	2016												
Witch Flounder	2014	1,512	783	23	117	0	610		0	599	11	0	751
	2015	1,846	783	23	117	0	610		0	599	11	0	751
	2016												
GB Winter Flounder	2014	4,626	3,598	0	108	0	3,385		0	3,364	21	0	3,493
	2015												
	2016												
GOM Winter Flounder	2014	1,458	1,078	272	54	0	714.7		0	688.3	26.4	0	1,040
	2015												
	2016												
SNE/MA Winter Flounder	2014	3,372	1,676	235	168	0	1,210		0	1,074	136	0	1,612
	2015	4,439	1,676	235	168	0	1,210		0	1,074	136	0	1,612
	2016												
Redfish	2014	16,130	11,465	115	229	0	10,565		0	10,523	42	0	10,909
	2015	16,845	11,974	120	239	0	11,034		0	10,990	44	0	11,393
	2016												

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	2014	6,082	4,642	46	93	0	4,278	-	0	4,247	30	0	4,417
	2015	6,237	4,713	47	94	0	4,343		0	4,312	31	0	4,484
	2016	6,314	4,645	46	93	0	4,280		0	4,250	30	0	4,420
Pollock	2014	20,554	16,000	960	1,120	0	13,224		0	13,131	93	0	15,304
	2015												
	2016												
N. Window-pane Flounder	2014	202	151	2	44	0	98		0	0	98	0	144
	2015	202	151	2	44	0	98		0	0	98	0	144
	2016												
S. Window-pane Flounder	2014	730	548	55	186	183	102		0	0	102	0	527
	2015	730	548	55	186	183	102		0	0	102	0	527
	2016												
Ocean Pout	2014	313	235	2	21	0	197		0	0	197	0	220
	2015	313	235	2	21	0	197		0	0	197	0	220
	2016												
Atlantic Halibut	2014	180	109	44	5	0	57		0	0	57	0	106
	2015	198	119	48	6	0	62		0	0	62	0	116
	2016												
Atlantic Wolffish	2014	94	70	1	3	0	62		0	0	62	0	65
	2015	94	70	1	3	0	62		0	0	62	0	65
	2016												

Table 5 – 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	
	2014	2015	2014	2015	2014	2015
GB cod	0.3	0.4	0.1	0.1	0.2	0.3
GOM cod	0.2	0.2				
GB yellowtail flounder	0.03	-			0.03	-
CC/GOM yellowtail flounder	0.1	0.1				
American Plaice	1.2	1.2				
Witch Flounder	0.5	0.5				
SNE/MA winter flounder	1.4	1.4				

Table 6 – FY 2014-2015 CAI Hook Gear Haddock SAP TACs

Year	Exploitable Biomass (thousand mt)	WGB Exploitable Biomass	B(year)/B2004	TAC (mt, live weight)
2014	136,753	47,864	1.752	1,980
2015	169,027	59,159	2.166	2,448

4.2 Commercial and Recreational Fishery Measures

4.2.1 Small-Mesh Fishery Accountability Measures

4.2.1.1 Option 1: No Action

This option would not establish additional accountability measures (AMs) for the small-mesh fishery for Georges Bank (GB) yellowtail flounder under the Multispecies FMP. FW 48 adopted a sub-ACL of GB yellowtail flounder beginning in FY 2013. If the U.S. TAC (equal to the U.S. ABC) for GB yellowtail flounder is exceeded, the U.S./Canada Resource Sharing Understanding requires that the U.S. TAC for the following fishing year be reduced by the amount of the overage. The current regulations specify that this overage deduction would be applied to the component of the fishery that caused the overage. Under this option, if the small-mesh fisheries exceeded their allocation of GB yellowtail flounder, which caused an overage of the U.S. TAC, the small-mesh fishery sub-ACL would be reduced by the amount of the overage the following fishing year. However, because the small-mesh fisheries are prohibited from landing GB yellowtail flounder (discards only), a pound-for-pound reduction of the small-mesh fishery sub-ACL, by itself, may not appropriately correct an overage, or prevent future overages from occurring. Under this option, no corresponding measures would be triggered along with the pound-for-pound payback to constrain GB yellowtail flounder catches by the small-mesh fisheries. If the small-mesh fishery allocation was reduced to zero as a result of an overage payback, or if a quota was not specified for GB yellowtail flounder, there are no restrictions in place under this option that would prevent the small-mesh fisheries from fishing in the Georges Bank yellowtail flounder stock area (statistical areas 522, 525, 561, and 562). Under this option, there would also be no gear modification requirements for the small-mesh fishery in the Georges Bank yellowtail flounder stock area.

4.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL (*Preferred Alternative*)

Two options (one with two sub-options) are being considered for the small-mesh fishery AM. None of these options alter the existing U.S./Canada Resource Sharing Understanding.

Sub-Option A: If the sub-ACL is zero (e.g., due to the pound-for-pound reduction under the US/Canada Understanding as described in Option 1/No Action) for the small-mesh fishery, or a sub-ACL is not specified, then vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches would be prohibited from fishing in the Georges Bank yellowtail flounder stock area (Statistical Areas 522, 525, 561 and 562). Because of the timing of availability of data for this fishery, the AM would be implemented in the fishing year following the notification of the overage.

Sub-Option B1: The AM would be implemented if both the total ACL and the small-mesh fishery sub-ACL for Georges Bank yellowtail flounder are exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of Georges Bank yellowtail flounder. Approved gears include the raised footrope trawl, separator trawl, rope trawl, Ruhle trawl, mini Ruhle trawl, or any other gear authorized by the Council in a management action, or approved for use consistent with the process defined in 50 CFR 648.85 (b)(6). If the AM is implemented, selective trawl gear would be required in the Georges Bank yellowtail flounder stock area (Statistical Areas 522, 525, 561 and 562). The AM would not be implemented in the middle of a fishing year. Should reliable information be available that the total ACL and small-mesh fishery sub-ACL has been exceeded during a fishing year, this AM would be implemented at the start of the next fishing year (Fishing Year 2). However, if the information on an overage for Fishing Year 1 is not available until after the start of Fishing Year 2, then the AM would be implemented at the start of Fishing Year 3. This would be a reactive AM.

Sub-Option B2 (*Preferred Alternative*): The AM would be implemented if the small-mesh fishery sub-ACL of Georges Bank yellowtail flounder is exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of Georges Bank yellowtail flounder. Approved gears include the raised footrope trawl, separator trawl, rope trawl, Ruhle trawl, mini Ruhle trawl, or any other gear authorized by the Council in a management action, or approved by the Regional Administrator through the gear-approval process defined in 50 CFR 648.85 (b)(6). If the AM is implemented, selective trawl gear would be required in the Georges Bank yellowtail flounder stock area (Statistical Areas 522, 525, 561 and 562). The AM would not be implemented in the middle of a fishing year. Should reliable information be available that small-mesh fishery sub-ACL has been exceeded during a fishing year, this AM would be implemented at the start of the next fishing year (Fishing Year 2). However, if the information on an overage for Fishing Year 1 is not available until after the start of Fishing Year 2, then the AM would be implemented at the start of Fishing Year 3. This would be a reactive AM.

Rationale: This AM would ensure that there are sufficient measures in place to reduce catch of GB yellowtail flounder in the small-mesh fisheries in order to mitigate an overage, and help prevent future overages from occurring. Adopting an AM for the small-mesh fisheries also ensures that overages caused by the small-mesh fisheries would not negatively impact other components of the fishery. Triggering the small-mesh fisheries AM based on an overage of the sub-ACL, regardless of whether the total ACL is exceeded, is consistent with how other fisheries are treated (with the exception of the scallop fishery's AM for GB yellowtail flounder). AMs linked to each sub-ACL of the fishery ensures that each component is held responsible for its catch of GB yellowtail flounder.

4.2.2 Management Measures for US/CA TACs

This section considers changing fishery management measures as necessary to adjust catches of US/CA stocks. More than one option can be selected.

4.2.2.1 Option 1: No Action

If this option is adopted, the U.S./Canada TACs would be specified at the beginning of the fishing year, and there would be no in-season adjustments to the U.S./Canada TACs. This option would not consider the quota trading mechanism established by the TMGC and U.S./Canada Steering Committee, and would not allow additional quota to be distributed to the U.S. at the end of the Canadian fishing year (December). Under this option, there would also be no adjustment to the amount of the U.S. TAC for eastern GB haddock that is allocated to the Eastern U.S./Canada Management Area. Eastern GB haddock is a sub-unit of the total GB haddock stock. The amount of the shared U.S./Canada TAC for eastern GB haddock is deducted from the total ABC for GB haddock. Under the current regulations, the U.S. share of eastern GB haddock can only be caught in the eastern U.S./Canada Management Area, and the remaining portion of the total ABC is only available outside of the eastern U.S./Canada Management Area.

4.2.2.2 Option 2: Revised in-season adjustment for US/CA TACs (*Preferred Alternative*)

If this option is adopted, the Regional Administrator would be allowed to adjust the US/CA quotas during the FY, i.e. after allocations were made. Additional quota would be allocated consistent with the current ABC distribution, which would include both groundfish and non-groundfish vessels (i.e., scallops and small-mesh fisheries). The RA would not have the authority to change the allocations to the sub-ACLs during the FY. The RA's authority would be time limited and only exist for trades made by or before the end of the 2014 fishing year.

Prior to changing measures, the NMFS would consult with the Council and would advise the Council what measures were under consideration.

Rationale: The difference in fishing years between the two countries would require adjustments to occur in adjacent years. This measure would allow an adjustment to occur as soon as possible to the end of the Canadian fishing year, potentially providing additional quota for limiting US/CA stocks. The RA's authority would be time limited and only exist for trades made by or before the end of the 2014 fishing year, in order to determine if trades between the US and Canada are practical under this approach.

4.2.2.3 Option 3: Distribution of US TACs for Eastern/Western Georges Bank Haddock (*Preferred Alternative*)

Sub-Option A: If this option is adopted, the Regional Administrator, in consultation with the Council, would be allowed to adjust the portion of the U.S. TAC for Eastern GB haddock that is available in the Eastern U.S./Canada Area. To the extent possible, changes to the amount of GB haddock available in the Eastern U.S./Canada Area would be made prior to the start of the fishing year, and the Council would provide any recommendation concurrent with its recommendations for U.S./Canada TACs for the upcoming fishing year. Any changes would be adopted consistent with the Administrative Procedures Act. This option does not change how Eastern GB haddock stocks is allocated to sectors, or the requirement that vessels can only harvest Eastern GB haddock allocation from the Eastern U.S./Canada Area, while the remaining allocation may only be harvested outside of the Eastern U.S./Canada Area.

Rationale: GB haddock is a subset of the overall GB haddock stock. The total ABC for GB haddock includes the shared U.S./Canada TAC for the Eastern U.S./Canada Area. Under the current approach, only the amount of the GB haddock ABC remaining after deducting the shared TAC for Eastern GB haddock is available to be caught outside of the Eastern U.S./Canada Area. This reduces operational flexibility for commercial groundfish vessels, and could potentially limit fishing outside of the Eastern U.S./Canada Area even if the total GB haddock ACL has not been fully caught. This measure would help increase the use of the GB haddock ACL and improve flexibility for commercial groundfish vessels. Both common pool and sector vessels could be affected.

Sub-Option B (*Preferred Alternative*): A sector, or state-operated permit bank, may convert its Eastern GB haddock ACE to Western GB haddock ACE at any time during the fishing year, and up to 2 weeks into the following fishing year (unless otherwise instructed by NMFS) to cover any overage during the previous fishing year. The proposed ACE conversion will be referred to, and approved by, NMFS based on general issues, such as whether the applicant is complying with reporting or other administrative requirements, and, based on these factors, would notify the applicant if the conversion is approved or disapproved. The responsibility for ensuring that sufficient ACE is available to cover the conversion is the responsibility of the sector or permit bank. A GB haddock ACE conversion from the Eastern to Western U.S./Canada Area may only be made within a sector or permit bank, and not between sectors or permit banks. Once a portion of Eastern GB haddock ACE has been converted to Western GB haddock ACE by a sector or permit bank, that portion of ACE remains Western GB haddock ACE for the remainder of the fishing year. Western GB ACE may not be transferred to the Eastern US/Canada Area at any time.

Rationale: This measure provides additional flexibility to harvest GB haddock allocation. Eastern GB haddock is a sub-unit of the overall GB haddock stock, and the total ABC for GB haddock includes the shared U.S./Canada TAC for the Eastern U.S./Canada Area. Sectors and state-operated permit banks receive two allocations of GB haddock ACE, an Eastern GB haddock ACE and a Western GB haddock ACE. Currently, Eastern GB haddock ACE can only be harvested in the Eastern U.S./Canada Area, and the remaining portion of a sector's total GB haddock allocation can only be caught in the Western U.S./Canada Area. This caps the amount of GB haddock that a sector can catch in the Eastern Area to ensure that the U.S. does not exceed its TAC for Eastern GB haddock. However, limiting the amount of haddock that could be caught in the Western area may unnecessarily reduce flexibility, and potentially limits fishing in the Western U.S./Canada Area even if a sector has not caught its entire allocation of GB haddock.

This measure does not jeopardize the total ACL for GB haddock, or the Eastern U.S. TAC. This measure does not change any existing sector requirements that a sector must cease operations in a stock area once its ACE is caught until it can acquire additional ACE through a transfer. This measure also does not change the existing ACE transfer provisions. Permit banks would also be allowed the same flexibility, consistent with how the Council has authorized permit banks to transfer ACE.

4.2.3 Georges Bank Yellowtail Flounder Management Measures

4.2.3.1 Option 1: No Action

If this option would be adopted, there would be no changes to the management measures for GB yellowtail flounder for estimating discards. When estimating discards of GB yellowtail flounder for the purposes of groundfish quota monitoring, if this option is adopted there would be one area used as the basis for discard monitoring. This area would match the existing stock boundaries for the stock. Further stratification would only be for sector, gear and mesh.

Rationale: This No Action option would not make any changes to existing measures that address GB yellowtail flounder. The area stratification scheme used for monitoring discards would be consistent with that used in the assessment of this stock.

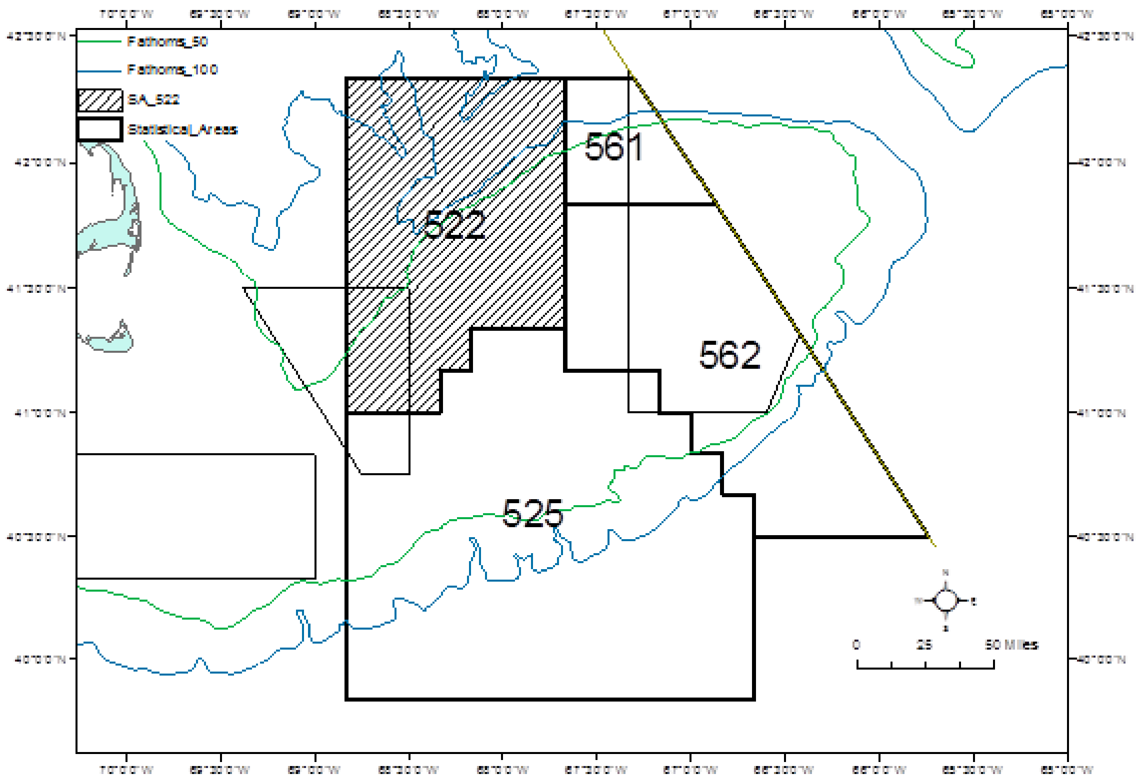
4.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder (*Preferred Alternative*)

This option would modify the stratification used for estimating discards of GB yellowtail flounder for in-season quota monitoring of sector catches. It would not change the stratification used in assessments, nor would it change the stratification used to monitor common pool fishing trips. If adopted, yellowtail flounder discards on groundfish trips would be calculated for two different areas: statistical area 522 and all other GB yellowtail flounder statistical areas. The areas are shown in Figure 1.

This approach would be used for all groundfish gear. It would not change the stratification method for other groundfish stocks. Yellowtail flounder is primarily caught by trawl gear. If the Regional Administrator determines that this additional stratification is not needed for other, non-trawl gears, then the stratification method can be modified to exclude those gears using procedures consistent with the APA.

Rationale: Yellowtail flounder are primarily caught in the shallower waters of GB. SA 522 includes a large area of deeper water where groundfish vessels target haddock and other species. Catch rates of yellowtail flounder are lower in this area than in the other statistical areas. By treating this as a different discard stratum for yellowtail flounder, the discard rate of GB yellowtail flounder that is applied to unobserved trips will more accurately reflect what occurs in this area, and will not be influenced by fishing activity in the other areas. This should allow more fishing in this area without exceeding allocations of GB yellowtail flounder. This is primarily an issue for trawl vessels, and the Regional Administrator can choose not to apply this approach to other gears if deemed unnecessary. This stratification scheme would not be adopted for common pool fishing trips because the small number of these trips would lead to inadequate trips to estimate an in-season discard rate.

Figure 1 – Proposed Change in Discard Strata for GB Yellowtail Flounder



4.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

4.2.4.1 Option 1: No Action

For limited access scallop fishery vessels, there would be no trip limit for yellowtail flounder stocks (GB and SNE/MA) and limited access scallop vessels will be required to land all legal-sized yellowtail flounder that is caught, as established in FW44 to the Groundfish FMP. Note that the retention does not apply to General Category/IFQ vessels.

Rationale: Due to concerns about discarding yellowtail flounder, this option would maintain accountability for catches of this stock and the disincentive to target yellowtail flounder.

4.2.4.2 Option 2: Prohibition on possession of yellowtail flounder (*Preferred Alternative*)

For limited access scallop fishery vessels, there would be zero possession of yellowtail flounder stocks (GB and SNE/MA). Under this option, yellowtail flounder could not be landed or sold by the limited access scallop fishery. This option would not change existing regulations for the General Category/IFQ vessels.

Rationale: Because of expected low quotas for GB yellowtail flounder, creating a prohibition on the possession of yellowtail flounder by the limited access scallop fishery would remove the incentive to target flounders since they could not be retained and sold. Compliance in the limited access fishery with respect to Option 1/No Action has been low thus expected beneficial impacts such as reduced yellowtail bycatch and improved data have likely been limited. In addition, there is some evidence that a very small number of limited access scallop vessels actually targeted yellowtail flounder under the requirement to land legal size yellowtail flounder.

5.0 Alternatives Considered and Rejected

5.1 Commercial and Recreational Fishery Measures

5.1.1 Commercial Fishery Restrictions

5.1.1.1 Option 1: No Action

If this action is adopted, there will be no revision to the regulations regarding landings of the allocated regulated groundfish currently managed. The following minimum fish size regulations would apply unless changed in this or a future action.

Table 7 - No Action Minimum Fish Sizes (TL) for Commercial Vessels

Species	Size (inches)
Cod	19 in. (48.3 cm)
Haddock	16 in. (40.6 cm)
Pollock	19 in. (48.3 cm)
Witch Flounder (gray sole)	13 in. (33 cm)
Yellowtail Flounder	12 in. (30.5 cm)
American Plaice (dab)	12 in. (30.5 cm)
Atlantic Halibut	41 in. (104.1 cm)
Winter Flounder (blackback)	12 in. (30.5 cm)
Redfish	7 in. (17.8 cm)

Rationale: Since implementation in 1986, the Northeast Multispecies FMP has used minimum size limits in conjunction with gear requirements to reduce catches of sub-adult fish. When adopted the purpose of this measure was to provide opportunities for fish to spawn before harvest, as well as to reduce the incentive to use illegal mesh to increase catches.

5.1.1.2 Option 2: Full Retention

If this action is adopted all allocated, currently regulated groundfish of all sizes, including cod, haddock, white hake, pollock, Acadian redfish, yellowtail flounder, Georges Bank and Gulf of Maine winter flounder, witch flounder, and American plaice, must be retained by sector vessels, i.e. no discarding of non-prohibited fish. Discarding of non-allocated groundfish species, including those that require no-retention as part of a rebuilding program would continue. Allocated regulated groundfish that are physically damaged, e.g. by predation, must be retained. This action would not alter regulated mesh areas or restrictions on gear and methods of fishing. This measure would not change possession requirements for other species that are regulated by other Fishery Management Plans.

This option would facilitate a reduction in the dependence on the assumed discard rate applied to sector vessels before a calculated discard rate is available. To ensure this option would convert discards to landings, catch accountability should be maximized. This could include one hundred percent dockside monitoring and one hundred percent at-sea monitoring in the form of at-sea monitors and/or electronic monitoring, if electronic monitoring is deemed sufficient.

It should be noted that this change would be made to reduce regulatory discards, not to facilitate targeting of smaller fish. As a result, while sectors would not be prohibited from requesting exemptions from minimum mesh requirements, the expectation is that before such a request would be approved a sector would have to explain why such an exemption would not lead to increased targeting of juvenile groundfish.

Sub-Option A: If this sub-option is adopted it would establish full retention as outlined above on a subset of fishing vessels based on gear type. This program would require one hundred percent dockside monitoring and one hundred percent at-sea monitoring in the form of electronic monitoring and/or at-sea monitors.

Rationale: Electronic monitoring is considered an economical tool to monitor fishing activities but requires testing before broad scale application across gear types. This program would help to evaluate electronic monitoring as a primary tool for observing on a smaller portion of the fleet.

5.2 Small-Mesh Fishery Measures

5.2.1.1 Option 1: No Action

This option would not change existing pre-trip call-in requirements for small-mesh fisheries. Currently, the long-fin squid fishery (on trips landing more than 2,500 lbs) is required to use the Pre-Trip Notification System (PTNS). Beginning in January 2014, the mackerel fishery (through Amendment 14 to the Squid, Mackerel, and Butterfish Fishery Management Plan) would also be required to make a 48-hr pre-trip notification for all trips landing more than 20,000 lbs of mackerel). However, under this option, no other small-mesh fisheries (e.g., whiting) have any pre-trip notification requirements. Trips that target a mix of stocks (e.g., a mixed trip for whiting and greater than 2,500 lbs of long-fin squid) would be subject to a pre-trip notification requirement.

5.2.1.2 Option 2: Call-in Requirement for Small-Mesh Fisheries

This option would require small-mesh fisheries in the Georges Bank yellowtail flounder stock area (522, 525, 561,or 562) to request an observer prior to leaving the dock for a trip. This option would be in addition to any existing pre-trip call-in requirements for small-mesh fisheries.

Rationale: Small-mesh bottom trawl vessels fishing in the Georges Bank yellowtail flounder stock area would be subject to similar requirements of other fisheries being prosecuted in the same area. Requesting an observer prior to the start of a trip could be accomplished through PTNS. The vessel could not leave the dock until the vessel notified of intent to fish in the GB yellowtail flounder stock area, and received a response as to whether or not an observer would potentially be assigned to the trip. This option was considered to be more appropriately developed under the Whiting FMP.

5.3 Management Measures for US/CA TACs

5.3.1.1 Option 3: Revised in-season adjustment for US/CA TACs

If this option is adopted, the Regional Administrator would be allowed to adjust the US/CA quotas during the FY, i.e. after allocations were made. Additional quota would be distributed consistent with the sector sub-ACL distribution.

Prior to changing measures, the NMFS would consult with the Council and would advise the Council what measures were under consideration.

Rationale: The difference in fishing years between the two countries would require adjustments to occur in adjacent years. This measure would allow an adjustment to occur as soon as possible to the end of the Canadian fishing year, potentially providing additional quota for limiting US/CA stocks. This distribution scheme would consider traded quota as additional groundfish quota that contributes to solely to sector ACE. This Option would require an amendment and cannot be completed in this framework; the Council expects to address this under Amendment 18 to the Multispecies FMP.

5.3.1.2 Option 4: Revised in-season adjustment for US/CA TACs

If this option is adopted, the Regional Administrator would be allowed to make transboundary quota trades of groundfish quota only with components of the fishery trading away their quota. Any groundfish quota resulting from a trade with Canada would go only to the groundfish fishery.

Rationale: This option would ensure that individuals trading quota would directly receive quota in return. Both common pool and sector vessels could be affected by this trade. This Option would require an amendment and cannot be completed in this framework; the Council expects to address this under Amendment 18 to the Multispecies FMP.

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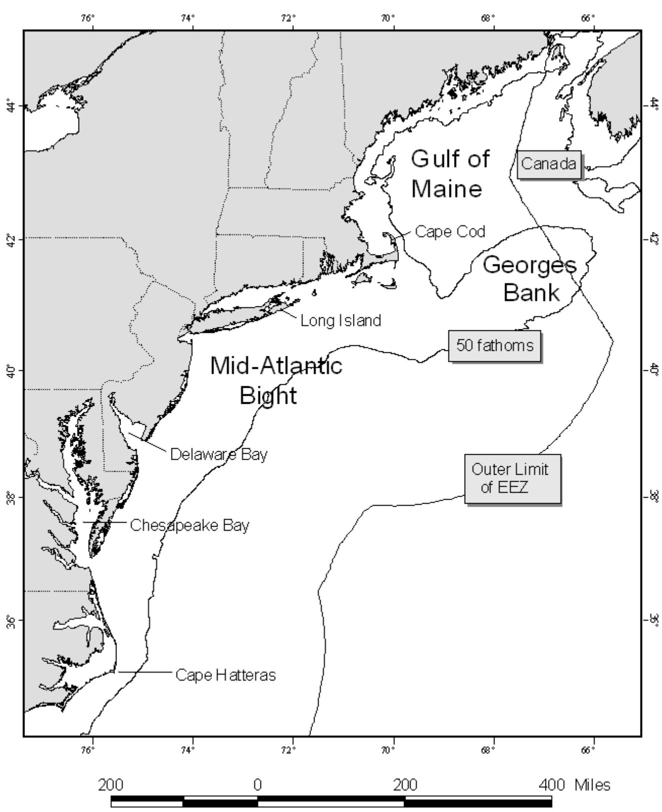
6.0 Affected Environment

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 2) 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).

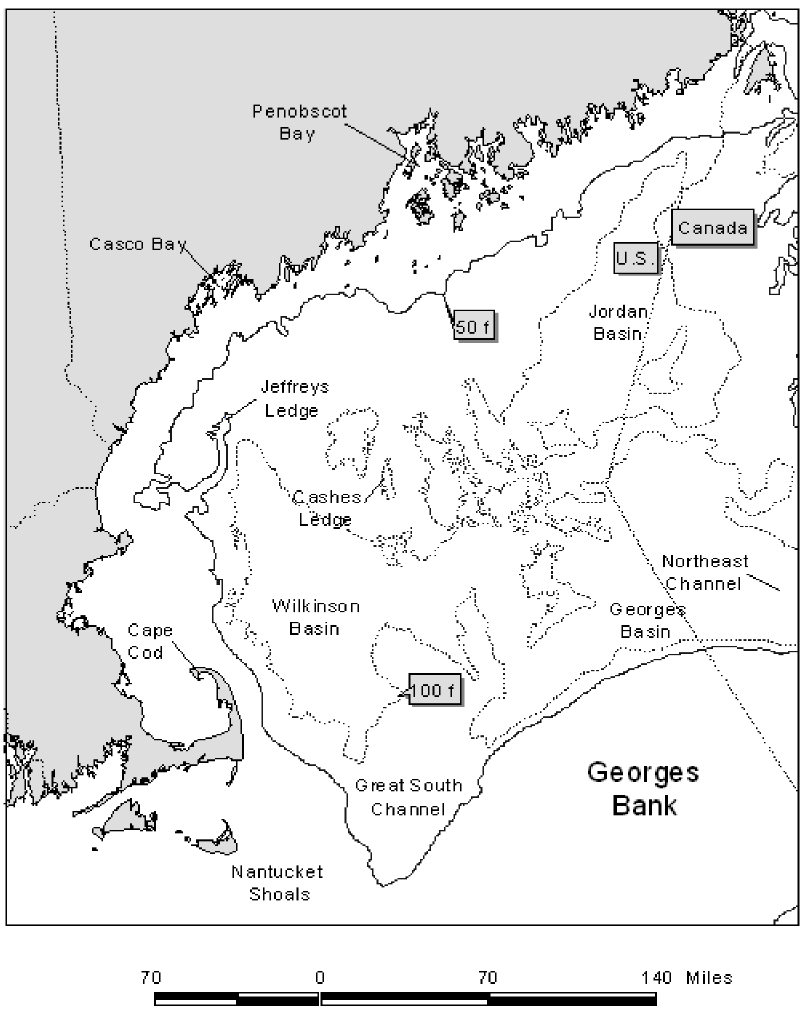
Figure 2 – Northeast U.S. Shelf Ecosystem



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 3). 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 3 – 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 subregion 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 8 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 8). 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 8.

Table 8 – 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

			Essential Fish Habitat		
Species	**Geographic Region of the Northwest Atlantic**	**Food Source**	**Water Depth**	**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 & crustaceans	(E): <164 ft. (<50 m)	(E): Bottom habitats, generally hard bottom sheltered nests, holes or crevices where juveniles are guarded	Otter trawl

			(L): <164 ft. (<50 m) (J): 262 ft. (<80 m) (A): 361 ft. (<110 m)	(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 &	Mollusks, brittle	(J): 131,2-787.4	(J): Rocky	Otter trawl,

	Georges Bank	stars, crabs, and sea urchins	ft. (40-240 m)	bottom and coarse sediments	bottom longlines, and gillnets
			(A): 131.2-787.4 ft. (40-240 m)	(A): Same as for (J)	
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)	(J): Bottom habitats with substrate of mud or fine grained sand	Otter trawl
			(A): 3.2-574 ft. (1-75 m)	(A): Same as for (J)	

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 8 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

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) as part of the FY 2013 operations. 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 9 - 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 <u>changes that may be permanent</u> 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.

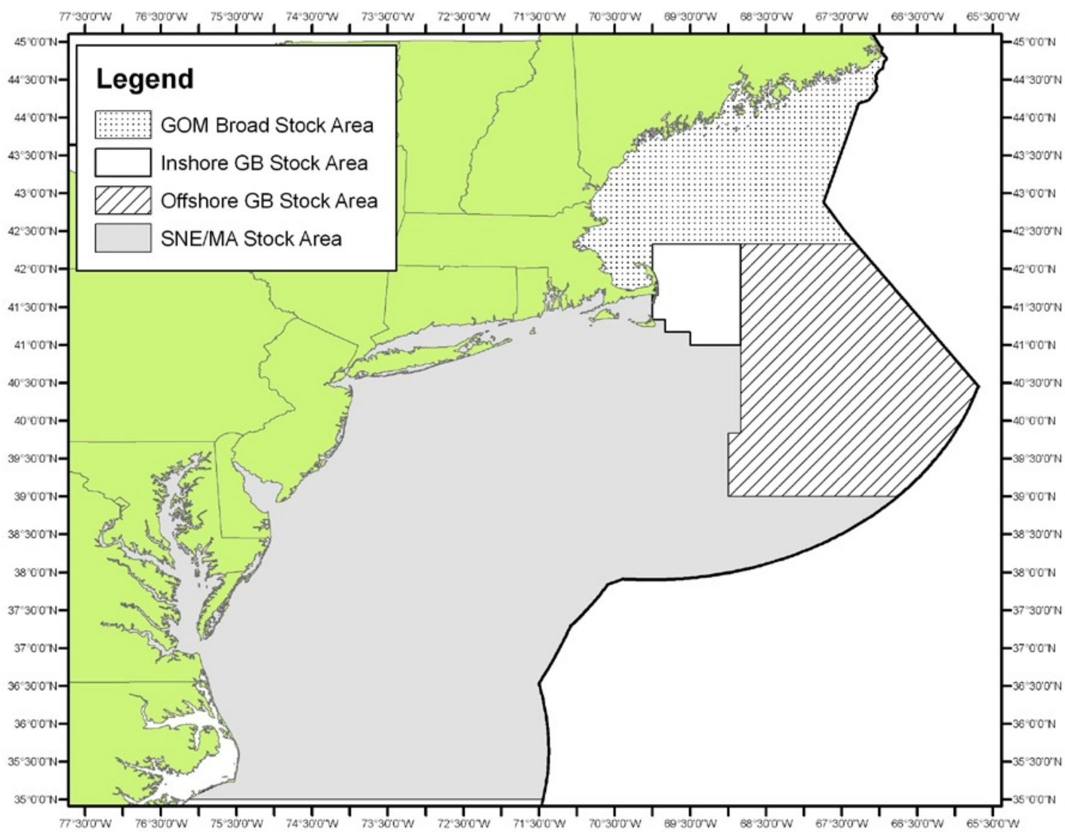
6.2 Groundfish Species

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. 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 4 - 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 2010 biomass estimate, the most recent estimate available, was 8 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 but overfishing is occurring. The stock size has been decreasing and is approaching an overfished condition. Should the stock size drop below the minimum stock size threshold, a formal stock rebuilding program would need to be put in place.

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.

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: GB yellowtail flounder is overfished, and overfishing is occurring.

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 subject to overfishing, is not overfished, and was declared rebuilt in 2010.

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 2013a).

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 10 (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 10 vary slightly between the two studies. For further information on fish habitat relationships, see Table 8.

Table 10 - 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 8 summarizes the status of the northeast groundfish stocks.

Table 11 - Status of the Northeast Groundfish Stocks for fishing year 2014

Stock Status	Stock (assessment source)
Overfished and Overfishing 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)
Overfished but not Overfishing Biomass < ½ B_{MSY} and F ≤ F_{MSY}	Ocean Pout (assessment update) Atlantic Halibut (assessment update) GOM Winter Flounder (SARC 52)[b] Atlantic wolffish (assessment update) SNE/MA Winter Flounder
Not Overfished but Overfishing Biomass ≥ ½ B_{MSY} and F >	GOM Haddock (assessment update)
Not Overfished and not Overfishing Biomass ≥ ½ B_{MSY} and F ≤ F_{MSY}	Pollock (SARC 50) Acadian Redfish (assessment update) SNE/MA yellowtail flounder (SARC 54) American Plaice (assessment update) 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,

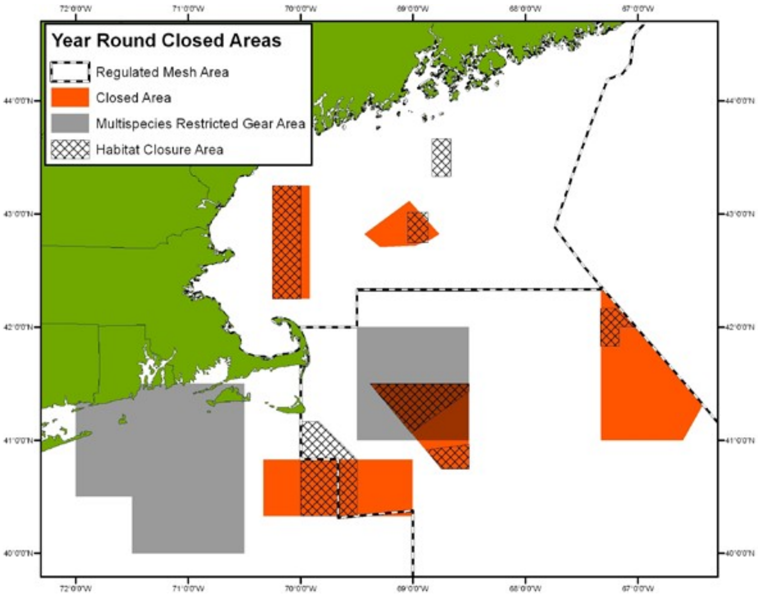
Northeast Fisheries Science Center. 2012. Assessment or Data Updates of 13 Northeast Groundfish Stocks through 2010. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-06; 789 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026

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 5 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 8). In many cases, these closed areas overlap portions of the groundfish mortality closures (see Figure 5). 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 5 - 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 16 shows that otter trawl gear caught the majority of non-allocated target species and bycatch between FY 1996 to FY 2006.

Table 12 – 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 Porr Stocks Working Group 2007b; Sosebee et al. 2008; NEFSC 2006a.

6.4 Protected Resources

Numerous protected species inhabit the environment within the Northeast Multispecies FMP management unit. Therefore, many protected species potentially occur in the operations area of the fishery. 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). As listed in Table 13, 17 marine mammal, sea turtle, and fish species are classified as endangered or threatened under the ESA, one other is a candidate species under the ESA. The remaining species in Table 13 are protected by the MMPA and are known to interact with the Northeast multispecies fishery. Non ESA-listed species protected by the MMPA that utilize this environment and have no documented interaction with the Northeast multispecies fishery will not be discussed in this document.

6.4.1 Species Present in the Area

Table 13 lists the species, protected either by the ESA, the MMPA, or both, that may be found in the environment utilized by sectors. Table 13 also includes one candidate fish species, as identified under the ESA.

Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA. Candidate species 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; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. NMFS has initiated review of recent stock assessments, bycatch information, and other information for these candidate and proposed species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information reviews. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10).

Table 13 - Species Protected Under the Endangered Species Act and/or Marine Mammal Protection Act that May Occur in the Operations Area for the FY 2014 Sectors[a]

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

Notes:

[a] MMPA-listed species occurring on this list are only those species that have a history of interaction with similar gear types within the action area of the Northeast Multispecies Fishery, as defined in the 2012 List of Fisheries.

[b] Bottlenose dolphin (*Tursiops truncatus*), Western North Atlantic coastal stock is listed as depleted.

[c] 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.

6.4.2 Species Potentially Affected

The multispecies fishery has the potential to affect the fish, sea turtle, cetacean, and pinniped species discussed below. A number of documents contain background information on the range-wide status of the protected species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and bottom longlines). These documents include sea turtle status reviews and biological reports (NMFS and USFWS 1995; Turtle Expert Working Group 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b, recovery plans for ESA-listed cetaceans and sea turtles (NMFS 1991, 2005; NMFS and USFWS 1991a, 1991b; NMFS and USFWS 1992), the marine mammal stock assessment reports (e.g., Waring et al. 1995; 2011, 2013), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002, ASSRT 2007).

6.4.2.1 Sea Turtles

Loggerhead, leatherback, Kemp's ridley, and green sea turtles occur seasonally in southern New England and Mid-Atlantic continental shelf waters north of Cape Hatteras, North Carolina. Turtles generally move up the coast from southern wintering areas as water temperatures warm in the spring (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). A reversal of this trend occurs in the fall when water temperatures cool. Turtles pass Cape Hatteras by December and return to more southern waters for the winter (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). Hard-shelled species typically occur as far north as Cape Cod whereas the more cold-tolerant leatherbacks occur in more northern Gulf of Maine waters in the summer and fall (Shoop and Kenney 1992, STSSN database http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp).

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

On September 22, 2011, NMFS and USFWS issued a final rule (76 FR 58868), determining that the loggerhead sea turtle is composed of nine DPSs (as defined in Conant *et al*., 2009) that constitute species that may be listed as threatened or endangered under the ESA. Five DPSs were listed as endangered (North Pacific Ocean, South Pacific Ocean, North Indian Ocean, Northeast Atlantic Ocean, and Mediterranean Sea), and four DPSs were listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southeast Indo-Pacific Ocean, and Southwest Indian Ocean). Note that the Northwest Atlantic Ocean (NWA) DPS and the Southeast Indo-Pacific Ocean DPS were original proposed as endangered.

The NWA DPS was determined to be threatened based on review of nesting data available after the proposed rule was published, information provided in public comments on the proposed rule, and further discussions within the agencies. The two primary factors considered were population abundance and population trend. NMFS and USFWS found that an endangered status for the NWA DPS was not warranted given the large size of the nesting population, the overall nesting population remains widespread, the trend for the nesting population appears to be stabilizing, and substantial conservation efforts are underway to address threats.

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

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

60° N latitude, and west of 40° W longitude; Northeast Atlantic Ocean (NEA) DPS – north of the equator, south of 60° N latitude, east of 40° W longitude, and west of 5° 36' W longitude; South Atlantic DPS – south of the equator, north of 60° S latitude, west of 20° E longitude, and east of 60° W longitude; Mediterranean DPS – the Mediterranean Sea east of 5° 36' W longitude. These boundaries were determined based on oceanographic features, loggerhead sightings, thermal tolerance, fishery bycatch data, and information on loggerhead distribution from satellite telemetry and flipper tagging studies. Sea turtles from the NEA DPS are not expected to be present over the North American continental shelf in U.S. coastal waters, where the proposed action occurs (P. Dutton, NMFS, personal communication, 2011). Previous literature (Bowen *et al*. 2004) has suggested that there is the potential, albeit small, for some juveniles from the Mediterranean DPS to be present in U.S. Atlantic coastal foraging grounds. These data should be interpreted with caution however, as they may be representing a shared common haplotype and lack of representative sampling at Eastern Atlantic rookeries. Given that updated, more refined analyses are ongoing and the occurrence of Mediterranean DPS juveniles in U.S. coastal waters is rare and uncertain, if even occurring at all, for the purposes of this assessment we are making the determination that the Mediterranean DPS is not likely to be present in the action area. Sea turtles of the South Atlantic DPS do not inhabit the action area of this subject fishery (Conant *et al*. 2009). As such, the remainder of this assessment will only focus on the NWA DPS of loggerhead sea turtles, listed as threatened.

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

6.4.2.2 Large Cetaceans

The most recent Marine Mammal Stock Assessment Report (SAR) (Waring et al. 2013), covering the time period between 2006 and 2010, reviewed the current population trend for each of these cetacean species within U.S. Economic Exclusion Zone (EEZ) waters. The SAR also estimated annual human-caused mortality and serious injury. Finally, it described the commercial fisheries that interact with each stock in the U.S. Atlantic. The following paragraphs summarize information from the SAR.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke whales) follow a general annual pattern of migration. They migrate from high latitude summer foraging grounds, including the Gulf of Maine and Georges Bank, to low latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is a simplification of species movements as the complete winter distribution of most species is unclear (Perry et al. 1999; Waring, et al. 2012). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002). Blue whales are most often sighted along the east coast of Canada, particularly in the Gulf of St. Lawrence. They occur only infrequently within the U.S. EEZ (Waring et al. 2002).

North Atlantic right whales are federally listed as endangered under the ESA and a revised recovery plan was published in June 2005. Available information suggests that the North Atlantic right whale population increased at a rate of 2.6 percent per year between 1990 and 2009. The total number of North Atlantic right whales is estimated to be at least 444 animals in 2009. The minimum rate of annual human-caused mortality and serious injury to right whales averaged 3.0 mortality or serious injury incidents per year during 2006 to 2010. Of these, fishery interactions resulted in an average of 2.4 mortality or serious injury incidents per year, all in U.S. waters. The potential biological removal (PBR) level for this stock is 0.9 animals per year (Waring et al. 2013). The Potential Biological Removal (PBR) level is the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

Humpback whales are also listed as endangered under the ESA, and a recovery plan was published for this species in 1991. The North Atlantic population of humpback whales is conservatively estimated to be 7,698. The best estimate for the GOM stock of humpback whale population is 823 whales and current data suggest that the Gulf of Maine humpback whale stock is steadily increasing in size. The minimum rate of annual human-caused mortality and serious injury to humpback whales averaged 7.8 mortality or serious injury incidents per year during 2006 to 2010. Of these, fishery interactions resulted in an average of 5.8 mortality or serious injury incidents per year (5.2 from U.S. waters and 0.6 from Canadian waters). The PBR for this stock is 2.7 animals per year (Waring et al. 2013).

Fin, sei, and sperm whales are all federally listed as endangered under the ESA, with recovery plans currently in place. Based on data available for selected areas and time periods, the minimum population estimates for these western North Atlantic whale stocks are 3,522 fin whales and 357 sei whales (Nova Scotia stock) (Waring et al. 2013) The best recent abundance estimate for sperm whales is the result of the 2011 survey – 1,593 (CV=0.36). The minimum population estimate for the western North Atlantic sperm whale is 1,187 (Waring et al. 2013). Insufficient information exists to determine population trends for these large whale species.

The minimum rate of annual human-caused mortality and serious injury to fin whales averaged 2.0 mortality or serious injury incidents per year during 2006 to 2010. Of these, fishery interactions resulted in an average of 0.8 mortality or serious injury incidents per year (0.6 from U.S. waters and 0.2 from Canadian waters; Waring et al. 2013). The PBR for this stock is 5.6 animals per year. For sei whales, the minimum rate of annual human-cause mortality and serious injury averaged 1.2 per year, of which 0.6 were a result of fishery interactions (Waring et al. 2013). PBR for the Nova Scotia sei whale stock is 0.5 (Waring et al. 2013). For both fin and sei whales, these estimates are likely biased low due to the low detection rate for these species. During 2006-2010, annual average human caused mortality was 0.6 (Waring et al. 2013); sperm whales have not been documented as bycatch in the observed US Atlantic commercial fisheries. PBR for this stock is 2.4 animals per year (Waring et al. 2013).

Minke whales are not ESA-listed but are protected under the MMPA, with a minimum population estimate of 20,741 animals for the Canadian east coast stock (Waring et al. 2013). The minimum rate of annual human-caused mortality and serious injury averaged 5.0 per year during 2006 to 2010, and of these, 2.6 animals per year were recorded through observed fisheries and 1.0 per year were attributed to U.S. fisheries using stranding and entanglement data (Waring et al. 2013). PBR for this stock is 162 animals per year.

More details on fisheries interactions with these species, as well as management actions in place to reduce entanglement risk, can be found in Section 6.4.4.

6.4.2.3 Small Cetaceans

There is fishing related mortality of numerous small cetacean species (dolphins, pilot whales, and harbor porpoises) associated with Northeast Multispecies fishing gear. Seasonal abundance and distribution of each species off the coast of the Northeast U.S. varies with respect to life history characteristics. Some species such as white-sided dolphins and harbor porpoises primarily occupy continental shelf waters. Other species such as the Risso's dolphin occur primarily in continental shelf edge and slope waters. Still other species like the common dolphin and the spotted dolphin occupy all three habitats. Waring et al. (2013) summarizes information on the distribution and geographic range of western North Atlantic stocks of each species.

The most commonly observed small cetaceans recorded as bycatch in multispecies fishing gear (e.g., gillnets and trawls) are harbor porpoises, white-sided dolphins, common dolphins, and pilot whales. These species are described in a bit more detail here. Harbor porpoises are found seasonally within New England and Mid-Atlantic waters. In the Mid-Atlantic, porpoises are present in the winter/spring (typically January through April) and in southern New England waters from December through May. In the Gulf of Maine, porpoises occur largely from the fall through the spring (September through May) and in the summer are found in northern Maine and through the Bay of Fundy and Nova Scotia area. White-sided dolphin distribution shifts seasonally, with a large presence from Georges Bank through the Gulf of Maine from June through September, with intermediate presence from Georges Bank through the lower Gulf of Maine from October through December. Low numbers are present from Georges Bank to Jeffrey's Ledge from January through May. Common dolphins are widely distributed over the continental shelf from Maine through Cape Hatteras, North Carolina. From mid- January to May they are dispersed from North Carolina through Georges Bank, and then move onto Georges Bank and the Scotia shelf from the summer to fall. They are occasionally found in the Gulf of Maine. Pilot whales are generally distributed along the continental shelf edge off the northeastern U.S. coast in the winter and early spring. In late spring, they move onto Georges Bank and into the Gulf of Maine and remain until late fall. They do occur along the Mid-Atlantic shelf break between Cape Hatteras, North Carolina and New Jersey. Since pilot whales are difficult to differentiate at sea, they are generally considered *Globicephala* sp. when they are recorded at sea (Waring et al. 2013).

6.4.2.4 Pinnipeds

Harbor seals have the most extensive distribution of the four species of seal expected to occur in the area. Harbor seals sighting have occurred far south as 30° N (Katona et al. 1993; Waring et al. 2013). Their approximate year-round range extends from Nova Scotia, through the Bay of Fundy, and south through Maine to northern Massachusetts. Their more seasonal range (September through May) extends from northern Massachusetts south through southern New Jersey, and stranding records indicate occasional presence of harbor seals from southern New Jersey through northern North Carolina (Waring et al. 2013). Gray seals are the second most common seal species in U.S. EEZ waters. They occur from Nova Scotia through the Bay of Fundy and into waters off of New England (Katona et al. 1993; Waring et al. 2013) year-round from Maine through southern Massachusetts. A more seasonal distribution of gray seals occurs from southern Massachusetts through southern New Jersey from September through May. Similar to harbor seals, occasional presence from southern New Jersey through northern North Carolina indicate occasional presence of gray seals in this region (Waring et al. 2013). Pupping for both species occurs in both U.S. and Canadian waters of the western North Atlantic. The majority of harbor seal pupping is thought to occur in U.S. waters. While there are at least three gray seal pupping colonies in U.S., the majority of gray seal pupping likely occurs in Canadian waters. Observations of harp and hooded seals are less common in U.S. EEZ waters. Both species form aggregations for pupping and breeding off eastern Canada in the late winter/early spring. They then travel to more northern latitudes for molting and summer feeding (Waring et al. 2006; Waring et al. 2013). Both species have a seasonal presence in U.S. waters from Maine to New Jersey, based on sightings, stranding, and fishery bycatch information (Waring et al. 2013).

6.4.2.5 Atlantic Sturgeon

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

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT 2007). Based on data through 1998, an estimate of 863 spawning adults per year was developed for the Hudson River (Kahnle *et al*. 2007), and an estimate of 343 spawning adults per year is available for the Altamaha River, GA, based on data collected in 2004-2005 (Schueller and Peterson 2006). Data collected from the Hudson River and Altamaha River studies cannot be used to estimate the total number of adults in either subpopulation, since mature Atlantic sturgeon may not spawn every year, and it is unclear to what extent mature fish in a non-spawning condition occur on the spawning grounds. Nevertheless, since the Hudson and Altamaha Rivers are presumed to have the healthiest Atlantic sturgeon subpopulations within the United States, other U.S. subpopulations are predicted to have fewer spawning adults than either the Hudson or the Altamaha (ASSRT 2007). It is also important to note that the estimates above represent only a fraction of the total population size as spawning adults comprise only a portion of the total population (e.g., this estimate does not include subadults and early life stages).

A status review for Atlantic sturgeon was completed in 2007 which indicated that five distinct population segments (DPS) of Atlantic sturgeon exist in the United States (ASSRT 2007). On October 6, 2010, NMFS proposed listing these five DPSs of Atlantic sturgeon along the U.S. East Coast as either threatened or endangered species (75 FR 61872 and 75 FR 61904). A final listing was published on February 6th, 2012 (77 FR 5880 and 75 FR 5914). The GOM DPS of Atlantic sturgeon has been listed as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon have been listed as endangered. Atlantic sturgeon from any of the five DPSs could occur in areas where the multispecies fishery operates Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (ASMFC 2007; Stein et al. 2004). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon. Sturgeon deaths were rarely reported in the otter trawl observer dataset , as well as sink gillnet and drift gillnet gear (ASMFC 2007).

Since the ESA listing of Atlantic sturgeon, the NEFSC has completed new population estimates using data from the Northeast Area Monitoring and Assessment (NEAMAP) survey (Kocik et al. 2013). Atlantic sturgeon are frequently sampled during the NEAMAP survey. NEAMAP has been conducting trawl surveys from Cape Cod, Massachusetts to Cape Hatteras, North Carolina in near shore waters at depths to 18.3 meters (60 feet) during the fall since 2007, and depths up to 36.6 meters (120 feet) during the spring since 2008 using a spatially stratified random design with a total of 35 strata and 150 stations per survey. The information from this survey can be directly used to calculate minimum swept area population estimates during the fall, which range from 6,980 to 42,160 with coefficients of variation between 0.02 and 0.57 and during the spring, which range from 25,540 to 52,990 with coefficients of variation between 0.27 and 0.65. These are considered minimum estimates because the calculation makes the unlikely assumption that the gear will capture 100% of the sturgeon in the water column along the tow path. Efficiencies less than 100% will result in estimates greater than the minimum. The true efficiency depends on many things including the availability of the species to the survey and the behavior of the species with respect to the gear. True efficiencies much less than 100% are common for most species. The NEFSC's analysis also calculated estimates based on an assumption of 50% efficiency, which reasonably accounts for the robust, yet not complete sampling of the Atlantic sturgeon, oceanic temporal and spatial ranges, and the documented high rates of encounter with NEAMAP survey gear and Atlantic sturgeon. For this analysis NMFS has determined that the best available scientific information for the status of Atlantic sturgeon at this time are the population estimates derived from NEAMAP swept area biomass (Kocik et al. 2013) because the estimates are derived directly from empirical data with few assumptions. NMFS has determined that using the median value of the 50% efficiency as the best estimate of the Atlantic sturgeon ocean population is most appropriate at this time. This results in a total population size estimate of 67,776 fish, which is considerably higher than the estimates that were available at the time of listing. This estimate is the best available estimate of Atlantic sturgeon abundance at the time of this analysis. The ASMFC has begun work on a benchmark assessment for Atlantic sturgeon to be completed in 2014, which would be expected to provide an updated population estimate and stock status. The ASMFC is currently collecting public submissions of data for use in the assessment: http://www.asmfc.org/uploads/file/pr20AtlSturgeonStockAssmtPrep.pdf.

6.4.3 Species and Habitats Not Likely to be Affected

NMFS has determined that the action being considered in this EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Further, the action considered in this EA is not likely to adversely affect North Atlantic right whale (Section 6.4.2.2) critical habitat. The following discussion provides the rationale for these determinations.

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. Although, the species is possibly extirpated from the Saint Johns River system. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while some northern populations are amphidromous (NMFS 1998). Since sectors would not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, it is highly unlikely that sectors would affect shortnose sturgeon.

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. Juvenile salmon in New England rivers typically migrate to sea in spring after a one- to three-year period of development in freshwater streams. They remain at sea for two winters before returning to their U.S. natal rivers to spawn (Kocik & Sheehan 2006). Results from a 2001-2003 post-smolt trawl survey in the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid to late May (Lacroix, Knox, and Stokesbury 2005). Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the action being considered will affect the Gulf of Maine DPS of Atlantic salmon given that operation of the multispecies fishery does not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found. Additionally, multispecies gear operates in the ocean at or near the bottom rather than near the surface where Atlantic salmon are likely to occur. Thus, this species will not be considered further in this EA.

North Atlantic right whales occur in coastal and shelf waters in the western North Atlantic (NMFS 2005). Section 6.4.4 discusses potential fishery entanglement and mortality interactions with North Atlantic right whale individuals. The western North Atlantic population in the U.S. primarily ranges from winter calving and nursery areas in coastal waters off the southeastern U.S. to summer feeding grounds in New England waters (NMFS 2005). North Atlantic Right Whales use five well-known habitats annually, including multiple in northern waters. These northern areas include the Great South Channel (east of Cape Cod); Cape Cod and Massachusetts Bays; the Bay of Fundy; and Browns and Baccaro Banks, south of Nova Scotia. NMFS designated the Great South Channel and Cape Cod and Massachusetts Bays as Northern Atlantic right whale critical habitat in June 1994 (59 FR 28793). NMFS has designated additional critical habitat in the southeastern U.S. Multispecies gear operates in the ocean at or near the bottom rather than near the surface. It is not known whether the bottom-trawl, or any other type of fishing gear, has an impact on the habitat of the Northern right whale (59 FR 28793). As discussed in the FY 2010 and FY 2011 sector EAs and further in Section 5.1, sectors would result in a negligible effect on physical habitat. Therefore, FY 2013 sector operations would not result in a significant impact on Northern right whale critical habitat. Further, mesh sizes used in the multispecies fishery do not significantly impact the Northern right whale’s planktonic food supply (59 FR 28793). Therefore, Northern right whale food sources in areas designated as critical habitat would not be adversely affected by sectors. For these reasons, Northern right whale critical habitat will not be considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges, but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare (NMFS 2009a).

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2011). In the North Atlantic region, blue whales are most frequently sighted from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program surveys of the mid- and North Atlantic areas of the outer continental shelf (Cetacean and Turtle Assessment Program 1982). Calving for the species occurs in low latitude waters outside of the area where the sectors would operate. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. There are no recent confirmed records of mortality or serious injury to blue whales in the IS Atlantic EEZ (Waring et al. 2011). The species is unlikely to occur in areas where the sectors would operate, and sector operations would not affect the availability of blue whale prey or areas where calving and nursing of young occurs. Therefore, the Preferred Alternatives would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do 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. 2013). Sperm whale distribution is typically concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the Mid-Atlantic Bight (Waring et al. 2013). Distribution extends further northward to areas north of

Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 2013). In contrast, the sectors would operate in continental shelf waters. The average depth over which sperm whale sightings occurred during the Cetacean and Turtle Assessment Program surveys was 5,879 ft. (1,792 m) (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 3,280 ft. (1,000 m) and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin et al. 2002). There were no observed fishery-related mortalities or serious injuries to sperm whales in US Atlantic commercial fisheries between 2006 and 2010 (Waring et al. 2013). Sperm whales are unlikely to occur in water depths where the sectors would operate, sector operations would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect sperm whales.

Although marine turtles and large whales could be potentially affected through interactions with fishing gear, NMFS has determined that the continued authorization of the multispecies fishery, and therefore the FY 2011 sectors, would not have any adverse effects on the availability of prey for these species. Sea turtles feed on a variety of plants and animals, depending on the species. However, none of the turtle species are known to feed upon groundfish. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The multispecies fishery will not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that will pass through multispecies fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish such as sand lance, herring and mackerel (Aguilar 2002, Clapham 2002). Multispecies fishing gear operates on or very near the bottom. Fish species caught in multispecies gear are species that live in benthic habitat (on or very near the bottom) such as flounders. As a result, this gear does not typically catch schooling fish such as herring and mackerel that occur within the water column. Therefore, the continued authorization of the multispecies fishery or the approval of the FY 2013 sector operations plans will not affect the availability of prey for foraging humpback or fin whales.

6.4.4 Interactions between Gear and Protected Resources

Marine Mammals

NMFS categorizes commercial fisheries based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each marine mammal stock. NMFS bases the system on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a marine mammal stock's PBR level. Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries. Tier 2 considers marine mammal mortality and serious injury caused by the individual fisheries. This EA uses Tier 2 classifications to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals (NMFS 2009b). Table 14 identifies the classifications used in the final List of Fisheries (for FY 2012 (76 FR 73912; November 29, 2011; NMFS 2011), which are broken down into Tier 2 Categories I, II, and III.

Table 14 – Descriptions of the Tier 2 Fishery Classification Categories (50 CFR 229.2)

Category	Category Description
Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's PBR level.
Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: a. Less than 50 percent of any marine mammal stock's PBR level, or b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serious injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

Interactions between gear and a given species occur when fishing gear overlaps both spatially and trophically with the species' niche. Spatial interactions are more "passive" and involve inadvertent interactions with fishing gear when the fishermen deploy gear in areas used by protected resources. Trophic interactions are more "active" and occur when protected species attempt to consume prey caught in fishing gear and become entangled in the process. Spatial and trophic interactions can occur with various types of fishing gear used by the multispecies fishery through the year. Many large and small cetaceans and sea turtles are more prevalent within the operations area during the spring and summer. However they are also relatively abundant during the fall and would have a higher potential for interaction with sector activities that occur during these seasons. Although harbor seals may be more likely to occur in the operations area between fall and spring, harbor and gray seals are year-round residents. Therefore, interactions could occur year-round. The uncommon occurrences of hooded and harp seals in the operations area are more likely to occur during the winter and spring, allowing for an increased potential for interactions during these seasons.

Although interactions between protected species and gear deployed by the Northeast Multispecies fishery would vary, interactions generally include:

- becoming caught on hooks (bottom longlines)
- entanglement in mesh (gillnets and trawls)
- entanglement in the float line (gillnets and trawls)
- entanglement in the groundline (traps/pots, gillnets, trawls, and bottom longlines)
- entanglement in anchor lines (gillnets and bottom longlines), or

- entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets, traps/pots, and bottom longlines).

NMFS assumes the potential for entanglements to occur is higher in areas where more gear is set and in areas with higher concentrations of protected species.

Table 15 lists the marine mammals known to have had interactions with gear used by the Northeast multispecies fishery. This gear includes sink gillnets, traps/pots, bottom trawls, and bottom longlines within the Northeast multispecies region, as excerpted from the List of Fisheries for FY 2012 ([76 FR 73912; November 29, 2011], also see Waring et al. 2013). Sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. There are no observed reports of interactions between groundfish bottom longline gear and marine mammals in FY 2009 through FY 2011. However, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

Table 15 - Marine Mammal Species and Stocks Incidentally Killed or Injured Based on Northeast Multispecies Fishing Areas and Gear Types (based on 2013 List of Fisheries)

Fishery Category	Fishery Type	Estimated Number of Vessels/Person	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category I	Mid-Atlantic gillnet	5,509	Bottlenose dolphin, Northern Migratory coastal [a] Bottlenose dolphin, Southern Migratory coastal [a] Bottlenose dolphin, Northern NC estuarine system [a] Bottlenose dolphin, Southern NC estuarine system [a] Bottlenose dolphin, WNA offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Humpback whale, Gulf of Maine Long-finned pilot whale, WNA Minke whale, Canadian east coast Risso's dolphin, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
	Northeast sink gillnet	4,375	Bottlenose dolphin, WNA, offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, GOM Long-finned Pilot whale, WNA Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA Short-finned Pilot whale, WNA White-sided dolphin, WNA
Category II	Mid-Atlantic bottom trawl	631	Bottlenose dolphin, WNA offshore Common dolphin, WNA [a] Gray seal, WNA Harbor seal, WNA Long-finned pilot whale, WNA [a] Risso's dolphin, WNA Short-finned pilot whale, WNA [a] White-sided dolphin, WNA
	Northeast bottom trawl	2,987	Bottlenose dolphin, WNA

			offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GOM/ Bay of Fundy Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Minke whale, Canadian East Coast Short-finned pilot whale, WNA White-sided dolphin, WNA [a]
	Atlantic mixed species trap/pot [c]	3,467	Fin whale, WNA Humpback whale, GOM
Category III	Northeast/Mid-Atlantic bottom longline/hook-and-line	>1,207	None documented in recent years

Notes:

[a] Fishery classified based on serious injuries and mortalities of this stock, which are greater than 50 percent (Category I) or greater than 1 percent and less than 50 percent (Category II) of the stock's PBR.

Table 16 shows trends in marine mammal and ESA listed species takes from FY 2009 to FY 2011 (fishing years as opposed to calendar years) as recorded in the ASM and observer program data. This data comes from trips that were potentially using sector ACE.

Table 16 - Marine Mammal and ESA listed Species Takes by Gear as Recorded in ASM and Observer Program Universe: Trips Potentially Using Sector ACE in FY 2009 - FY 2011 (Data as of: October 18, 2012)

Gear Name	Species Category	Common Name	Scientific Name	2009 Takes	2010 Takes	2011 Takes
GILL NET, DRIFT-SINK, FISH	pinniped	SEAL, HARBOR	PHOCA VITULINA CONCOLOR	2	0	0
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	PORPOISE, HARBOR	PHOCOENA PHOCOENA	18	31	10
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	PORPOISE/DOLPHIN, NK	PHOCOENIDAE/DELPHINIDAE	0	0	2
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	DOLPHIN, NK (MAMMAL)	DELPHINIDAE	0	0	1
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	DOLPHIN, WHITESIDED	LAGENORHYNCHUS ACUTUS	1	1	0
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	DOLPHIN,COMMON (OLD SADDLEBACK)	DELPHINUS DELPHIS (COMMON)	1	1	2
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	MARINE MAMMAL, NK	CETACEA/PINNIPEDIA	0	1	0
GILL NET, FIXED OR ANCHORED,SINK, OTHER	cetacean	WHALE, PILOT, NK	GLOBICEPHALA SP	0	1	0
GILL NET, FIXED OR ANCHORED,SINK, OTHER	pinniped	SEAL, HARBOR	PHOCA VITULINA CONCOLOR	27	4	30
GILL NET, FIXED OR ANCHORED,SINK, OTHER	pinniped	SEAL, NK	PHOCIDAE	9	9	0
GILL NET, FIXED OR ANCHORED,SINK, OTHER	pinniped	SEAL, GRAY	HALICHOERUS GRYPUS	52	41	53
GILL NET, FIXED OR ANCHORED,SINK, OTHER	pinniped	SEAL, HARP	PHOCA GROENLANDICA	2	1	0
GILL NET, FIXED OR ANCHORED,SINK, OTHER	Turtle	TURTLE, NK HARD-SHELL	CHELONIIDAE	1	0	1
TRAWL,OTTER,BOTTOM,FISH	Cetacean	DOLPHIN, WHITESIDED	LAGENORHYNCHUS ACUTUS	9	35	9
TRAWL,OTTER,BOTTOM,FISH	Cetacean	DOLPHIN, NK (MAMMAL)	DELPHINIDAE	0	0	5
TRAWL,OTTER,BOTTOM,FISH	Cetacean	PORPOISE, HARBOR	PHOCOENA PHOCOENA	0	1	4
TRAWL,OTTER,BOTTOM,FISH	Cetacean	WHALE, PILOT, NK	GLOBICEPHALA SP	3	6	2
TRAWL,OTTER,BOTTOM,FISH	Cetacean	DOLPHIN,COMMON (OLD SADDLEBACK)	DELPHINUS DELPHIS (COMMON)	3	6	4
TRAWL,OTTER,BOTTOM,FISH	Cetacean	DOLPHIN, RISSOS	GRAMPUS GRISEUS	1	0	0
TRAWL,OTTER,BOTTOM,FISH	Cetacean	WHALE, NK	CETACEA, WHALE	0	0	1

TRAWL,OTTER,BOTTOM,FISH	pinniped	SEAL, HARBOR	PHOCA VITULINA CONCOLOR	0	3	0
TRAWL,OTTER,BOTTOM,FISH	pinniped	SEAL, GRAY	HALICHOERUS GRYPUS	5	2	5
TRAWL,OTTER,BOTTOM,FISH	Turtle	TURTLE, LOGGERHEAD	CARETTA CARETTA	1	0	2
TRAWL,OTTER,BOTTOM,FISH	Turtle	TURTLE, LEATHERBACK	DERMOCHELYS CORIACEA	0	1	0
TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	cetacean	DOLPHIN,COMMON (OLD SADDLEBACK)	DELPHINUS DELPHIS (COMMON)	0	2	6
TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	cetacean	WHALE, PILOT, NK	GLOBICEPHALA SP	1	1	1
TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	pinniped	SEAL, GRAY	HALICHOERUS GRYPUS	0	0	1
TRAWL,OTTER,BOTTOM,RUHLE	cetacean	WHALE, PILOT, NK	GLOBICEPHALA SP	2	0	0
TRAWL,OTTER,BOTTOM,RUHLE	cetacean	DOLPHIN, WHITESIDED	LAGENORHYNCHUS ACUTUS	0	1	0
TRAWL,OTTER,BOTTOM,RUHLE	cetacean	DOLPHIN,COMMON (OLD SADDLEBACK)	DELPHINUS DELPHIS (COMMON)	1	0	0
TRAWL,OTTER,BOTTOM,RUHLE	pinniped	SEAL, GRAY	HALICHOERUS GRYPUS	0	0	1

Marine mammals are taken in gillnets, trawls, and trap/pot gear used in the Northeast Multispecies area. Documented marine mammal interactions in Northeast sink gillnet and Mid- Atlantic gillnet fisheries include harbor porpoise, white-sided dolphin, harbor seal, gray seal, harp seal, hooded seal, pilot whale, bottlenose dolphin (various stocks), Risso's dolphin, and common dolphin. Table 17 and Table 18 summarize the estimated mean annual mortality of small cetaceans and seals that are taken in the Northeast sink gillnet and Mid-Atlantic gillnet fisheries according to the most recent SAR for each particular species.

Documented marine mammal interactions with Northeast and Mid-Atlantic bottom trawl fisheries include minke whale, harbor porpoise, white-sided dolphin, harbor seal, gray seal, harp seal, pilot whale, and common dolphin. Table 19 and Table 20 provide the estimated mean annual mortality of small cetaceans and seals that are taken in the Northeast and Mid-Atlantic bottom trawl fisheries, based on the most recent SAR for each particular species. The data in these tables are based on takes observed by fishery observers as part of the Northeast Fisheries Observer Program (NEFOP).

Table 17 - Estimated Marine Mammals Mortalities in the Northeast Sink Gillnet Fishery

Species	**Years Observed**	**Mean Annual Mortality (CV)**	**Total PBR**
Harbor porpoise	06-10	511 (0.17)	706
Atlantic white-sided dolphin	06-10	38 (0.46)	304
Common dolphin (short-beaked)	06-10	30 (0.42)	529
Risso's dolphin	06-10	0	95
Western North Atlantic Offshore bottlenose dolphin	02-06	Unknown+	566
Harbor seal	06-10	280 (0.17)	Undetermined
Gray seal	06-10	794 (0.13)	Undetermined
Harp seal	06-10	218 (0.20)	Unknown
Hooded seal	01-05	25 (0.82)	Unknown

Source: Waring et al. (2009, 2011, 2013)

+While there have been documented interactions between the Western North Atlantic Offshore bottlenose dolphin stock and the Northeast sink gillnet fishery during the five year time period, estimates of bycatch mortality in the fishery have not been generated.

Table 18 - Estimated Marine Mammal Mortalities in the Mid-Atlantic Gillnet Fishery

Species	Years Observed	Mean Annual Mortality (CV)	Total PBR
Harbor porpoise	06-10	275 (0.29)	706
Common dolphin (short-beaked)	06-10	8.4 (0.55)	529
Risso's dolphin	06-10	6.4 (0.73)	95
Bottlenose dolphin	06-08		
Western North Atlantic Northern Migratory Coastal stock		5.27 (0.19) min; 6.02 (0.19) max	71
Western North Atlantic Southern Migratory Coastal stock	06-08	5.71 (0/31 min; 41.91 (0.14) max	96
Northern North Carolina Estuarine System stock	06-08	2.39 (0.25) min; 18.99 (0.11) max 3.47 (0.30) min; 19.79 (0.11) max	7.9
Southern North Carolina Estuarine System stock	06-08	0.61 (0.30) min; 0.92 (0.21) max 0.61 (0.22) min; 1.22 (0.18 max	16
Western North Atlantic Offshore stock	02-06	Unknown+	566
Harbor seal	06-10	50 (0.34)	Undetermined
Harp seal	06-10	63 (0.46)	Unknown

Source: Waring et al. (2009, 2011, 2012, 2013)
+ While there have been documented interactions between the Western North Atlantic Offshore bottlenose dolphin stock and the Mid-Atlantic gillnet fishery during the five year time period, estimates of bycatch mortality in the fishery have not been generated.

Table 19 - Estimated Marine Mammal Mortalities in the Northeast Bottom Trawl Fishery

Species	Years Observed	Mean Annual Mortality (CV)	Total PBR
Minke whale	06-10	2.6 (0.46)	162
Harbor porpoise	06-10	4.5 (0.30)	706
Atlantic white-sided dolphin	06-10	12 (0.45)	304
Common dolphin (short-beaked)	06-10	20 (0.13)	529
Pilot whales*	05-09	12 (0.14)	93 (long-finned); 172 (short-finned)
Harbor seal	06-10	0.8 (4 animals/5 years)	Undetermined
Gray seal	06-10	6 (30 animals/5 years)	Undetermined
Harp seal	06-08	0	Unknown

Source: Waring et al. (2012, 2013)

*Total fishery-related serious injuries and mortalities to pilot whales (*Globicephala* sp.) cannot be differentiated to species due to uncertainty in species identification by fishery observers (Waring et al. 2012). However, separate PBRs have been calculated for long-finned and short-finned pilot whales.

Table 20 - Estimated Marine Mammal Mortalities in the Mid-Atlantic Bottom Trawl Fishery

Species	Years Observed	Mean Annual Mortality (CV)	Total PBR
Atlantic white-sided dolphin	06-10	20 (0.09)	304
Common dolphin (short-beaked)	06-10	103 (0.13)	529
Pilot whales*	05-09	30 (0.16)	93 (long-finned); 172 (short-finned)

Source: Waring et al. (2012, 2013)

*Total fishery-related serious injuries and mortalities to pilot whales (*Globicephala* sp.) cannot be differentiated to species due to uncertainty in species identification by fishery observers (Waring et al. 2012). However, separate PBRs have been calculated for long-finned and short-finned pilot whales.

Takes of large whales are typically not documented within observer records as large whales are typically entangled in fixed fishing gear and the chances of observing an interaction are small. Although large whales can become anchored in gear, they more often swim off with portions of the fishing gear; therefore, documentation of their incidental take is based primarily on the observation of gear or markings on whale carcasses, or on whales entangled and observed at-sea. Even if a whale is anchored in fishing gear, it is extremely difficult to make any inferences about the nature of the entanglement event and initial interaction between the whale and the gear. Frequently, it is difficult to attribute a specific gear type to an entangled animal based on observed scars or portions of gear remaining attached to whales or their carcasses; however, gillnet gear has been identified on entangled North Atlantic right whales, humpback whales, fin whales, and minke whales. Minke whales have been observed to be taken in the Northeast bottom trawl fishery by fishery observers. The annual estimated mortality and serious injury to minke whales from this fishery was 2.6 (CV = 0.46) between 2006 and 2010 (Waring et al. 2013). At this time, there is no evidence suggesting that other large whale species interact with trawl gear fisheries.

A number of marine mammal management plans are in place along the U.S. east coast to reduce serious injuries and deaths of marine mammals due to interactions with commercial fishing gear. Multispecies fishing vessels are required to adhere to measures in the Atlantic Large Whale Take Reduction Plan (ALWTRP), which manages from Maine through Florida, to minimize potential impacts to certain cetaceans. The ALWTRP was developed to address entanglement risk to right, humpback, and fin whales, and to acknowledge benefits to minke whales in specific Category I or II commercial fishing efforts that utilize traps/pots and gillnets. This includes the Northeast sink gillnet and Mid-Atlantic gillnet fisheries. The ALWTRP calls for the use of gear markings, area restrictions, weak links, and sinking groundline. Fishing vessels would be required to comply with the ALWTRP in all areas where gillnets were used.

Fishing vessels would also be required to comply, where applicable, with the seasonal gillnet requirements of the Bottlenose Dolphin Take Reduction Plan (BDTRP), which manages coastal waters from New Jersey through Florida, and Harbor Porpoise Take Reduction Plan (HPTRP), which manages coastal and offshore waters from Maine through North Carolina. The BDTRP spatially and temporally restricts night time use of gillnets and requires net tending in the Mid- Atlantic gillnet region. The HPTRP aims to reduce interactions between harbor porpoises and gillnets in the Gulf of Maine, southern New England, and Mid-Atlantic regions. In New England waters, the HPTRP implements seasonal area closures and the seasonal use of pingers (acoustic devices that emit a sound) to deter harbor porpoises from approaching the nets. In Mid-Atlantic waters, the HPTRP implements seasonal area closures and the seasonal use of gear modifications for large mesh (7-18 in) and small mesh (<5 to >7 in) gillnets to reduce harbor porpoise bycatch.

An Atlantic Trawl Gear Take Reduction Team was formed in 2006 to address the bycatch of white-sided and common dolphins and pilot whales in Northeast and Mid-Atlantic trawl gear fisheries. While a take reduction plan with regulatory measures was not implemented (bycatch levels were not exceeding allowable thresholds under the MMPA), a take reduction strategy was developed that recommends voluntary measures to be used to reduce the chances for interactions between trawl gear and these marine mammal species. The two voluntary measures that were recommended are: 1) reducing the number of turns made by the fishing vessel and tow times while fishing at night; and 2) increasing radio communications between vessels about the presence and/or incidental capture of a marine mammal to alert other fishermen of the potential for additional interactions in the area.

Sea Turtles

Sea turtles have been caught and injured or killed in multiple types of fishing gear, including gillnets, trawls, and hook and line gear. However, impact due to inadvertent interaction with trawl gear is almost twice as likely to occur when compared with other gear types (NMFS 2009d). Interaction with trawl gear is more detrimental to sea turtles as they can be caught within the trawl itself and will drown after extended periods underwater. A study conducted in the Mid- Atlantic region showed that bottom trawling accounts for an average annual take of 616 loggerhead sea turtles, although Kemp's ridleys and leatherbacks were also caught during the study period (Murray 2006). Impacts to sea turtles would likely still occur under the Proposed Action even though sea turtles generally occur in more temperate waters than those in the Northeast Multispecies area.

Atlantic Sturgeon

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

The NEFSC prepared an estimate of the number of encounters of Atlantic sturgeon in fisheries authorized by Northeast FMPs. The analysis estimates that from 2006 through 2010, there were averages of 1,239 and 1,342 encounters per year in observed gillnet and trawl fisheries, respectively, with an average of 2,581 encounters combined annually. Mortality rates in gillnet gear were approximately 20%. Mortality rates in otter trawl gear observed are generally lower, at approximately 5%. The highest incidence of sturgeon bycatch in sink gillnets is associated with depths of <40 meters, larger mesh sizes, and the months April-May. Sturgeon bycatch in ocean fisheries is actually documented in all four seasons with higher numbers of interactions in November and December in addition to April and May. Mortality is also correlated to higher water temperatures, the use of tie-downs, and increased soak times (>24 hours).

Most observed sturgeon deaths occur in sink gillnet fisheries. For otter trawl fisheries, Atlantic sturgeon bycatch incidence is highest in depths <30 meters and in the month of June.

The NE multispecies fishery is prosecuted with both bottom otter trawl and sink gillnet gear. These data support the conclusion from the earlier bycatch estimates that the NE multispecies fishery may interact with Atlantic sturgeon. However, the more recent, larger population estimate derived from NEAMAP data (Kocik et al. 2013) suggests that the level of interactions with the NE multispecies fishery is not likely to have a significant adverse impact on the overall Atlantic sturgeon population, or any of the DPSs. On February 6, 2012, NMFS issued two final rules (77 FR 5880-5912; 77 FR 5914-5982) listing five DPS's of Atlantic sturgeon as threatened or endangered. Four DPSs (New York Bight, Chesapeake Bay, Carolina and South Atlantic) are listed as endangered and one DPS (Gulf of Maine) is listed as threatened. The effective date of the listing is April 6, 2012. Formal consultation under Section 7 of the ESA was reinitiated NE multispecies fishery to analyze potential impacts to Atlantic sturgeon. The resulting December 2013 Biological Opinion (BO) concluded that the actions considered would not jeopardize the continued existence of any listed species, including all five DPSs of Atlantic sturgeon.

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 21 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 21 - 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 19th 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.[5] 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 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.

[5] 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.

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 22). 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 22 - 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 23). 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 23 - 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[6] and total days absent on groundfish trips declined by 48% and 27%, respectively (Table 24).[7] 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 24). 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

[6] "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.
[7] The data is taken from different source materials (VMS, etc.) than other data in this document, and thus, may be slightly different than.

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 24 - 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 25, Table 26). 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 – 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 25 – 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 26 - 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 25, Table 26). 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 100 communities that are homeport to one or more Northeast groundfish fishing vessels. 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 (NEFSC 2013b).

This action contains several alternatives that are specific to Gulf of Maine cod, plaice, white hake and the Georges Bank stocks (cod, haddock, yellowtail flounder). To help describe which port communities could be most affected by the stock-specific alternatives, Table 28 identifies the landings by homeport for FY2012, using the primary ports identified in Table 27. Gulf of Maine cod, plaice, and white hake are important to homeports throughout the Northeast, where as the Georges Bank stocks are important to the larger port communities, such as Portland, Boston, Gloucester, and New Bedford.

Table 27 - 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 28 - FY2012 landings (lbs.) of selected groundfish stocks by homeports

State	Port	GOM Cod	GB Cod East	GB Haddock East	GB Yellowtail Flounder	Plaice	White Hake
ME	Portland	172,610	6,126	126,510	254	574,938	1,290,823
	Other	441,965	0	0	0	256,778	766,516
NH	Portsmouth	170,360	c	c	0	6,098	129,001
	Other	451,550	0	0	0	27,928	84,527
MA	Boston	692,359	15,471	161,870	30,126	921,301	1,269,153
	Chatham/Harwichport	c	0	0	c	8,808	74,672
	Gloucester	1,646,086	5,357	54,581	3,073	305,527	973,713
	New Bedford/Fairhaven	105,227	45,504	178,859	284,578	571,794	448,681
	Other	744,294	c	85,902	c	179,792	158,355
RI	Point Judith	c	306	728	25,915	35,649	15,856
	Other	c	c	c	35,139	18,377	6,716
NY	Eastern Long Island	0	c	c	c	2,761	2,193
	Other	c	0	c	0	1,758	18,902
**Other		105,023	391	25,101	11,194	102,161	119,263
Total		***4,529,474**	***73,155**	***633,551**	***390,279**	**3,013,670**	**5,358,371**

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 29). 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 30). 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 29 - 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 30 - 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.[8] 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 31). 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 31 - 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**

A crew day[9] 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 31). 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.

[8] Crew positions are measured by summing the average crew size of all active vessels on all trips.
[9] 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.

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.

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 32 to Table 34 compare FY2012 catches to ACLs. As shown in Table 33, catches exceed ACLs for only two stocks: GOM/GB windowpane flounder and SNE/MA windowpane flounder. ACLs for these two stocks were also exceeded in FY2010 and FY2011. AMs for those stocks were modified in FW47. Table 34 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 32 - FY2012 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 Groundfish	Groundfish Fishery	Sector	Common Pool	Recreational*	Midwater Trawl Herring Fishery**	Scallop Fishery	State Water	Other
	A to G	A+B+C	A	B	C	D	E	F	G
GB Cod	1,724.1	1,621.7	1,593.0	28.656				21.5	80.9
GOM Cod	3,903.8	3,854.9	2,181.1	29.9	1,644.0			44.6	4.3
GB Haddock	1,525.5	1,197.6	1,197.1	0.5		288.6		14.2	25.1
GOM Haddock	530.0	526.7	245.1	0.9	280.7	0.1		1.7	1.6
GB Yellowtail Flounder	384.9	215.5	215.2	0.3			164.0	0.0	5.4
SNE/MA Yellowtail Flounder	593.5	463.0	425.6	37.4			54.0	12.0	64.6
CC/GOM Yellowtail Flounder	1,012.3	957.6	954.3	3.2				33.7	20.9
Plaice	1,642.8	1,604.7	1,601.4	3.3				15.3	22.8
Witch Flounder	1,174.0	983.3	981.0	2.3				28.2	162.5
GB Winter Flounder	2,057.6	1,931.7	1,930.9	0.8				0.0	125.9
GOM Winter Flounder	322.8	260.0	258.0	2.0				60.2	2.6
SNE/MA Winter Flounder	315.9	106.0	104.8	1.1				58.9	151.0
Redfish	4,445.4	4,429.0	4,423.4	5.6				13.4	3.1
White Hake	2,485.4	2,470.6	2,446.8	23.8				2.8	12.0
Pollock	8,092.4	6,462.5	6,394.7	67.8				532.3	1,097.6
Northern Windowpane	208.9	129.6	129.5	0.1				2.3	77.0
Southern Windowpane	520.9	106.5	95.9	10.6				34.4	380.0
Ocean Pout	53.2	39.1	35.4	3.6				1.2	13.0
Halibut	75.7	60.7	57.4	3.3				13.3	1.7
Wolffish	32.4	30.2	30.0	0.1				1.0	1.2

Notes:
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 33 – FY2012 Catches as Percent of ACL

Stock	Components with ACLs and sub-ACLs (with accountability measures (AMs))							sub-components: No AMs	
	Total Groundfish*	Groundfish Fishery*	Sector*	Common Pool	Recreational**	Midwater Trawl Herring Fishery	Scallop Fishery	State Water	Other
GB Cod	26.9	26.1	26.0	35.4				42.2	39.7
GOM Cod	58.3	60.4	47.4	37.3	74.2			17.6	6.9
GB Haddock	1.1	0.0	-	0.6		100.9		4.6	2.0
GOM Haddock	47.3	49.3	25.9	18.6	108.4	0.6		11.1	7.1
GB Yellowtail Flounder	70.3	58.5	59.1	6.1			104.5	n/a	23.9
SNE Yellowtail Flounder	59.3	55.8	63.7	24.4			42.5	120.2	161.5
CC/GOM YTF	83.5	82.9	84.7	13.0				96.4	91.0
Plaice	38.8	39.7	40.3	6.1				42.5	15.7
Witch Flounder	67.4	59.6	60.3	10.5				57.5	246.2
GB Winter Flounder	53.4	52.6	52.9	3.9				n/a	67.0
GOM Winter Flounder	28.1	32.0	32.9	7.8				22.1	4.9
SNE/MA Winter Flounder	52.4	35.0	n/a	n/a				33.7	120.8
Redfish	42.1	44.2	44.3	16.6				14.5	0.8
White Hake	67.2	70.5	70.3	91.6				3.8	11.0
Pollock	45.5	40.3	40.0	82.7				70.6	80.1
Northern Windowpane	128.2	100.5	n/a	n/a				115.9	233.2
Southern Windowpane	136.7	147.9	n/a	n/a				88.3	140.7
Ocean Pout	22.2	18.3	n/a	n/a				38.5	56.3
Halibut	91.2	168.7	n/a	n/a				30.8	42.2
Wolffish	42.0	41.3	n/a	n/a				99.2	40.6

Notes:
Data as of Nov. 5, 2013, Northeast Regional Office.
* With the exception of GOM cod the percent of the FY 2012 catch limits caught does not include any FY 2011 carryover caught by sectors in FY 2012. FY 2011 carryover caught is not applied to the FY 2012 ACL. For 2012 year-end accounting, all sector carryover for GOM cod should be counted against the groundfish sub-ACL. As with all other stocks, do not apply sector carryover for GOM cod against a sector's ACE or the sector sub-ACL for in-season monitoring.
** To determine if recreational AM is triggered, the Regional Administrator must use the 3-year average catch compared to the 3-year average of the recreational sub-ACL for a stock.

Table 34 - FY2012 Catches by Non-Groundfish FMPs (Metric Tons, Live Weight)

Stock	Total	Scallop[1]	Fluke	Hagfish	Herring	Lobster/ Crab	Menhaden	Monkfish	Red Crab	Research
GB Cod	90.2	5.7	0.6	0.0	0.3	0.7	0.1	0.1	0.0	12.3
GOM Cod	28.8	-	0.6	0.0	2.9	0.1	0.0	0.0	-	8.7
GB Haddock	305.8	2.4	8.2	-	14.4**	2.3	-	0.1	-	18.1
GOM Haddock	8.4	-	0.0	0.0	2.6**	0.1	-	-	-	0.2
GB Yellowtail Flounder	43.2	-**	0.1	0.0	1.0	0.0	-	0.0	0.0	-
SNE Yellowtail Flounder	26.7	-**	8.5	-	0.1	0.0	0.0	0.1	0.0	3.4
CC/GOM Yellowtail Flounder	8.1	2.9	0.1	0.0	0.5	0.0	0.0	0.0	-	2.5
Plaice	12.6	0.0	1.3	0.0	1.4	0.5	0.3	0.0	0.0	1.5
Witch Flounder	166.4	18.0	19.5	0.0	7.2	1.5	0.4	0.2	0.0	1.1
GB Winter Flounder	59.4	38.4	0.3	-	0.4	0.0	-	-	-	-
GOM Winter Flounder	13.2	2.0	0.0	0.0	0.2	0.0	-	-	-	0.2
SNE Winter Flounder	164.9	60.3	16.4	0.0	2.6	0.6	0.0	0.2	0.0	3.5
Redfish	10.2	0.0	3.1	0.0	0.2	0.1	0.0	0.0	0.0	0.1
White Hake	4.4	2.0	0.4	0.0	0.0	0.1	0.0	0.6	0.0	0.0
Pollock	757.6	-	0.8	0.0	0.5	0.2	0.1	0.0	0.0	0.6
Northern Windowpane	34.8	33.0	0.0	0.0	0.2	0.0	-	0.0	0.0	0.0
Southern Windowpane	376.0	135.3	75.9	-	1.6	0.6	0.1	0.6	0.0	0.0
Ocean Pout	29.5	6.4	6.5	0.0	0.4	0.1	0.0	0.0	0.0	0.0
Halibut	2.5	0.8	0.1	-	0.1	0.4	-	0.0	-	0.0
Wolffish	0.1	-	0.0	-	-	-	-	-	-	-

Notes:
[1]Based on scallop fishing year March, 2011 through February, 2012
*Estimates not applicable. Recreational amounts are not attributed to the ACL consistent with the assessments for these stocks used to set FY2011 quotas.

Table 34– Cont.

Stock	Scup	Shrimp	Squid	Squid/ Whiting	Surf Clam	Tilefish	Whelk/Conch	Whiting	Unknown	Rec.
GB Cod	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	15.2	54.6
GOM Cod	2.5	0.7	0.4	3.1	0.0	-	0.0	2.6	7.3	-**
GB Haddock	5.5	0.1	98.8	52.0	-	-	-	0.9	102.9	N/A*
GOM Haddock	-	0.5	0.0	0.8	-	-	0.0	1.9	2.4	-**
GB Yellowtail Flounder	0.2	0.0	0.2	40.7	-	-	0.0	-	1.0	
SNE Yellowtail Flounder	4.5	0.0	1.2	1.2	0.0	0.0	0.0	0.0	7.7	
CC/GOM Yellowtail Flounder	0.3	0.1	0.0	0.4	0.0	-	0.0	0.3	0.9	
Plaice	0.8	0.0	2.1	1.3	0.0	0.0	0.0	0.0	3.2	
Witch Flounder	13.0	0.2	35.3	20.7	0.0	0.0	0.1	0.8	48.3	
GB Winter Flounder	1.2	0.0	0.2	16.7	-	-	-	0.1	2.2	
GOM Winter Flounder	-	0.0	0.0	0.1	-	-	0.0	0.2	0.2	10.3
SNE Winter Flounder	8.3	0.0	19.5	6.8	0.0	0.0	0.0	0.1	34.9	11.7
Redfish	2.1	0.0	0.9	0.8	0.0	0.0	0.0	0.0	2.9	
White Hake	0.4	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.6	
Pollock	0.5	0.0	0.1	0.1	0.0	0.0	0.0	0.0	6.1	748.5
Northern Windowpane	0.0	0.0	0.0	1.4	0.0	-	0.0	0.1	0.1	
Southern Windowpane	48.7	0.0	17.8	14.9	0.0	0.0	0.0	0.1	80.5	
Ocean Pout	4.4	0.0	2.7	2.1	0.0	0.0	0.0	0.1	6.9	
Halibut	0.1	0.0	0.3	0.2	-	-	-	0.0	0.5	
Wolffish	-	-	-	-	-	-	-	-	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 35). 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 36). 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 35 - 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 36 - 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 FY2012 (Table 32). 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 37). 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 38). The primary ports for this activity over the last 4 years (FY2009-2012) are Gloucester, Portland, and New Bedford (Table 39)

Table 37 - 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 38 - 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 39 - 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 40). 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 40 - 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 41). 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 41 - 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 42 - 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.

6.5.10 Atlantic Sea Scallop Fishery

Framework 51 includes an alternative that would prohibit the possession of yellowtail flounder by the limited access scallop fishery. This section provides background information in terms of landings, revenues, permits, vessels and various ports and coastal communities in the Northeast sea scallop fishery. See Appendix I of Framework 24 to the Scallop FMP for more information. Unless otherwise indicated, all the tables included are sourced from that document.

The Scallop FMP was implemented in 1982 and limited entry followed in 1994 (Amendment 4). In the FY2002-2011, the landings from the northeast sea scallop fishery stayed above 50M pounds, surpassing the levels observed historically (Figure 6). The recovery of the scallop resource and consequent increase in landings and revenues was striking given that average scallop landings per year were below 16M pounds during the 1994-1998 fishing years, less than one-third of the present level of landings.

The limited access scallop fishery consists of 347 vessels. It is primarily full-time, with 250 full-time (FT) dredge, 52 FT small dredge vessels and 11 FT net boats (Table 43).

Table 43 - Scallop permits by unique right-id and category by application year

Permit category	2009-2012
Full-time	250
Full-time small dredge	52
Full-time net boat	11
Total full-time	**313**
Part-time	2
Part-time small dredge	32
Part-time trawl	0
Total part-time	**34**
Occasional	0
Total Limited access	**347**

Since 2001, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices. Amendment 11 implemented a limited entry program for the general category fishery reducing the number of general category permits after 2007. In 2012, there were 278 LAGC IFQ permits, 96 NGOM and 279 incidental catch permits in the fishery totaling 653 permits including those LA vessels that also have a limited access general category permit (Table 44). Although not all vessels with general category permits were active in the years preceding 2008, there is no question that the number of vessels (and owners) that hold a limited access general category permit under the Amendment 11 regulations are less than the number of general category vessels that were active prior to 2008 (Table 11 and Table 12, Appx. I, FW 24).

Table 44 - LAGC permits, 2009-2012

Permit Category	Application Year	LA and LAGC permit	LAGC permit only	Grand Total
IFQ	2009	41	303	344
	2010	40	293	333
	2011	41	247	288
	2012	41	237	278
NGOM	2009	28	99	127
	2010	28	94	122
	2011	27	76	103
	2012	27	69	96
Incidental	2009	116	185	301
	2010	113	172	285
	2011	114	165	279
	2012	117	162	279
Grand Total		**733**	**2102**	**2835**

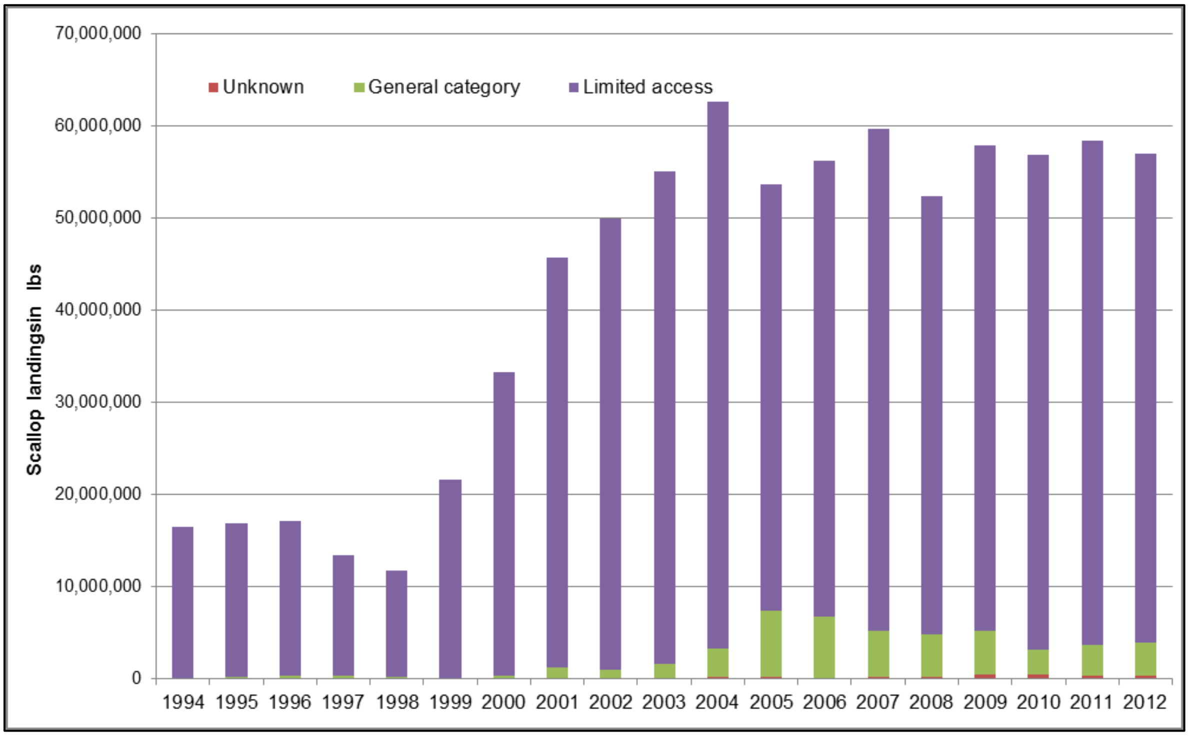
Notes:
May include duplicate records for replaced vessels with different permit numbers.

Total fleet revenues more than quadrupled, from about $120M in 1994 to almost $516M in 2011 (in inflation-adjusted 2012 dollars) (Figure 6). Scallop ex-vessel prices increased after 2001 as the composition of landings changed to larger scallops that in general command a higher price than smaller scallops. However, the rise in prices was not the main factor that led to the increase in revenue in the recent years compared to 1994-1998. The increase in total fleet revenue was mainly due to the increase in scallop landings and the increase in the number of active limited access vessels during the same period.

There has been a steady decline in the total DAS used by the limited access scallop vessels from FY1994 to FY2011 as a result of the effort-reduction measures since Amendment 4 (1994) (Figure 7). The impact of the decline in effort below 30,000 DAS since 2005 (with the exception of 2007) on scallop revenue per vessel was small, however, due to the increase in LPUE from about 1,600 lbs. per DAS in 2007 to over 2,300 pounds per day-at-sea in 2011.

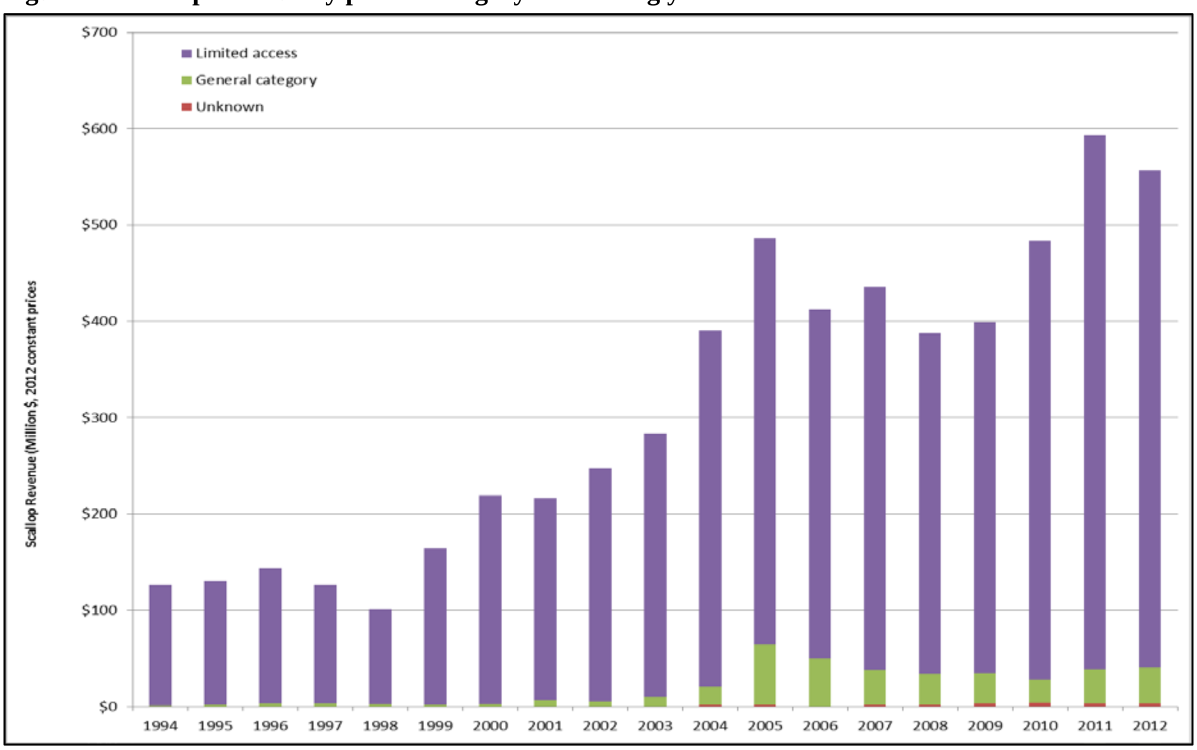
The scallop fishery is facing a decline in 2013. Recruitment has been below average for several years on Georges Bank and overall biomass is lower than previous years. Most of the scallop access areas have lower biomass than years past, and several areas in the Mid-Atlantic will be closed in 2013 to protect smaller scallops for future access. Total catch in 2013 will be about 30% less than catch levels in 2012 and 2011. Catch is expected to increase again over 22,000 mt (about 50M lbs.) starting in 2016, if the high levels of recruitment in the Mid-Atlantic grow as projected (Figure 8).

Figure 6 – Scallop landings by permit category and fishing years 1994 – 2012



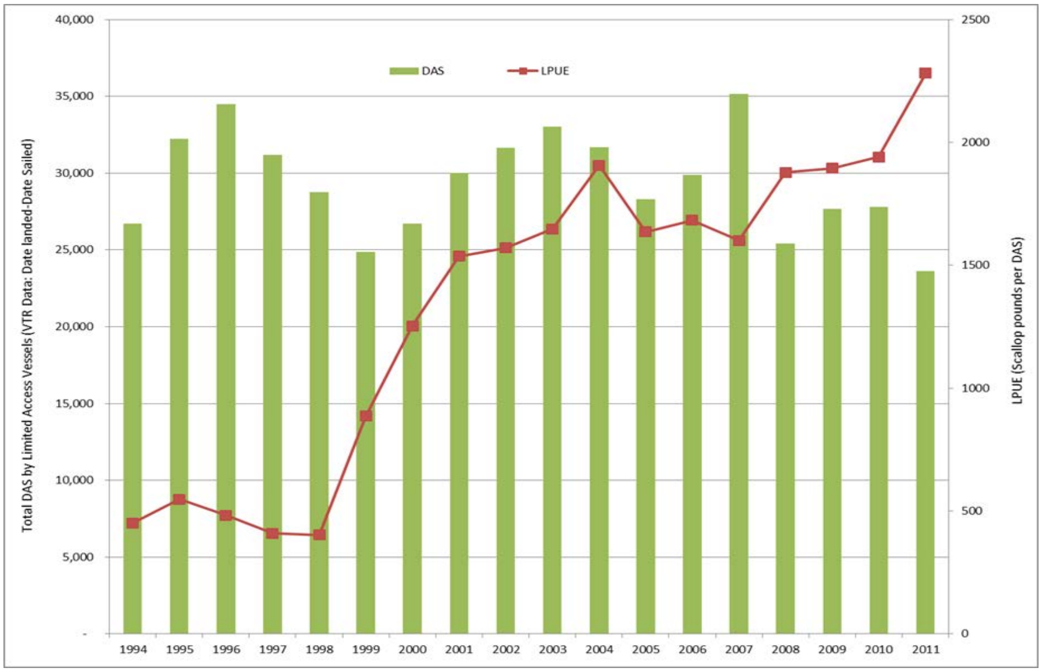
Source: Dealer data.

Figure 7 – Scallop revenue by permit category and fishing year



Note: Data in Million$, 2012 constant prices. Source: dealer data.

Figure 8 – Total DAS used by all limited access vessels and LPUE



Note: date landed – date sailed from VTR data

Most limited access category effort is from vessels using scallop dredges, including small dredges. The number of vessels using scallop trawl gear has decreased continuously and has been at 11 full-time trawl vessels since 2006 (Section 1.1.6, Appx. I, FW 24). Furthermore, according to the 2009-2012 VTR data, the majority of these vessels (10 out of 11 in 2010) landed scallops using dredge gear even though they had a trawl permit. Most general category effort is, and has been, from vessels using scallop dredge and other trawl gear. The percentages of scallop landings show that landings made with a scallop dredge in 2012 continue to be the highest compared to other general category gear types (Table 18 and Table 22, A Appx. I, FW 24).

Both full-time and part-time limited access vessels had a high dependence on scallops as a source of their income. Full-time limited access vessels had a high dependence on scallops as a source of their income and the majority of the full-time vessels (94%) derived more than 90% of their revenue from the scallop fishery in 2011 (Table 37, Appx. I, FW 24). Comparatively, part-time limited access vessels were less dependent on the scallop fishery in 2011, with only 37% of part-time vessels earning more than 90% of their revenue from scallops (Table 37, ibid).

General category permit holders (IFQ and NGOM) are less dependent on scallops compared to vessels with limited access permits. In 2011, 43% of IFQ permitted vessels earned greater than 50% of their revenue from scallops. Among active NGOM permitted vessels (that did not also have a limited access permit), 88% had no landings with scallops in 2011. Scallops still comprise the largest proportion of the revenue for IFQ general category vessels, accounting for 38.6% of these vessels revenue. Scallops still comprise the largest proportion of the revenue for IFQ general category vessels, accounting for 38.6% of these vessels revenue (Table 39 Appx I, FW 24). For NGOM vessels (that did not also have a limited access permit) scallop landings accounted for less than 1% of revenue in 2011 (ibid).

The number of crew positions, measured by summing the average crew size of all active limited access vessels on all trips that included scallops, has increased slightly from 2,172 positions in 2007 to 2,262 positions in 2011 (a 4% increase) (Table 47, Appx. I, FW 24). Broken out by home port state, the number of crew positions has stayed relatively constant during the past five years. Limited access vessels with a home port in Massachusetts and New Jersey experienced the largest percentage increase (5%: 969 to 1015 crew positions in MA and 15%: 490 to 564 crew positions in NJ). However, total crew effort in the limited access fishery, measured by crew days, declined from 207,088 to 160,355 (23%, Table 50, Appx I, FW 24) from 2007 to 2011. The number of crew days on general category vessels followed a similar pattern as the general category crew positions and trips, with large declines in 2008 and 2010, but then an increase in days in 2011(Table 52, ibid.).

The landed value of scallops by port landing fluctuated from 1994 through 2011 for many ports. In 2011 New Bedford accounted for 53% of all scallop landings and it continues to be the number one port for scallop landings. Included in the top five scallop ports are: Cape May, NJ; Newport News, VA; Barnegat Light/Long Beach NJ; and Seaford, VA. It is also fair to describe the fishing activities in these ports as highly reliant on the ex-vessel revenue generated from scallop landings as scallop landings represent greater than 75% of all ex-vessel revenue for each of the ports (Table 59, Appx. I, FW 24). There are also a number of ports with a comparatively small amount of ex-vessel revenue from scallops but where that scallop revenue represents a vast majority of the revenue from landings of all species (Table 60, ibid.). In 2011, in the ports of Newport News, VA and Seaford, VA; revenue from scallop landings accounted for 89.0% and 99.9% of all ex-vessel revenue respectively (Table 60, ibid.).

In terms of home state, the vessels from MA landed over 45% of scallops in 2010 and 2011 fishing years, followed by NJ with about 24.5% of all scallops landed by vessels homeported in this state (Appx. I, FW 24). Scallops also comprise a significant proportion of revenue (and landings) from all species with over 90% of total revenue in VA, over 75% of total revenue in NC, over 60% of total revenue in MA and over 68% of total revenue in NJ (ibid.).

As in previous years, the largest numbers of permitted limited access scallop vessels have home ports of New Bedford, MA and Cape May, NJ, which represent 39% and 21% of all limited access vessels, respectively (Table 62, Appx. I, FW 24). New Bedford also has the greatest number of general category scallop vessels, but while limited access vessels are mostly concentrated in the ports of New Bedford and Cape May, general category vessels are more evenly distributed throughout coastal New England. In addition to New Bedford, Point Judith, RI, Gloucester, MA, Boston, MA, Cape May, NJ and Barnegat Light, NJ, are all the homeport of at least 20 vessels with general category scallop permits (Table 63, ibid).

Retention of yellowtail flounder in the Limited Access Scallop Fishery

The minimum legal size for landing yellowtail flounder is 12 inches (30.5cm). Limited access scallop vessels have been required to retain legal sized yellowtail flounder since Groundfish Framework Adjustment 44, about May 2010. In the past, limited access vessels were restricted to a total possession limit of 300 lb per trip for all groundfish species combined. The last scallop assessment evaluated the full retention length of yellowtail flounder in scallop dredge gear, which was found to be 30-35cm. Therefore, yellowtail flounder less than 30cm are not fully retained in the dredge gear.

Analyses were conducted in order to:

1) summarize observer data on scallop trips since full retention of legal size yellowtail flounder has been required (2011-2013) to get a better idea of the size distribution of yellowtail bycatch and reason for discard in recent years;
2) summarize dealer data for scallop dredge gear landings of yellowtail flounder to get a better sense of the total level of yellowtail flounder landings and potential impacts on the scallop fishery if this framework (FW51) prohibits possession of yellowtail flounder.

Disposition of yellowtail flounder catch from observed hauls (2011-2013)
In general, most yellowtail flounder is discarded on observed hauls in the scallop fishery. Even fish that are required to be retained (i.e., yellowtail flounder larger than 30.5 cm) are discarded for a variety of reasons (Figure 9). The distribution of yellowtail flounder catch on observed hauls suggests that smaller yellowtail flounder are not retained in the dredge gear. Including all sizes observed, over 130,000 yellowtail flounder were measured on observed hauls in the scallop fishery between 2011 and August 2013 (Table 45). Over 75% of those measured fish were discarded, and about 23% were kept.

Since the majority of these fish were legal size and if observer data is reflective of fleet behavior then it can be inferred that the majority of the scallop fishery has not been landing legal sized yellowtail flounder. Therefore, the potential benefits of the current requirement to land legal sized yellowtail flounder, in terms of reducing discards and improving estimates, has probably been lower than expected based on the relatively low level of compliance suggested by these data.

Figure 9 - YT length data from one haul per watch on all observed scallop trips

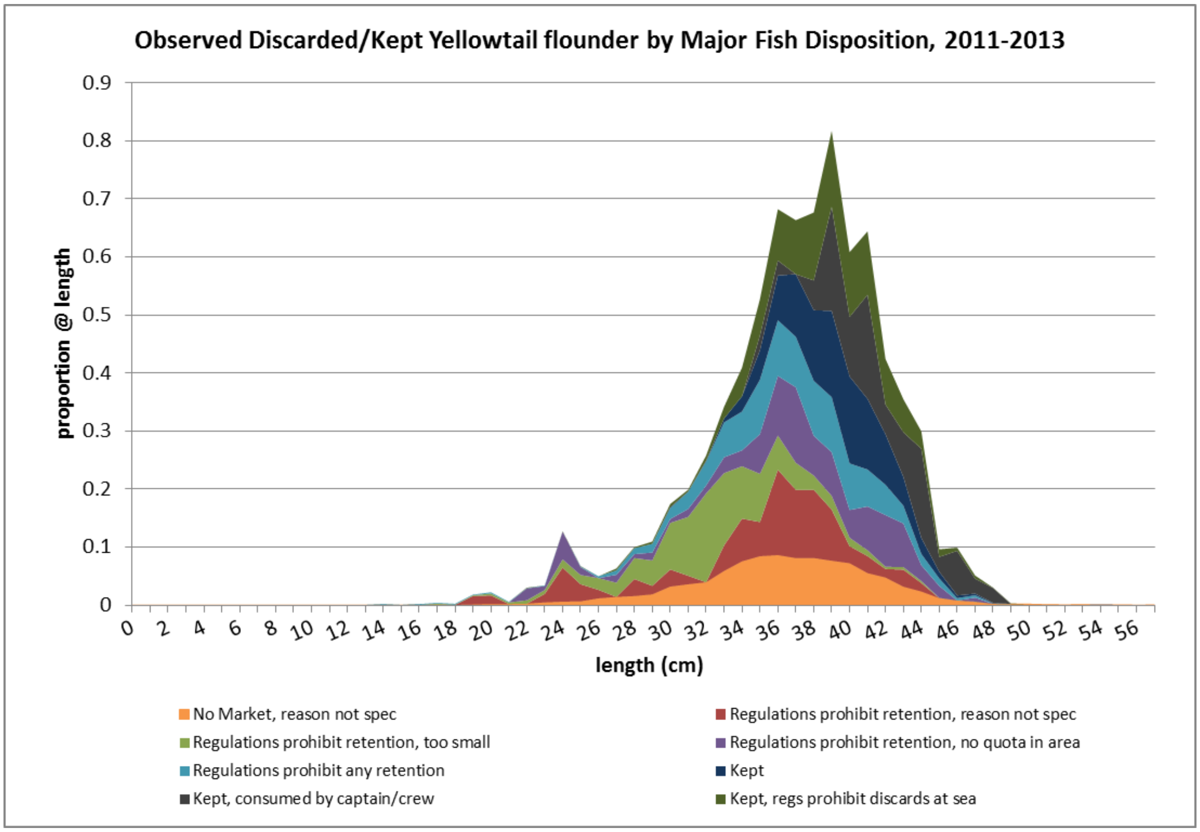
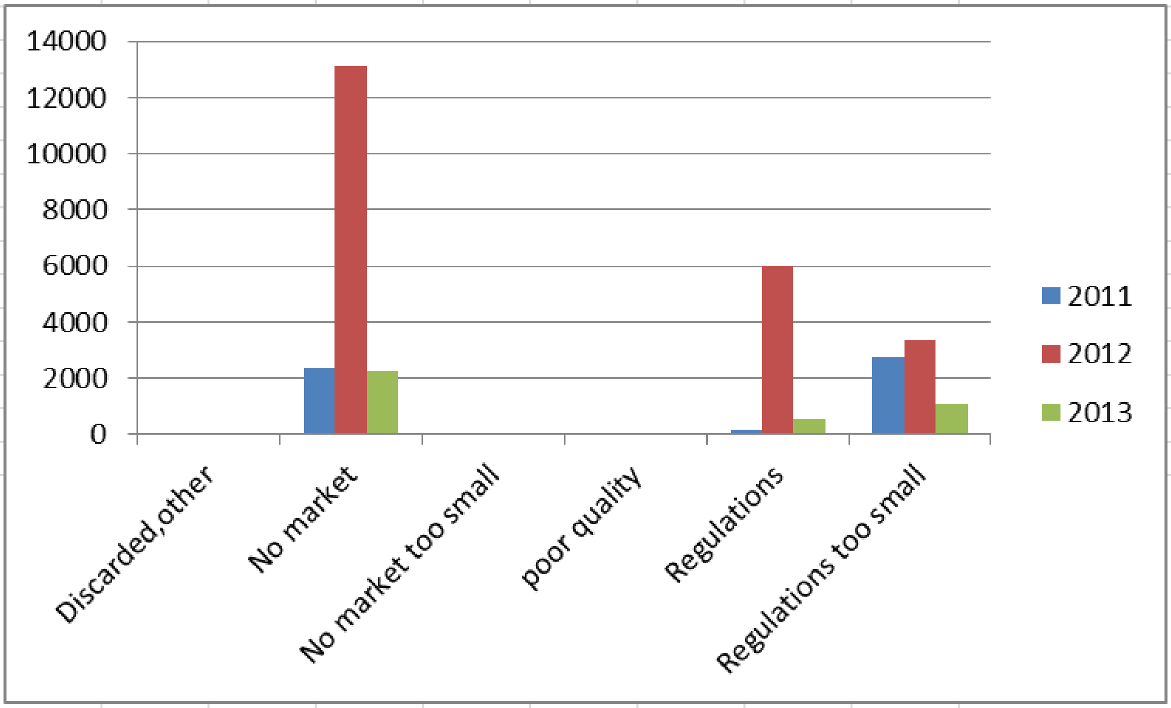


Table 45 – Number of YT measured by disposition category for all hauls where YT measured

Observer Data - Number of Yellowtail flounder Measured by Major Fish Disposition, 2011-2013									
YEAR	No Market, reason not spec	Regulations prohibit retention, reason not spec	Regulations prohibit retention, too small	Regulations prohibit retention, no quota in area	Regulations prohibit any retention	Kept	Kept, consumed by captain/crew	Kept, regs prohibit discards at sea	Grand Total
2011	1531	60	582	146	585	690	2	589	4185
2012	2763		1202		975	923	24	530	6417
2013	1803	8	299		371	122	13	181	2797
Grand Total	6097	68	2083	146	1931	1735	39	1300	13399

Figure 10 - Disposition of YT DISCARDS on all observed scallop hauls by year and area

Sum of YT Flounder DISCARD (lbs) from observed scallop hauls by Fish Disposition Code for Access Areas



Sum of YT Flounder DISCARD (lbs) from observed scallop hauls by Fish Disposition Code for Open Areas

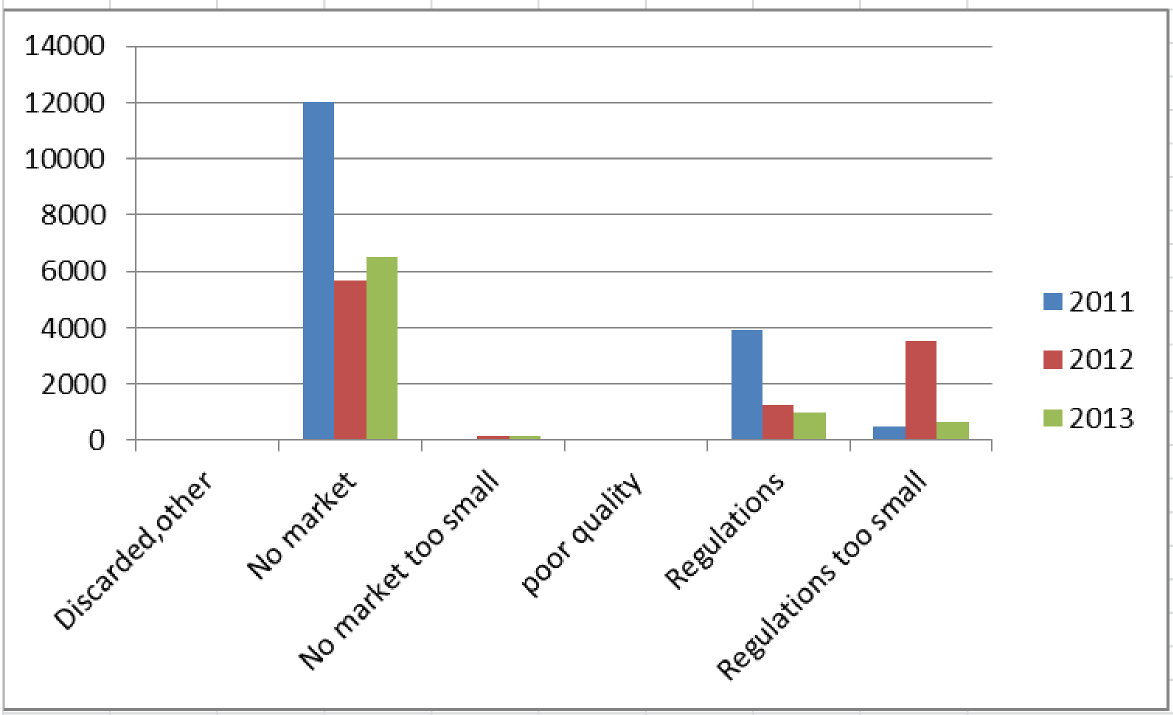
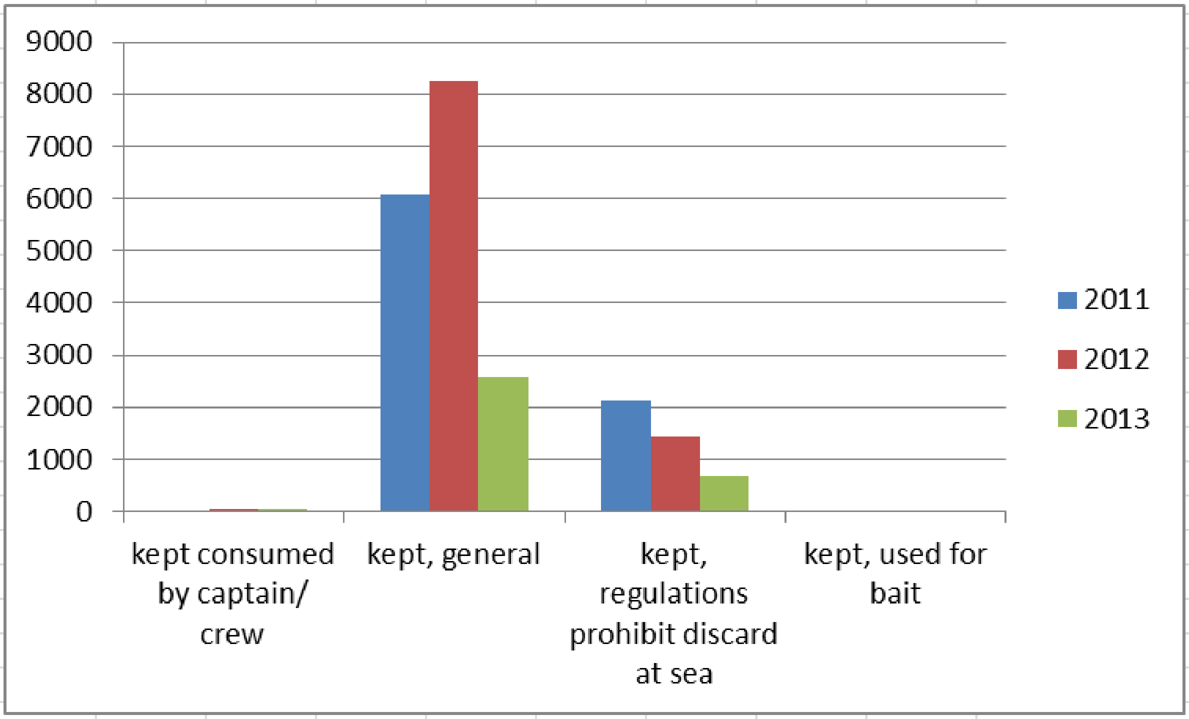
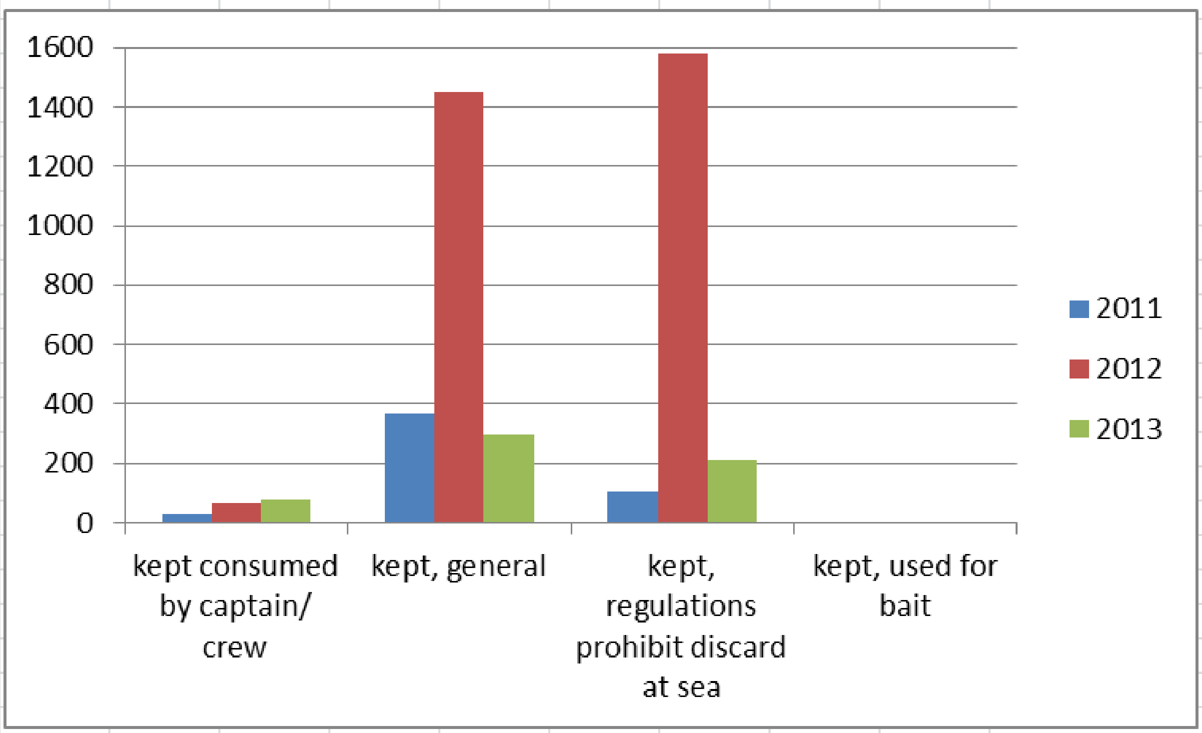


Figure 11 – Disposition of all observed YT KEPT on all observed scallop hauls by year and area

Sum of YT Flounder KEPT (lbs) from observed scallop hauls by Fish Disposition Code for Access Areas



Sum of YT Flounder KEPT (lbs) from observed scallop hauls by Fish Disposition Code for Open Areas



Yellowtail flounder landings for limited access scallop vessels

The following tables summarize *landings*, or kept catch, in the scallop fishery of scallop and yellowtail flounder, and include all trips by limited access scallop vessels from all areas. A small subset of these vessels landed yellowtail flounder in the 2009-2011 fishing years. The majority of the vessels that landed yellowtail flounder had full-time permits (including FTSD and FTTRW permits). However, yellowtail flounder landings more than tripled in 2011 even though the number of vessels that landed yellowtail flounder remained the same. However, yellowtail flounder landings declined in the 2012 fishing year by almost 30%, even though number of LA vessels with yellowtail flounder landings increased from 61 in 2011 to 81 in 2012. Preliminary numbers suggest that yellowtail flounder catch was relatively low so far in the 2013 scallop fishing year (Table 46).

Table 46. Scallop and yellowtail landings by scallop limited access vessels (Dealer data)

Fishyear	Values	Vessels with Yellowtail landings	No yellowtail landings	Grand Total
2009	Scallop lb.	2,752,848	49,348,949	52,101,797
	Yellowtail lb.	36,989	-	36,989
	Number of vessels	19	325	344
2010	Scallop lb.	9,604,501	43,879,121	53,483,622
	Yellowtail lb.	95,246	-	95,246
	Number of vessels	60	289	349
2011	Scallop lb.	10,057,520	44,317,622	54,375,142
	Yellowtail lb.	319,910	-	319,910
	Number of vessels	61	289	350
2012	Scallop lb.	13,855,255	39,269,166	53,124,421
	Yellowtail lb.	226,748	-	226,748
	Number of vessels	81	267	348
2013	Scallop lb.	4,593,347	29,744,058	34,337,405
(Preliminary)	Yellowtail lb.	34,045	-	34,045
(Mar-Nov)	Number of vessels	43	296	339

The trend in yellowtail flounder revenue for limited access vessels was similar to the trend in landings, such that total revenue almost tripled from $136,952 in 2010 to $361,068 in 2011, but declined in 2012 and 2013 (Table 47). Table 48 shows the average landing and revenues by limited access vessels that landed yellowtail flounder. Average yellowtail flounder revenue constituted less than 0.5% of the average scallop revenue in 2009-2013 fishing years, and averaged about $2,000 to 6,000 dollars per vessel depending on the year.

Composition of yellowtail flounder landings and revenue by annual yellowtail flounder catch groups provides further insight about the scallop fishery limited access vessels landing yellowtail flounder (Table

49 to Table 52). A major proportion, 85% to 90% since 2010 fishing year, of the yellowtail flounder landings in the scallop fishery were caught by less than ten vessels with annual yellowtail landings of 10,000 lb. or more. Recently, even fewer vessels with landings of 50,000 lb. or more landed about 45% to 50% of all yellowtail flounder landings while fishing for scallops (Table 50 and Table 51).

Out of the total 60 to 80 scallop vessels that landed any yellowtail flounder since 2010, about 25 to 36 landed 100 lb. or less in a given fishing year and earned, on the average, less than $100 from yellowtail revenue (Table 51 and Table 52). Another 24 to 39 vessels caught greater than 100 lbs to 1,000 lb. since 2010 and on the average earned $300 to $500 per year from yellowtail flounder landings. However, for some scallop vessels, such as those 6 to 11 vessels that landed on the average 3,500 lb. to 4,600 lb., and another handful of vessels (4 to 6) that landed more than 10,000 lb., average annual revenue from yellowtail flounder landings ranged from $3,500 to over $30,000 in 2011 and 2012 fishing years, respectively (Table 52).

Table 47. Scallop and yellowtail revenues for the scallop limited access vessels (Dealer data)

Fishyear	Values	Vessels with Yellowtail landings	No yellowtail landings	Grand Total
2009	Scallop Rev.	17,940,970	317,898,267	335,839,237
	Yellowtail Rev.	52,377	-	52,377
2010	Scallop Rev.	78,844,629	352,319,683	431,164,312
	Yellowtail Rev.	136,952	-	136,952
2011	Scallop Rev.	101,366,017	439,281,278	540,647,295
	Yellowtail Rev.	361,068	-	361,068
2012	Scallop Rev.	138,911,631	378,971,301	517,882,932
	Yellowtail Rev.	283,076	-	283,076
2013*	Scallop Rev.	52,819,011	333,755,591	386,574,602
	Yellowtail Rev.	45,039	-	45,039

*FY not complete

Table 48. Average Scallop and yellowtail landings and revenues (limited access vessels that landed yellowtail, Dealer data)

Fishyear	Number of vessels	Avg.Scal.lb.	Avg.yel. Lb.	Avg.scal. rev.	Avg.yel. rev.	% of yel.rev.
2009	19	144,887	1,947	944,262	2,757	0.3%
2010	60	160,075	1,587	1,314,077	2,283	0.2%
2011	61	164,877	5,244	1,661,738	5,919	0.4%
2012	81	171,053	2,799	1,714,958	3,495	0.2%
2013*	43	106,822	792	1,228,349	1,047	0.1%

*FY not complete

Table 49. Total yellowtail revenue by yellowtail catch group (limited access vessels that landed yellowtail, Dealer data)

Yellowtail lb.	2009	2010	2011	2012	2013
1 to 100 lb.	218	1464	1633	1277	1645
101-1000 lb.	6997	4749	9511	17785	6664
1001 to 10K	NA	NA	21575	51168	NA
10.1K to 50K	NA	122195	NA	NA	NA
GT 50K lb.			NA	NA	
Grand Total	**53190**	**136952**	**361068**	**283076**	**45039**

Table 50. Yellowtail landings by yellowtail lb. group as a percentage of total yellowtail landings (limited access vessels that landed yellowtail, Dealer data)

Yellowtail lb.	2009	2010	2011	2012	2013
1 to 100 lb.	0%	1%	0%	0%	4%
101-1000 lb.	13%	3%	3%	6%	15%
1001 to 10K	54%	6%	6%	18%	34%
10.1K to 50K	32%	89%	41%	30%	47%
GT 50K lb.	0%	0%	50%	45%	0%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**

Table 51. Number of limited access vessels by yellowtail catch group (limited access vessels that landed yellowtail, Dealer data)

Yellowtail lb.	2009	2010	2011	2012	2013
1 to 100 lb.	6	36	25	27	24
101-1000 lb.	9	18	24	39	16
1001 to 10K	NA	NA	6	11	NA
10.1K to 50K	NA	5	4	NA	NA
GT 50K lb.	NA	NA	NA	NA	NA
Grand Total	**20**	**65 or less**	**65 or less**	**81**	**45 or less**

Note: NA indicates that the actual data cannot be shown in order protect confidentiality of data.

Table 52. Average yellowtail revenue by yellowtail catch group (limited access vessels that landed yellowtail, Dealer data)

Yellowtail lb.	2009	2010	2011	2012	2013
1 to 100 lb.	36	41	65	47	69
101-1000 lb.	777	264	396	456	417
1001 to 10K	NA	NA	3,596	4,652	NA
10.1K to 50K	NA	24,439	37,130	NA	NA
GT 50K lb.			NA	NA	NA

Note: NA indicates that the actual data cannot be shown in order protect confidentiality of data.

6.5.11 Small-Mesh Bottom Trawl Fishing on Georges Bank

This action considers measures that could affect fisheries that use small-mesh bottom trawls on Georges Bank. The two primary fisheries that use small-mesh on GB are the longfin squid and whiting fisheries. Often vessels make trips that land both species, so it is not always possible to assign a trip to one fishery or the other. This section provides a brief overview of fishing activity for those two fisheries.

Longfin squid and whiting are primarily caught by bottom otter trawls. The following analyses focus on normal bottom otter trawls, separator trawls, Ruhle trawls, and beam trawls that target these species on Georges Bank. There is also a small percentage of landings that cannot be attributed to a specific gear that is included in the summaries. All weights are converted to live weights. Data are reported for calendar years, consistent with the way the loligo squid fishery is monitored. All data was extracted from the NMFS/NERO DMIS database.

A small number of vessels landed squid or whiting from the GB Yellowtail Flounder Stock (GBYFS) area in 2010 and 2011 (Table 53). Most longfin squid landings in 2010 and 2011 were taken in the SNE/MA area, with <10% of the landings taken in the GBYTFS area (Table 54). Over 95% of the longfin squid caught in the GBYTFS area is caught in SAs 525 and 562 (Table 56). With respect to whiting, however, the GBYTFS area provided between 44% and 48% of total whiting landings (Table 55). Whiting is more broadly distributed in the GBYTFS area, with 25-30% taken in SAs 522 and 525, with most of the remainder from SA 562 (Table 57). The directed small-mesh whiting fishery is restricted to fishing in the Cultivator Shoal Exemption Area, as defined in 50 CFR 648.80(a)(6), from June 15-October 31 of each year.

Table 53 - Number of vessels landing whiting or longfin squid by broad stock area

Stock Area	CY2010	CY2011
Gulf of Maine	32	34
521	8	7
GBYTF Area	34	30
SNE/MA	320	296
Other	30	47
Total	**424**	**414**

Table 54 - Landings of longfin squid by broad stock area (pounds, live weight)

Stock Area	CY2010	CY2011
Gulf of Maine	38,806	17,112
521	4,154	647
GBYTF Area	1,385,159	1,315,051
SNE/MA	15,700,205	20,888,013
Other	60,315	117,520
Total	**17,188,639**	**22,338,343**
GBYTF Area as %	8%	6%

Squid and whiting revenues from the GBYFS area accounted for 24% of the revenues from these species on 2010, and 17% in 2011. For the trips that caught whiting or squid in the GBYTFS area, revenues from these two species accounted for over 60% of trip revenues. Whiting revenues were larger than squid revenues on these trips – squid accounted for 24-33% of the revenues from these two species (

Table 58). Most of the landings from this area were in Massachusetts, with 57% of the revenues in 2010 and 72% of the revenues in 2011. Connecticut, Rhode Island, and New York were other states with most of the revenues from this area (Table 59).

Table 55 - Landings of whiting (silver and offshore hake) by broad stock area (pounds, live weight)

Stock Area	CY2010	CY2011
Gulf of Maine	1,664,758	1,549,340
521	74,296	96,190
GBYTF Area	8,747,531	7,717,515
SNE/MA	7,684,438	7,979,919
Other	183,539	220,894
Total	18,354,562	17,563,858
GB Yellowtail Flounder Area as %	48%	44%

Table 56 - Percent of longfin squid landings from each statistical area in the GB Yellowtail Flounder Stock Area

Statistical Area	CY2010	CY2011	Total
522	4%	1%	3%
525	57%	74%	66%
543	0%	0%	0%
561	0%	0%	0%
562	39%	24%	32%
Total	**100%**	**100%**	**100%**

Table 57 - Percent of whiting landings from each statistical area in the GB Yellowtail Flounder Stock Area

Statistical Area	CY2010	CY2011	Total
522	26.06%	26.62%	26.33%
525	25.73%	39.68%	32.27%
543	0.30%	0.39%	0.34%
561	0.01%	0.01%	0.01%
562	47.90%	33.29%	41.05%
Total	**100.00%**	**100.00%**	**100.00%**

Table 58 - Revenue on squid and/or whiting trips by broad stock areas

Year	Stock Area	Squid Trips	Whiting Trips	Total Revenue
CY2010	Gulf of Maine	$42,269	$1,078,620	$6,849,033
	521	$6,770	$32,410	$1,369,161
	GBYTF Area	$1,638,859	$5,275,521	$10,172,184
	SNE/MA	$16,286,126	$4,780,527	$49,141,364
	Other	$58,925	$93,645	$600,828
	Total	**$18,032,950**	**$11,260,722**	**$68,132,570**
CY2011	Gulf of Maine	$17,318	$999,571	$10,533,557
	521	$952	$77,317	$1,877,336
	GBYTF Area	$1,636,814	$4,725,911	$9,930,530
	SNE/MA	$24,443,913	$5,302,990	$70,296,182
	Other	$155,012	$110,631	$1,104,848

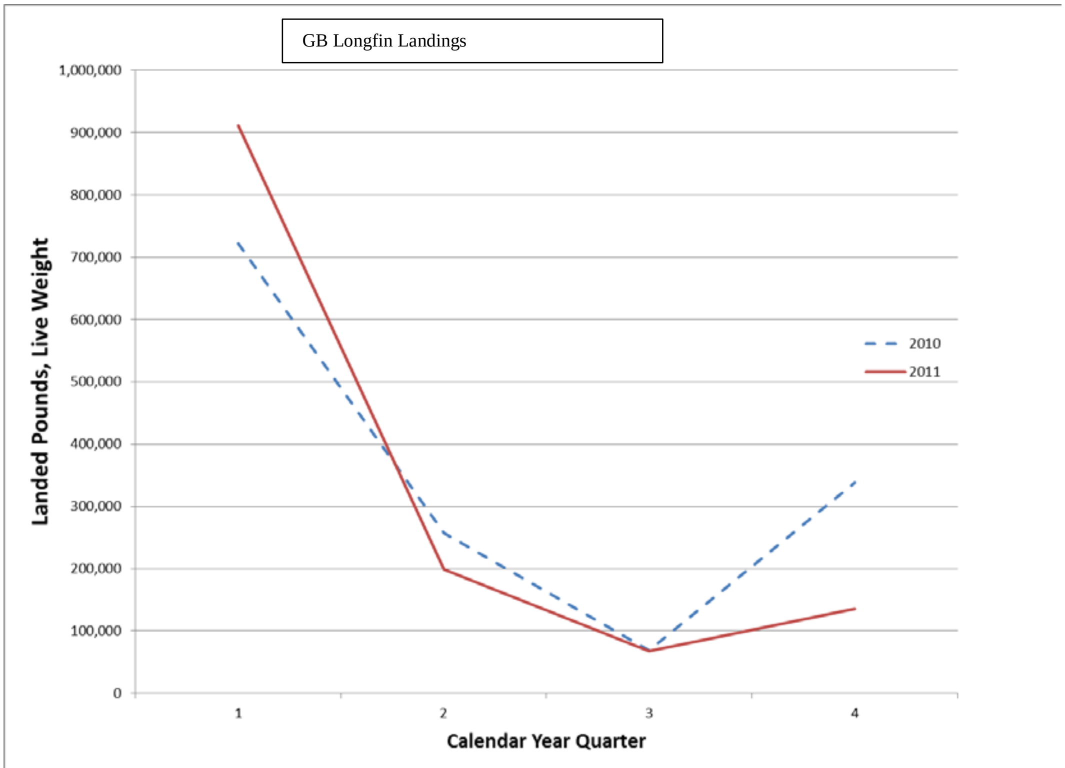
Total	**$26,254,009**	**$11,216,421**	**$93,742,453**

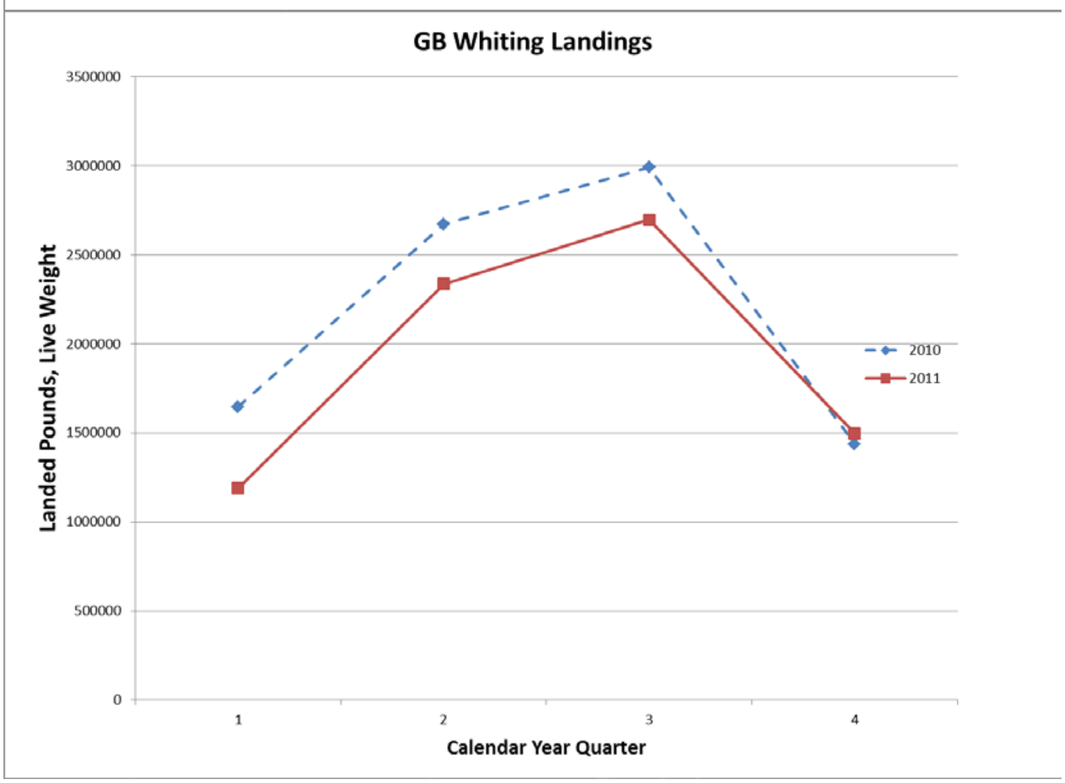
Table 59 - Revenue from squid and whiting trips by state

Year	State	Squid Trips	Whiting Trips	Total Revenue
2010	Other	$5,646	$109,616	$124,367
	CT	$167,228	$846,720	$1,169,255
	MA	$600,953	$3,021,961	$5,846,492
	ME	$0	$239	$53,647
	NY	$347,032	$910,419	$1,399,220
	RI	$517,999	$386,567	$1,579,202
	Total	**$1,638,859**	**$5,275,521**	**$10,172,184**
2011	Other	$5,078	$43,050	$55,195
	CT	$82,915	$429,308	$588,666
	MA	$875,376	$3,805,886	$7,136,582
	ME	$0	$10	$10,443
	NJ	$1,134	$49	$1,433
	NY	$347,829	$276,891	$664,824
	RI	$324,482	$170,718	$1,473,387
	Total	**$1,636,814**	**$4,725,912**	**$9,930,530**

Both longfin and whiting landings have a distinct seasonal component (Figure 12). Longfin landings are high in the fall and winter (first and fourth calendar year quarters) and decline in the spring and summer. Whiting landings have the opposite pattern.

Figure 12 – Seasonal pattern of longfin and whiting landings from Georges Bank





7.0 Environmental Consequences – Analysis of Impacts

7.1 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 have proven unsuccessful. These factors should be considered when reviewing impacts that use this tool.

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

7.1.1.1 Gulf of Maine Cod Rebuilding Strategy

7.1.1.1.1 Option 1: No Action

Impacts on regulated groundfish

This option would keep the current rebuilding strategy for Gulf of Maine cod, which targets rebuilding by 2014 with a 50% (median) probability of success. The direct biological impacts of this measure would be on Gulf of Maine cod. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on 75% F_{MSY} in 2014 and subsequently on incidental bycatch (i.e., set as close to zero as possible) starting in 2015. Option 1 would result in a fishing mortality that would be lower than in Option 2, and thus Option 1 would be expected to result in more rapid rebuilding of the stock.

Three year projections from the two assessment models (base case and m-ramp) are provided (Figure 13 and Figure 14). Differences between the two models are discussed in detail under Option 2.

If F=0, it would take 6 years to rebuild the Gulf of Maine cod stock, which is 2 years earlier than Option 2/Sub-Option A and 4 years earlier than Option 2/Sub-Option B. Under No Action, the stock would not rebuild by 2014 but would rebuild by 2020 if F=0 (Figure 19and Figure 20).

This option could also have indirect effects on other regulated groundfish stocks, since Gulf of Maine cod is only part of a complex fishery. For example, during some times of the year, Gulf of Maine cod and Gulf of Maine haddock are caught on the same fishing trips. Limiting Gulf of Maine cod catches may reduce catches of Gulf of Maine haddock because it may deter some groundfish fishing trips (as compared to Option 2).

Impacts on other species

When compared to Option 2, this option may indirectly reduce interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips because it may lead to fewer groundfish fishing trips in the Gulf of Maine cod stock area. Counter to this possibility is the chance that vessels that would fish for Gulf of Maine cod under Option 2, may target other species as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, should prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets.

Figure 13 - Projected GOM cod stock size under Option 1 base case scenario

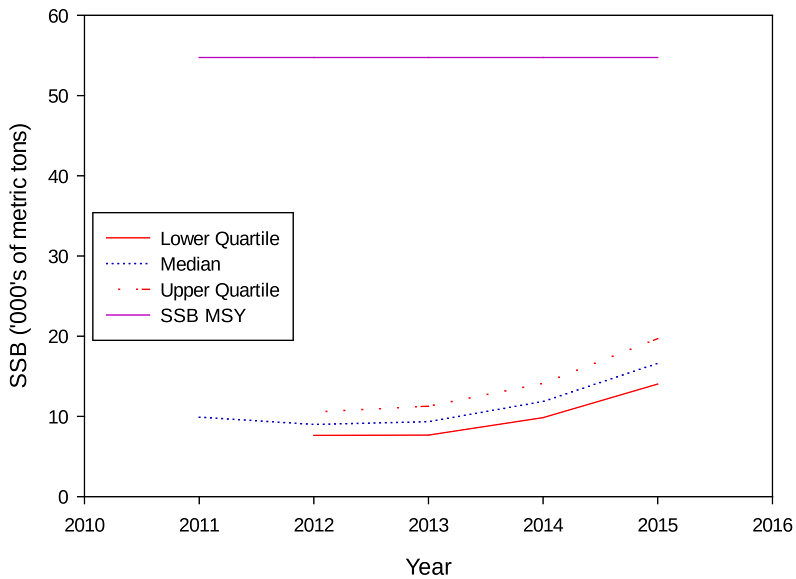
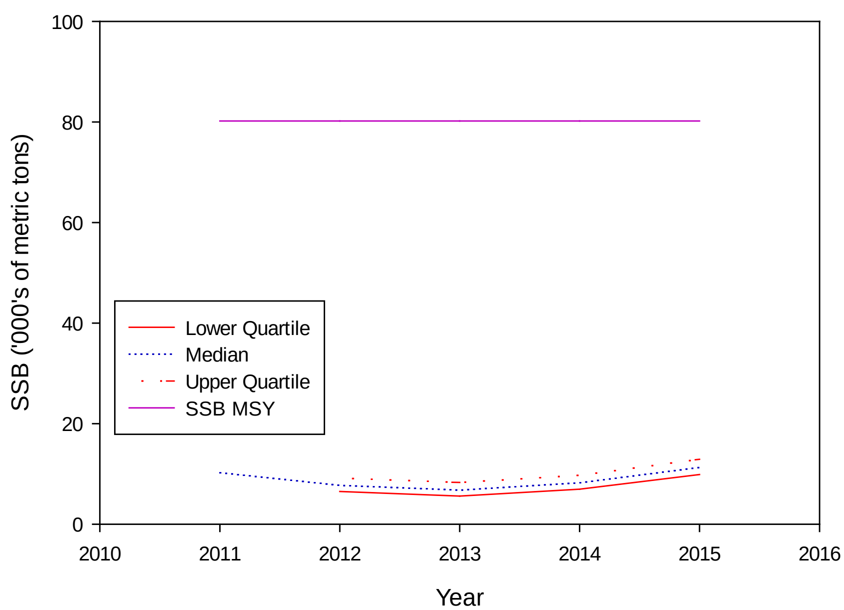


Figure 14 - Projected GOM cod stock size under Option 1 M ramp scenario



7.1.1.1.2 Option 2: Revised Rebuilding Strategy for Gulf of Maine Cod

Sub-Option A

Impacts on regulated groundfish

This option would adopt a new rebuilding strategy for Gulf of Maine cod and would target rebuilding by 2022 with a 50% (median) probability of success. The assumption is that this change would lead to an additional change in management measures that would allow fishermen to land this stock. The direct impacts of this measure would be on Gulf of Maine cod. The fishing mortality (initially greater than 75% F_{MSY}, but reduced after 2014 would be consistent with the ABC Control Rule adopted in A16) necessary to rebuild by 2022 would be greater than would be expected under Option 1/No Action. This would be expected to result in slower rebuilding of the stock. Under Option 2/Sub-Option A, the stock would rebuild by 2022 (Figure 15 and Figure 16). The rebuilding trajectory for this option is compared to the trajectory for F=0 and No Action (Option 1) in Figure 19 and Figure 20.The stock would rebuild two years later than the rebuilding date expected under Option 1/No Action, and two years earlier than the rebuilding date expected under Option 2/Sub-Option B. This strategy is developed to be more conservative compared to Option 2/Sub-Option B, and have minor negative impacts on GOM cod relative to Option1/No Action.

This option could also have indirect effects on other regulated groundfish stocks, since Gulf of Maine cod is only part of a complex fishery. During some times of the year, Gulf of Maine cod and Gulf of Maine haddock are caught on the same fishing trips. Increasing Gulf of Maine cod catches (as compared to Option 1/No Action) may increase catches of Gulf of Maine haddock because it may encourage more groundfish fishing trips. Since this stock is managed with ACLs and AMs, fishing mortality targets would not be expected to be exceeded.

Several provisions of this measure may slow the pace of rebuilding. First, this program is designed to use 75%F_{MSY} initially; however, if progress is not made, it is possible that $F_{rebuild}$ may become necessary. Second, there is little difference in the rebuilding time needed under the accepted base case or M-ramp model (M=0.2 in projections) for GOM cod; no reference points are available for the M-ramp model. However the catches estimated in the out years and the SSB_{MSY} are different between the models. The M-ramp projection assumes a change in M back to 0.2. The SARC 55 Panel concluded that if M is currently 0.4 then it seemed more reasonable to assume that in the short-term M would remain at 0.4 rather than reduce to 0.2. However, a change back to 0.2 is required to rebuild the stock. It is not known when M will change back to 0.2 in the future for the M-ramp formulation so interpretation and development of rebuilding plans using the M-ramp model is more difficult. This option would not rebuild as quickly and would have very low negative impacts when compared to Option 1/No Action.

Impacts on other species

When compared to Option 1/No Action, this option may indirectly increase negative interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips if it leads to more groundfish fishing trips, which would negatively impact these species. Counter to this possibility is the chance that vessels that would fish for other species under Option 1/No Action may target Gulf of Maine cod as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, would prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets. Therefore, the anticipated impacts are expected to be negligible.

Figure 15 - Projected GOM cod stock size under Option 2, 8 year rebuilding base case scenario

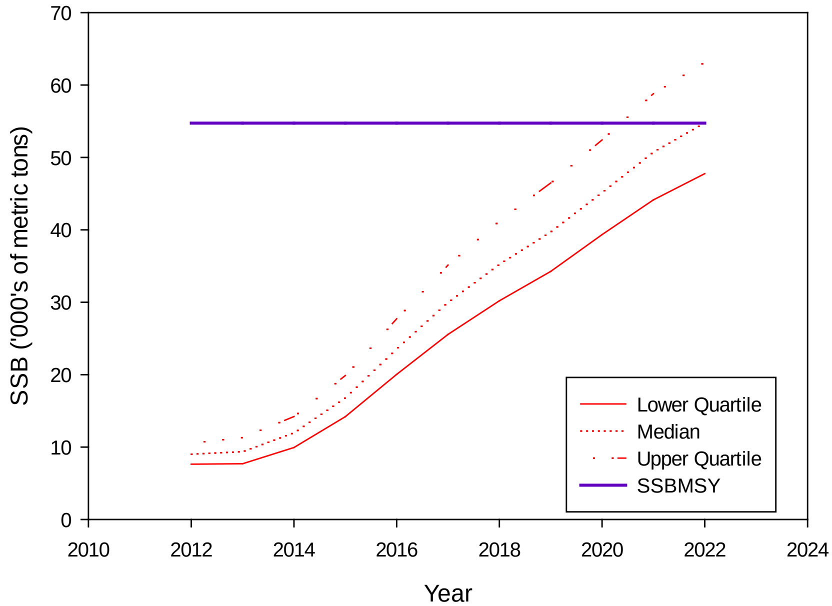
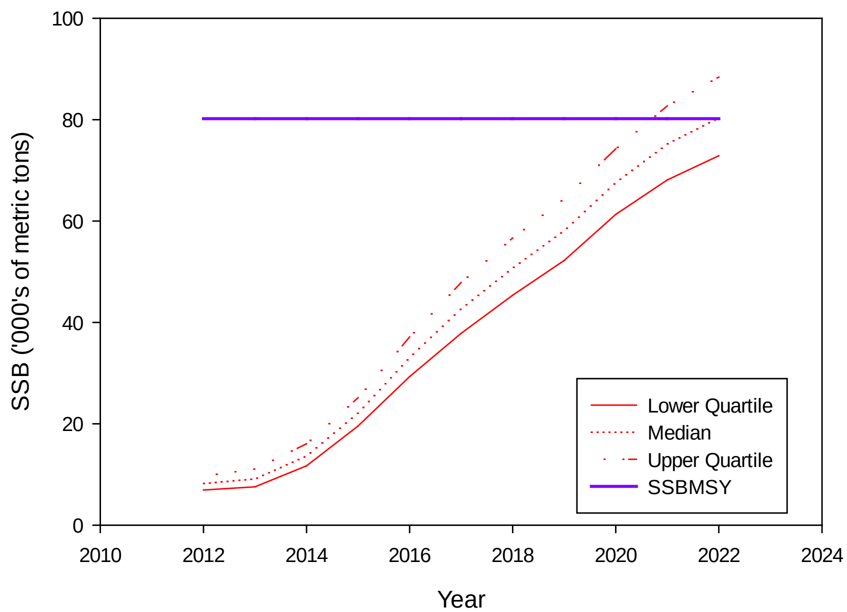


Figure 16 - Projected GOM cod stock size under Option 2, 8 year rebuilding M ramp scenario



Sub-Option B

Impacts on regulated groundfish

This option would adopt a new rebuilding strategy for Gulf of Maine cod and would target rebuilding by 2024 with a 50% (median) probability of success. The assumption is that this change would lead to an additional change in management measures that would allow fishermen to land this stock. The direct impacts of this measure would be on Gulf of Maine cod. The fishing mortality (initially greater than 75% F_{MSY}, but reduced after 2014 would be consistent with the ABC Control Rule adopted in A16) necessary to rebuild by 2024 would be greater than would be expected under Option 1/No Action. This would be expected to result in slower rebuilding of the stock. Under Option 2/Sub-Option B, the stock would rebuild by 2024 (Figure 17 and Figure 18). The rebuilding trajectory for this option is compared to the trajectory for F=0 and No Action (Option 1) in Figure 19 and Figure 20.The stock would rebuild four years later than the rebuilding date expected under Option 1/No Action, and two years later than the rebuilding date expected under Option 2/Sub-Option A. This option represents the maximum rebuilding period of ten years from the implementation date of the program. The rebuilding period is extended to the maximum period in order to minimize the impacts on fishing communities, as described in 7.5.1.1.2.

This option could also have indirect effects on other regulated groundfish stocks, since Gulf of Maine cod is only part of a complex fishery. During some times of the year, Gulf of Maine cod and Gulf of Maine haddock are caught on the same fishing trips. Increasing Gulf of Maine cod catches (as compared to Option 1/No Action) may increase catches of Gulf of Maine haddock because it may encourage more groundfish fishing trips. Since this stock is managed with ACLs and AMs, fishing mortality targets would not be expected to be exceeded.

Several provisions of this measure may slow the pace of rebuilding. First, this program is designed to use 75%F_{MSY} initially; however, if progress is not made, it is possible that $F_{rebuild}$ may become necessary. Second, there is little difference in the rebuilding time needed under the accepted base case or M-ramp model (M=0.2 in projections) for GOM cod; no reference points are available for the M-ramp model. However the catches estimated in the out years and the SSB_{MSY} are different between the models. The M-ramp projection assumes a change in M back to 0.2. The SARC 55 Panel concluded that if M is currently 0.4 then it seemed more reasonable to assume that in the short-term M would remain at 0.4 rather than reduce to 0.2. However, a change back to 0.2 is required to rebuild the stock. It is not known when M will change back to 0.2 in the future for the M-ramp formulation so interpretation and development of rebuilding plans using the M-ramp model is more difficult. This strategy is less conservative compared to Option 2/Sub-Option A. This option would not rebuild as quickly and would have very low negative impacts when compared to Option 1/No Action.

Impacts on other species

When compared to Option 1/No Action, this option may indirectly increase interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips if it leads to more groundfish fishing trips. Counter to this possibility is the chance that vessels that would fish for other species under Option 1/No Action may target Gulf of Maine cod as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, would prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets.

Figure 17 - Projected GOM cod stock size under Option 2, 10 year rebuilding base case scenario

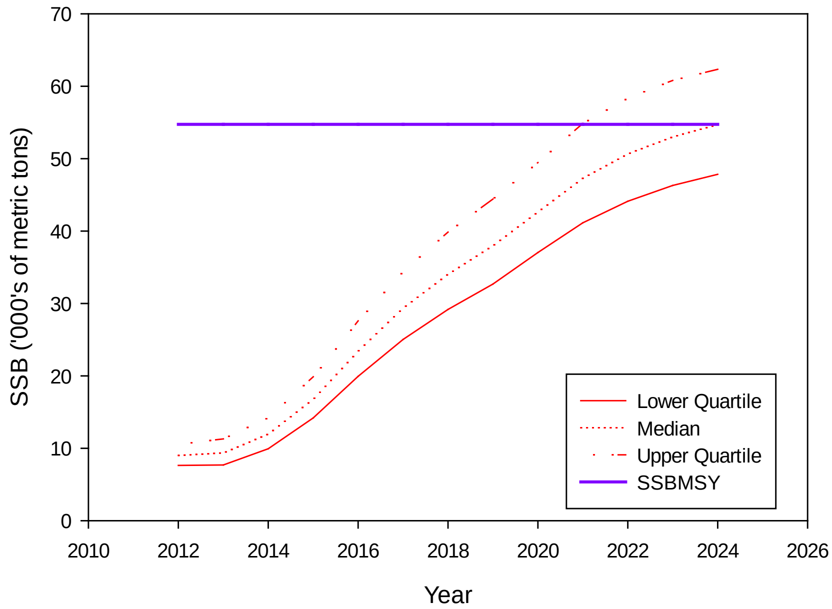


Figure 18 - Projected GOM cod stock size under Option 2, 10 year rebuilding M ramp scenario

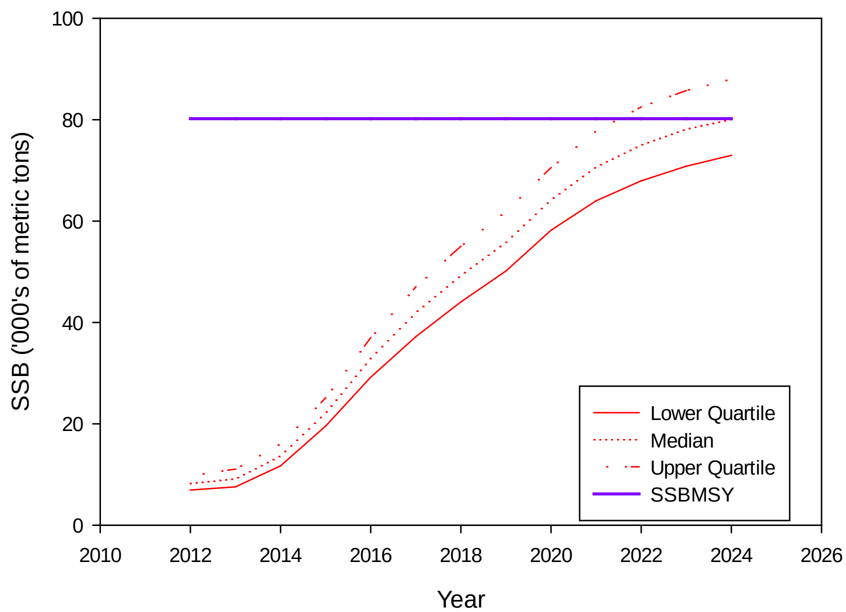


Figure 19 – Projected median SSB_{MSY} for GOM cod rebuilding strategies, using the base case model

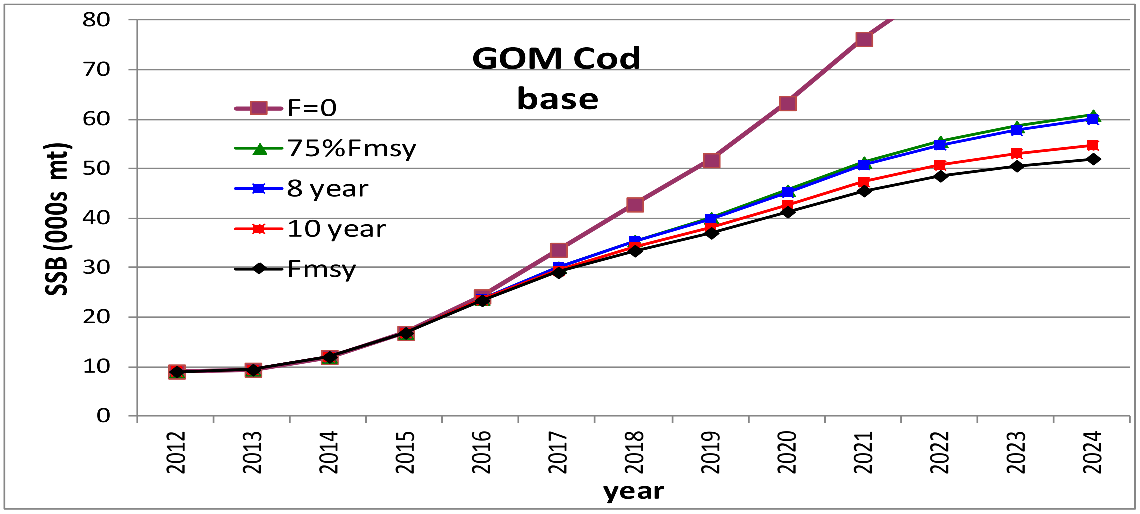
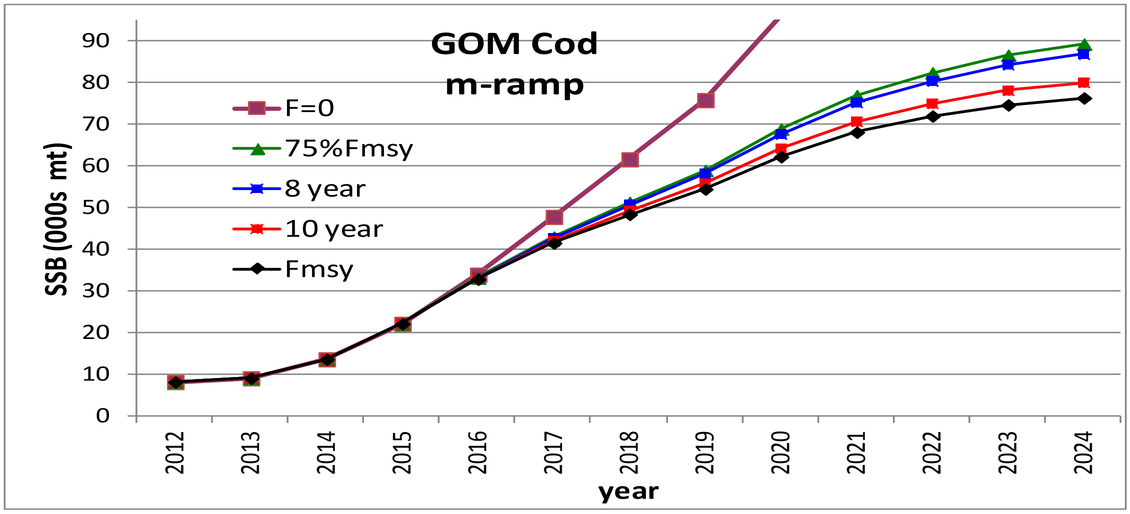


Figure 20- Projected median SSB_{MSY} for GOM cod rebuilding strategies, using the m-ramp model



7.1.1.1.3 Option 3: Rebuilding Plan Review Analysis for Gulf of Maine Cod

Impacts on regulated groundfish

Option 3 would require an analysis of the rebuilding plan using the described criteria. This is an administrative alternative and is not expected to impact Gulf of Maine cod or other species. Compared to the No Action alternative and Option 2, this alternative would not impact Gulf of Maine cod or other regulated 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.

7.1.1.2 Revised American Plaice Rebuilding Strategy

7.1.1.2.1 Option 1: No Action

Impacts on regulated groundfish

This option would keep the current rebuilding strategy for American plaice, which targets rebuilding by 2014 with a 50% (median) probability of success. The direct biological impacts of this measure would be on American plaice. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on 75% F_{MSY} in 2014 and subsequently on incidental bycatch (i.e., set as close to zero as possible) starting in 2015. Three year projections from the assessment model are provided (Figure 21). Option 1 would result in a fishing mortality that would be lower than in Option 2, and thus Option 1 would be expected to result in more rapid rebuilding of the stock. If F=0, it would take 4 years to rebuild the Gulf of Maine cod stock, which is 3 years earlier than Option 2/Sub-Option A, 4 years earlier than Option 2/Sub-Option B, and 6 years earlier than Option 2/Sub-Option C. Under Option 1/No Action, the stock would not rebuild by 2014, but the stock would rebuild by 2018 if F=0 (Figure 25).

This option could also have indirect effects on other regulated groundfish stocks, since American plaice is only part of a complex fishery. For example, during some times of the year, American plaice and witch flounder are caught on the same fishing trips. Limiting American plaice catches may reduce catches of witch flounder because it may deter some groundfish fishing trips (as compared to Option 2).

Impacts on other species

When compared to Option 2, this option may indirectly reduce interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips because it may lead to fewer groundfish fishing trips in the American plaice stock area. Counter to this possibility is the chance that vessels that would fish for American plaice under Option 2, may target other species as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, should prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets.

Figure 21 - Projected American Plaice stock size under Option 1

7.1.1.2.2 Option 2: Revised Rebuilding Strategy for American Plaice

<u>Sub-Option A</u>

Impacts on regulated groundfish

This option would adopt a new rebuilding strategy for American plaice and would target rebuilding by 2021 with a 50% (median) probability of success. The assumption is that this change would lead to an additional change in management measures that would allow fishermen to land this stock. The direct impacts of this measure would be on American plaice. The fishing mortality (initially greater than 75% F_{MSY}, but reduced after 2014 would be consistent with the ABC Control Rule adopted in A16) necessary to rebuild by 2021 would be greater than would be expected under Option 1/No Action. This would be expected to result in slower rebuilding of the stock. Under Option 2/Sub-Option A, the stock would rebuild by 2021 Figure 22. The rebuilding trajectory for this option is compared to the trajectory for F=0 and No Action (Option 1) in Figure 25.The stock would rebuild three years later than the rebuilding date expected under Option 1/No Action, one year earlier than the rebuilding date expected under Option 2/Sub-Option B, and three years earlier than the rebuilding date expected under Option 2/Sub-Option C. This strategy is the most conservative compared to Option 2/Sub-Option B and Option2/Sub-Option C.

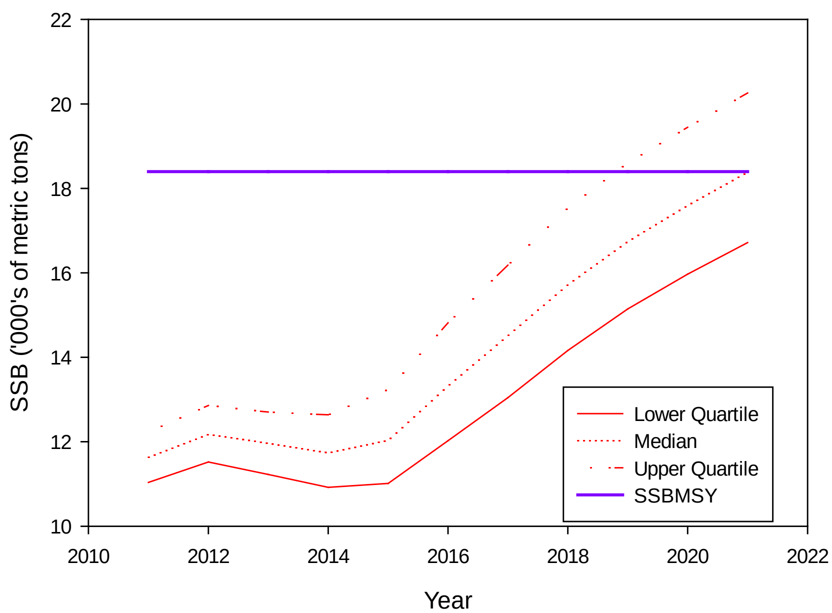
This option could also have indirect effects on other regulated groundfish stocks, since American plaice is only part of a complex fishery. During some times of the year, American plaice and witch flounder are caught on the same fishing trips. Increasing American plaice catches (as compared to Option 1/No Action) may increase catches of witch flounder because it may encourage more groundfish fishing trips. Since this stock is managed with ACLs and AMs, fishing mortality targets would not be expected to be exceeded.

One provision of this measure may slow the pace of rebuilding. This program is designed to use 75%F_{MSY} initially; however, if progress is not made, it is possible that $F_{rebuild}$ may become necessary. This option would not rebuild as quickly as Option 1/No Action.

Impacts on other species

When compared to Option 1/No Action, this option may indirectly increase interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips if it leads to more groundfish fishing trips. Counter to this possibility is the chance that vessels that would fish for other species under Option 1 /No Action may target American plaice as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, would prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets.

Figure 22 - Projected American Plaice stock size under Option 2, 7 year rebuilding scenario



Sub-Option B

Impacts on regulated groundfish

This option would adopt a new rebuilding strategy for American plaice and would target rebuilding by 2022 with a 50% (median) probability of success. The assumption is that this change would lead to an additional change in management measures that would allow fishermen to land this stock. The direct impacts of this measure would be on American plaice. The fishing mortality (initially greater than 75% F_{MSY}, but reduced after 2014 would be consistent with the ABC Control Rule adopted in A16) necessary to rebuild by 2022 would be greater than would be expected under Option 1/No Action. This would be expected to result in slower rebuilding of the stock. Under Option 2/Sub-Option B, the stock would rebuild by 2022 (Figure 23). The rebuilding trajectory for this option is compared to the trajectory for F=0 and No Action (Option 1) in Figure 25.The stock would rebuild four years later than the rebuilding date expected under Option 1/No Action, one year later than the rebuilding date expected under Option 2/Sub-Option A, and two years earlier than the rebuilding date expected under Option 2/Sub-Option C.

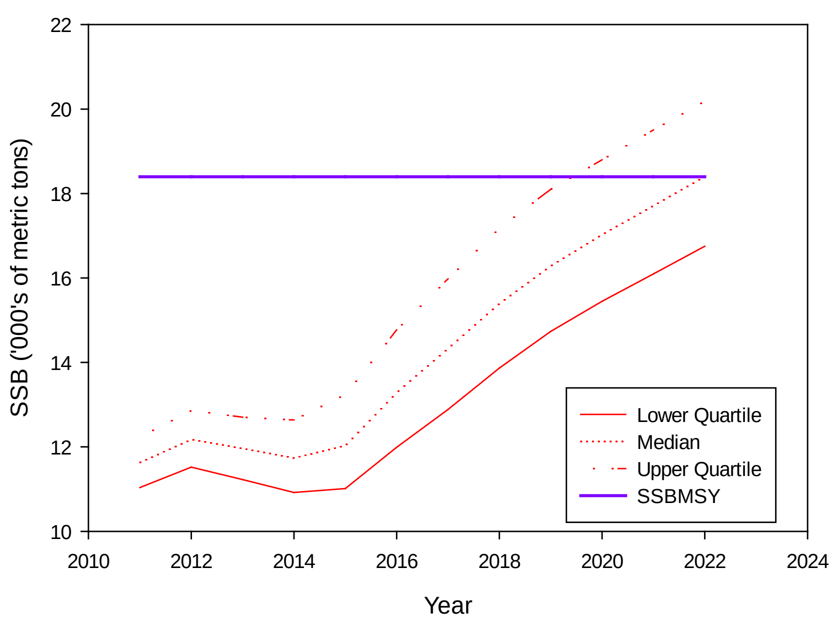
This option could also have indirect effects on other regulated groundfish stocks, since American plaice is only part of a complex fishery. During some times of the year, American plaice and witch flounder are caught on the same fishing trips. Increasing American plaice catches (as compared to Option 1/No Action) may increase catches of witch flounder because it may encourage more groundfish fishing trips. Since this stock is managed with ACLs and AMs, fishing mortality targets would not be expected to be exceeded.

One provision of this measure may slow the pace of rebuilding. This program is designed to use 75%F_{MSY} initially; however, if progress is not made, it is possible that $F_{rebuild}$ may become necessary. This option would not rebuild as quickly as Option 1/No Action.

Impacts on other species

When compared to Option 1/No Action, this option may indirectly increase interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips if it leads to more groundfish fishing trips. Counter to this possibility is the chance that vessels that would fish for other species under Option 1 /No Action may target American plaice as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, would prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets.

Figure 23 - Projected American Plaice stock size under Option 2, 8 year rebuilding scenario



Sub-Option C

Impacts on regulated groundfish

This option would adopt a new rebuilding strategy for American plaice and would target rebuilding by 2024 with a 50% (median) probability of success. The assumption is that this change would lead to an additional change in management measures that would allow fishermen to land this stock. The direct impacts of this measure would be on American plaice. The fishing mortality (initially greater than 75% F_{MSY}, but reduced after 2014 would be consistent with the ABC Control Rule adopted in A16) necessary to rebuild by 2024 would be greater than would be expected under Option 1/No Action. This would be expected to result in slower rebuilding of the stock. Under Option 2/Sub-Option B, the stock would rebuild by 2024 (Figure 24). The rebuilding trajectory for this option is compared to the trajectory for F=0 and No Action (Option 1) in Figure 25.The stock would rebuild six years later than the rebuilding date expected under Option 1/No Action, three years later than the rebuilding date expected under Option 2/Sub-Option A, and two years later than the rebuilding date expected under Option 2/Sub-Option B. This option represents the maximum rebuilding period of ten years from the implementation date of the program. The rebuilding period is extended to the maximum period in order to minimize the impacts on fishing communities, as described in 7.5.1.2.2.

This option could also have indirect effects on other regulated groundfish stocks, since American plaice is only part of a complex fishery. During some times of the year, American plaice and witch flounder are caught on the same fishing trips. Increasing American plaice catches (as compared to Option 1/No Action) may increase catches of witch flounder because it may encourage more groundfish fishing trips. Since this stock is managed with ACLs and AMs, fishing mortality targets would not be expected to be exceeded.

One provision of this measure may slow the pace of rebuilding. This program is designed to use 75%F_{MSY} initially; however, if progress is not made, it is possible that $F_{rebuild}$ may become necessary. This option would not rebuild as quickly as Option 1/No Action.

Impacts on other species

When compared to Option 1/No Action, this option may indirectly increase interactions between the groundfish fishery and other species that are caught as bycatch on groundfish fishing trips if it leads to more groundfish fishing trips. Counter to this possibility is the chance that vessels that would fish for other species under Option 1 /No Action may target American plaice as a substitute. It is not clear how these two different behaviors would interact and whether the net result would be more or less catches of other species. ACL and AM systems for other stocks, however, would prevent overfishing from occurring in either case and so the possible impacts would not be expected to compromise mortality targets.

Figure 24 - Projected American Plaice stock size under Option 2, 10 year rebuilding scenario

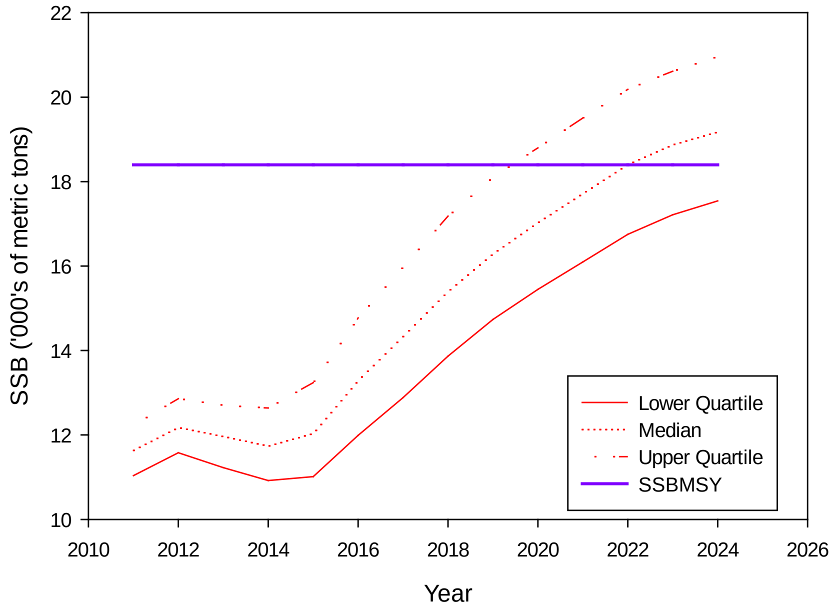
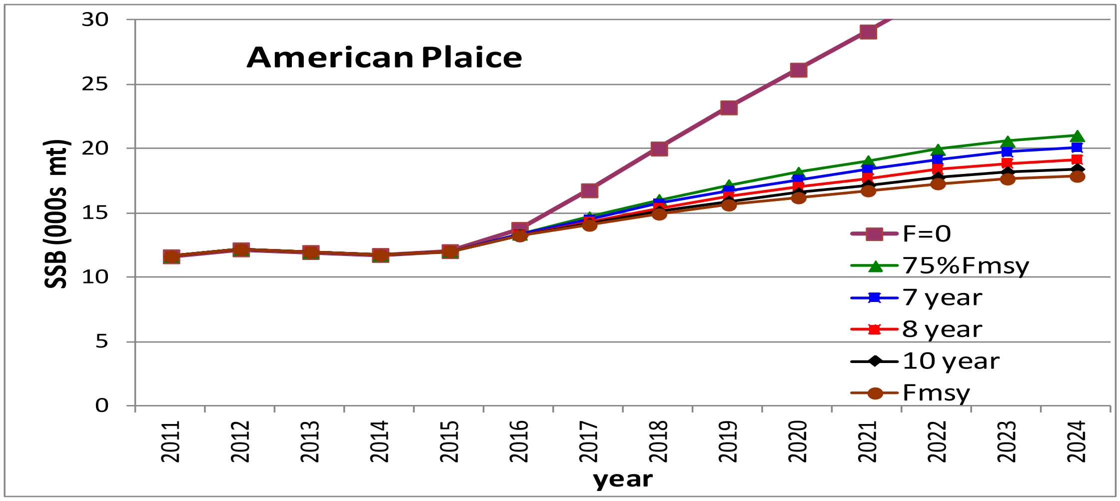


Figure 25- Projected median SSB_{MSY} for American plaice rebuilding strategies



7.1.1.2.3 Option 3: Rebuilding Plan Review Analysis for American Plaice

Impacts on regulated groundfish

Option 3 would require an analysis of the rebuilding plan using the described criteria. This is an administrative alternative and is not expected to impact American plaice or other species. Compared to the No Action alternative and Option 2, this alternative would not impact American plaice or other regulated 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.

7.1.1.3 Annual Catch Limits

7.1.1.3.1 Option 1: No Action

Impacts on regulated groundfish

Two groundfish stocks, white hake and GB yellowtail flounder, do not have FY 2014 specifications defined in previous actions. This option would not set specifications for these stocks in FY 2014; stocks with FY 2014 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.

For FY 2013, specifications were defined for white hake and GB yellowtail flounder stocks. However under Option 1/No Action, no Overfishing Level (OFL), Acceptable Biological Catch (ABC) or ACLs would be defined for white hake and GB yellowtail flounder 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. What these provisions mean is that in most cases there will be little opportunity for sector vessels to fish on stocks that have an ACL under this option because of this requirement. Since there would be no allocations for white hake and GB yellowtail flounder, the only area that most groundfish fishing activity could occur is the SNE area. 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.

An age-based projection model was used to estimate the short-term impacts on stock size of setting the ABCs for white hake and GB yellowtail flounder. 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 two stocks.

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.

White Hake

Under Option 1, white hake 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.

GB Yellowtail Flounder

Under Option 1, Georges Bank yellowtail flounder biomass is projected to increase slightly but it remains well below the SSB_{MSY} (Figure 27). Option 1 would allow for greater increases in SSB than Option 2.

Figure 26 - Projected White Hake stock size under Option 1

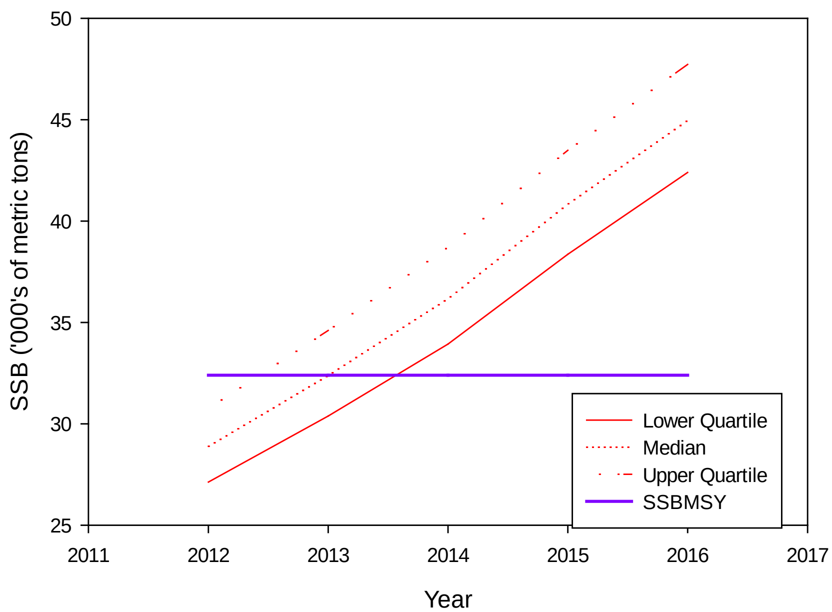
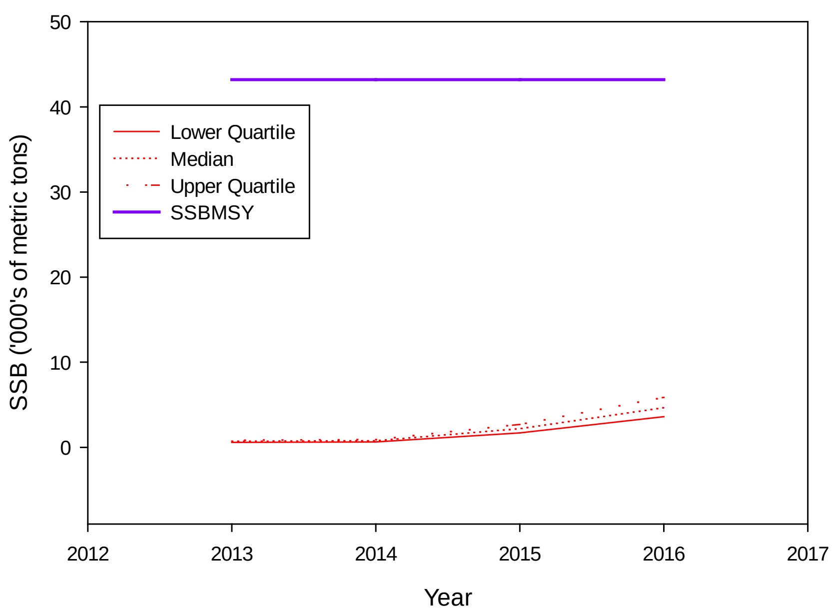


Figure 27 - Projected Georges Bank yellowtail flounder stock size under Option 1



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

Option 2 would adopt new ABCs consistent with the best available science for GB yellowtail flounder (FY 2014) and white hake (FY 2014-2016). The ABCs for other stocks were set in previous actions and not discussed here. Generally, increases in SSB are lower than those under Option 1.

Both stocks had recent 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. There is one factor that could modify this conclusion. Sectors are allowed to carry-over up to ten percent of their original ACE allocation to the following year if it is not caught for all stocks except those managed under the US/CA Understanding (e.g., GB yellowtail flounder). This possibility and its effect on stock status is discussed later in this section.

Projected stock sizes are shown in Figure 28 and Figure 29. A comparison of probability of overfishing between the two options is difficult as Option 1/No Action has no OFLs defined for white hake and GB yellowtail flounder. For FY 2013, OFLs were defined for these stocks.

With respect to GB yellowtail flounder there is additional uncertainty in the short-term projection because the most recent assessment shows a retrospective pattern that over-estimates stock size and under-estimates fishing mortality in the terminal year of the assessment. An OFL has been declared undeterminable for this stock because of the large uncertainty about the assessment (Science and Statistical Committee, pers. Comm.). There is some uncertainty with regard to whether the ABC would ensure that overfishing is not occurring, however, the SSC determined that maintaining an ABC of 500mt would afford the stock a better chance to show a response than in recent years.

White Hake
White hake SSB projections indicate a further increase in SSB above the SSB_{MSY} under this scenario (Figure 28).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 Yellowtail Flounder
This stock is well below the SSB_{MSY}. Marginal increases in SSB occur under Option 2 catch of 400 mt (Figure 29). Slightly greater increases in SSB occur under Option 1 than Option 2.

Figure 28 - Projected White Hake stock size under Option 2

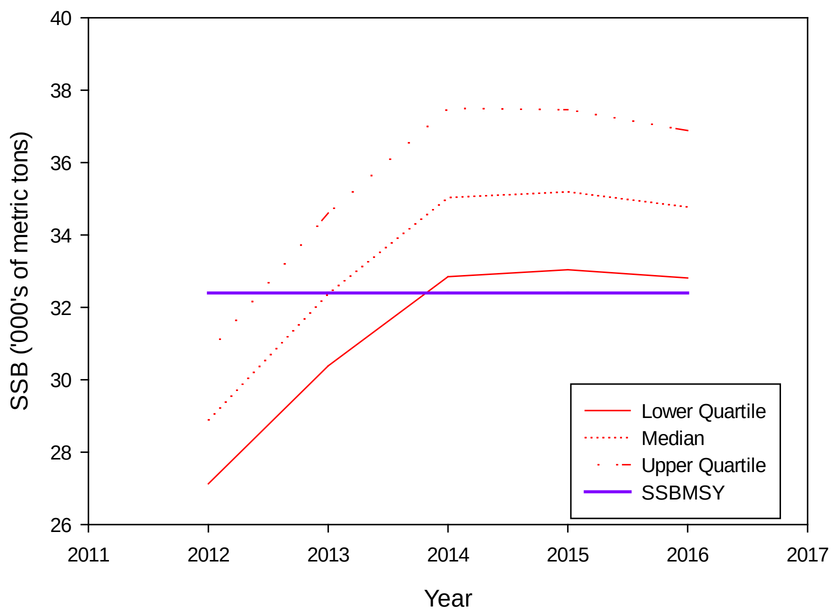
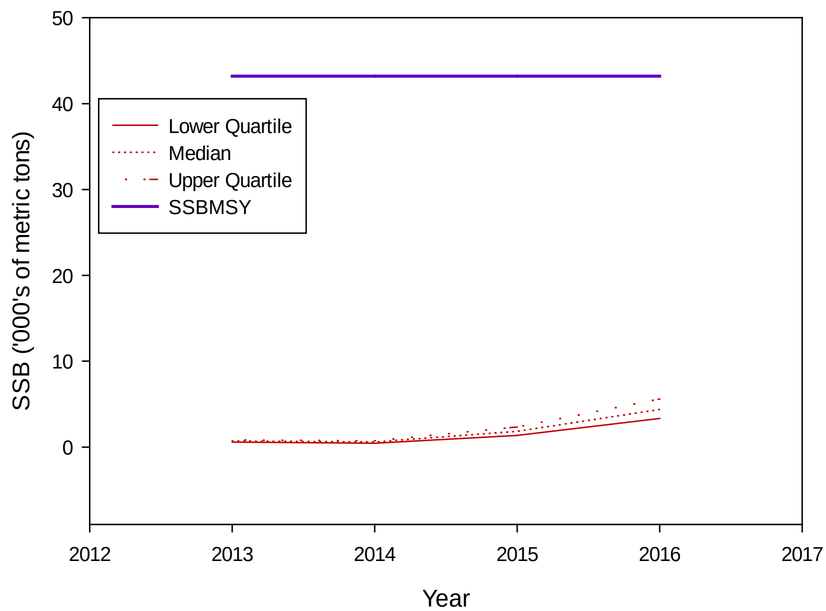


Figure 29 - Projected GB Yellowtail Flounder stock size under Option 2 (split series, rho adjusted, 400 mt)



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.

Additional species that could be affected by this option would be Atlantic sea scallops and species captured by small-mesh fisheries. The specified sub-ACLs of GB yellowtail flounder for the sea scallop fishery and small-mesh fisheries are designed to limit the incidental catch of yellowtail flounder by the scallop fishery and small-mesh fisheries. For the scallop fishery, allocations that are exceeded result in triggering AMs in subsequent years. AMs for small-mesh fisheries are being considered in this action. The sub-ACLs can affect fishing mortality and stock size of sea scallops and species captured by small-mesh fisheries through this mechanism.

Impacts of Sector Carry-Over on Biological Impacts

Framework 50 used 305(d) of MSA to clarify carryover, which remains unchanged; however, how NMFS accounts for carryover that is used in determining if accountability measures (AMs) are necessary will be handled differently beginning in FY 2014 and beyond (see Appendix V in the FW 50 Environmental Assessment for a more detailed explanation). Carryover does not apply to those stocks managed under the US/CA Understanding (i.e., Eastern Georges Bank cod, Eastern Georges Bank haddock, and Georges Bank yellowtail flounder).

Under the clarified carryover program, there are two components: A *de minimus* amount automatically provided that is not expected to cause any ACL overage and changes to catch accounting for sectors that bring forward and use more than the *de minimus* amount (up to the full 10% available).

NMFS is in the process of determining an appropriate *de minimus* amount for each stock and will provide the analysis to the Council at a later date. The *de minimus* amount is expected to be quite small so that it falls within the management uncertainty for the fishery and would not, if fully utilized, cause the sector sub-ACL to be exceeded. As such, it is expected to be consistent with National Standard 1 guidance.

Under the clarified program, sectors can continue to bring forward up to 10% of unused ACE from the previous fishing year. If this carryover is used in subsequent year (e.g., FY 2013 carryover used in FY 2014) there are two possible outcomes under the clarification:

- If the total fishery level ACL is not exceeded for the year, the carryover catch does not trigger accountability measures (AM). Essentially, sectors that use carryover ACE in this scenario benefit from underutilization of other components of the fishery and are not subject to an AM.
- If the total fishery level ACL is exceeded, the amount of carried over catch that contributed to the overage will be subject to the repayment AM specified in regulation. Under this scenario, the repayment may not equal the amount of carryover used, dependent on if other fishery components fully utilized available catch limits. Only in a situation where all fishery components used 100% of their sub-ACLs would sectors repay the full amount of carryover used. By ensuring

accountability for any stock-level overage, this carryover approach would be consistent with National Standard 1 guidance.

7.1.2 Commercial and Recreational Fishery Measures

7.1.2.1 Small-Mesh Fishery Accountability Measures

7.1.2.1.1 Option 1: No Action

Impacts on regulated groundfish

This measure would not adopt a small-mesh fishery accountability measure for GB yellowtail flounder. Catches by these fisheries (longfin squid and whiting) have ranged from 24 mt to 110 mt during the period 2004 through 2012.Should the total ACL decline in future years, this catch could be a substantial portion of overall removals, and the lack of an AM to prevent the sub-ACL from being exceeded could lead to overfishing. Currently, groundfish fishing activity would be impacted by any overage of the GB yellowtail flounder sub-ACL for this fishery. When compared to Option 2, this measure would not result in any changes in fishing effort. As a result, when compared to Option 2, this option would have an increased risk of overfishing GB yellowtail flounder.

Impacts on other species

This option would have direct biological impacts on other species, specifically squid, whiting, and Atlantic sea scallops on Georges Bank. This option would be expected to lead to changes in catches of other species, and would affect the management of those species. Additional species that could be affected by this option would be species caught in small-mesh fisheries, principally squid and whiting and Atlantic sea scallops on Georges Bank. The GB yellowtail flounder sub-ACL for small-mesh fisheries would continue to not have an AM under this option. Although a pound for pound payback would remain in place due to the Understanding, fishing would continue on whiting and squid of Georges Bank if the sub-ACL was exceeded, zero, or not specified. The sub-ACL for GB yellowtail flounder can affect fishing mortality and stock size of species captured by the small-mesh fisheries (e.g., if by avoiding high bycatch rates of GB yellowtail flounder, the small-mesh fisheries reduce their target species catches).

The specified sub-ACL of GB yellowtail flounder for the sea scallop fishery are designed to limit the incidental catch of yellowtail flounder by the scallop fishery. For the scallop fishery, allocations that are exceeded result in triggering AMs in subsequent years. The sub-ACL for GB yellowtail flounder can affect fishing mortality and stock size of sea scallops and other species captured by scallop fishery.

7.1.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL

Two options (one with two sub-options) are being considered for the small-mesh fishery AM.

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

Impacts on regulated groundfish

This sub-option would prohibit fishing with small-mesh gear if the Georges Bank yellowtail flounder sub-ACL is zero or not specified. This would reduce fishing in this area under the AM and would decrease impacts on GB yellowtail flounder. Any unforeseen shift in fishing effort to areas outside the AM areas may increase fishing activity and impacts on other regulated groundfish species. Option 2/Sub-Option A could have positive impacts on GB yellowtail flounder compared to Option 1, making it less likely that overfishing would occur.

Impacts on other species

This measure could reduce catches of species caught on small-mesh trips, primarily squid and whiting. This is because if the AM is triggered because the sub-ACL is exceeded, it may restrict fishing activity on GB and lead to reduced catches of squid and whiting. When compared to Option 1/No Action, there is a chance this measure would lead to reduced fishing mortality on small-mesh species.

Sub-Option B1:

Impacts on regulated groundfish

This AM would only be triggered if both the total ACL and small-mesh sub-ACL of GB yellowtail flounder were exceeded. I the total ACL is not exceeded then no AM would be implemented and therefore no expected change in fishing pressure. If the AM was triggered, then the small-mesh vessels would be required to use modified gear in the GB yellowtail flounder stock area to reduce the catch of flounders in the AM areas. The gear restrictions under the AM would decrease impacts on GB yellowtail flounder. Any unforeseen shift in fishing effort to areas outside the GB yellowtail flounder stock area may increase fishing activity and impacts on other regulated groundfish species. Option 2/Sub-Option B1 could have positive impacts on GB yellowtail flounder compared to Option 1/No Action, and more positive benefits than Sub-Option A, making it less likely that overfishing would occur.

Impacts on other species

This measure could reduce catches of species caught on small-mesh trips, primarily squid and whiting. If the AM is triggered because the sub-ACL is exceeded, the required conservation gear may reduce the target catch (squid and whiting) efficiency compared to the standard gear. In addition, the AM may reduce fishing activity on GB if vessels do not own the approved selective gear, or chose not to fish with the required selective gear, which would also lead to reduced catches of squid and whiting. When compared to Option 1/No Action, there is a chance this measure would lead to reduced fishing mortality on small-mesh species. Option 2/Sub-Option B1 could have positive impacts other species compared to Option 1/No Action, and more positive benefits than Sub-Option A.

Sub-Option B2 (*Preferred Alternative*):

Impacts on regulated groundfish

The AM would be triggered if the small-mesh sub-ACL for GB yellowtail flounder was exceeded, regardless of whether the total ACL was exceeded or not. This option might be triggered sooner than the other options. If the AM was implemented then the small-mesh vessels would be required to use modified gear to reduce the catch of flounders in the AM areas. If the AM was implemented then the small-mesh vessels would be required to use modified gear to reduce the catch of flounders in the AM areas. The gear restrictions under the AM would be expected to decrease impacts on GB yellowtail flounder. Any unforeseen shift in fishing effort to areas outside the AM areas may increase fishing activity and impacts on other regulated groundfish species. Option 2/Sub-Option B2 could have positive impacts on GB yellowtail flounder compared to Option 1, but more positive benefits than Sub-Option A, making it less likely that overfishing would occur. This option is more conservative compared to Sub-Option B1, because it would be triggered even if the total ACL was not exceeded.

Impacts on other species

This measure could reduce catches of species caught on small-mesh trips, primarily squid and whiting. If the AM is triggered because the sub-ACL is exceeded, the required conservation gear may reduce the target catch (squid and whiting) efficiency compared to the standard gear. In addition, the AM may reduce fishing activity on GB if vessels do not own the approved selective gear or choose not to fish with the required selective gear, which would also lead to reduced catches of squid and whiting. When compared to Option 1/No Action, there is a chance this measure would lead to reduced fishing mortality on small-mesh species. Option 2/Sub-Option B2 could have positive impacts other species compared to Option 1/No Action, and more positive benefits than Sub-Option A and Sub-Option B1.

7.1.2.2 Management Measures for US/CA TACs

This section considers changing fishery management measures as necessary to adjust catches of US/CA stocks. More than one option can be selected.

7.1.2.2.1 Option 1: No Action

Impacts on regulated groundfish species

This option would not alter US/CA quotas in-season; this option is not expected to impact regulated groundfish species. Compared to Options 2 and 3, the No Action alternative would impact regulated groundfish species the least, since TACs of the US/CA stocks would not be increased.

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, since TACs of the US/CA stocks would not be increased.

7.1.2.2.2 Option 2: Revised in-season adjustment for US/CA TACs

Impacts on regulated groundfish species

This option allows the Regional Administrator to adjust the US/CA quotas during the fishing year that could result in an increase or decrease in the TACs for the US/CA stocks (EGB haddock, EGB cod, and GB yellowtail flounder). An in-season adjustment could shift (or increase) fishing effort from one target species to another and from one area to another, potentially increasing impacts on the US/CA stocks and stocks caught at the same time such as other regulated groundfish species. Option 2 has similar impacts on regulated groundfish species compared to Option 3 for both sub-options. When compared to the No Action alternative, it could have increased potential impacts on groundfish species.

Impacts on other species

This option would potentially lead to changes in catches of other species caught with US/CA stocks. When compared to the No Action alternative, it could have increased potential negative impacts on other species.

7.1.2.2.3 Option 3: Distribution of US TACs in Eastern/Western Georges Bank

Sub-Option A:

Impacts on regulated groundfish

This option would allow an adjustment to the EGB haddock quota prior to the start of the fishing year; the expected adjustment would be to reduce the EGB haddock quota and increase the WGB haddock quota. This alternative could increase fishing effort in the western area and increase impacts on WGB haddock but could result in a decrease in impacts of EGB haddock in the eastern area. Likewise, other groundfish species, caught on the same trips (e.g., Georges Bank cod) could have increased fishing effort. Option 3/Sub-Option A has similar impacts on regulated groundfish species compared to Option 2/Sub-Option B and Option 2. When compared to the No Action alternative, it could have increased potential impacts on Georges Bank haddock.

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.

Sub-Option B:

Impacts on regulated groundfish

This option allows sectors or state-operated permit banks, to harvest their EGB haddock quota in the WGB stock area at any time during the fishing year. It is unknown how much EGB quota will be harvested in the WGB area or whether this sub-option would result in more EGB quota being move than Sub-Option A. This alternative could increase fishing effort in the western area and increase impacts on WGB haddock but could result in a decrease in impacts of EGB haddock in the eastern area. Likewise, other groundfish species, caught on the same trips (e.g., Georges Bank cod) could have increased fishing effort. Option 5/Sub-Option B has similar impacts on regulated groundfish species compared to Option 3/Sub-Option A and Option 2. When compared to the No Action alternative, it could have increased potential impacts on Georges Bank haddock. While unknown, impacts are not likely to be significant because the overall ABC for GB haddock remains unchanged.

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.

7.1.2.3 Georges Bank Yellowtail Flounder Management Measures

7.1.2.3.1 Option 1: No Action

Impacts on regulated groundfish

This option would not modify the management measures for GB yellowtail flounder for estimating discards. This option would continue to use the entire stock area as the discard stratification scheme used for quota monitoring purposes. This level of area stratification is consistent with that used when assessing this stock, and so presumably it would result in a closer correspondence between in-season discard estimates and the discard estimates used in assessments regardless of how observer coverage is distributed in the area. If there are different discard rates in different areas, however, this approach may lead to increased uncertainty in discard estimates. The analyses summarized in Table 60 and Table 61 show that based on FY 2010 and FY 2011 data, the discard estimates from this option would not be expected to be very different than in Option 2. As discussed, however, the variance may increase.

Impacts on other species
There are not likely to be direct impacts on fishing mortality or stock size of other species as a result of the discard strata used if this option is adopted. The selection of discard strata used to monitor GB yellowtail flounder quotas will not modify the discard strata used to estimate discards of other species. There would not likely be differences between this option and Option 2.

7.1.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder

Impacts on regulated groundfish

This measure would modify the way discards are estimated for GB yellowtail flounder. Under Option 1 No Action, each discard stratum applies to the entire GB yellowtail flounder stock area. Discards of GB yellowtail flounder are calculated based on observed and unobserved trips in SAs 522, 525, 561, and 562. This option would divide this area into two separate discard strata: one stratum would be SA 522, and SAs 525/561/562 would be the other stratum.

In a qualitative sense, if there are differences in discard rates between the two strata, and observer coverage is adequate to sample trips from both strata, then stratification should provide more precise estimates of discards. Whether a different point estimate would result from the two stratification schemes depends in part on whether observer coverage with one stratum is distributed in a way that accurately represents fishing activity. If it does not, then stratification into two areas could result in a point estimate that is different from the single stratum approach. Recent assessments of GB yellowtail flounder use only one stratum, so it is possible that if quota monitoring uses a different stratification system the catch estimates for quota monitoring could differ from those used for assessing the stock. If the differences are large, then it will make it more difficult to link quota monitoring catches to mortality targets. If the quota-monitored catch is smaller than the assessment catch mortality targets may be exceeded. If the quota-monitored catch is larger than the assessment catch available yield may be foregone. The differences between the two catch estimates should only apply to discard estimates and not to landings. Large mesh otter trawl discards of GB yellowtail flounder declined dramatically after the implementation of sectors. In 2011, they accounted for less than five percent of the total catch. Assuming these discards remain a small proportion of the total catch, differences in discard estimates between the two stratification approaches are not likely large enough to threaten mortality targets.

Data from fishing years 2010 and 2011 was used to explore how the two proposed discard strata might affect discard estimates used in monitoring sector catches. To simplify the analyses, discards were calculated using the approach used for in-season rates; none of the estimates used the assumed rate or transition rate approach that is used until five trips are observed in a stratum. Since almost all GB yellowtail flounder is caught by trawl gear, only trips using otter trawls (code 050), separator trawls (code 057), or Ruhle trawls (code 054) were used. There are several instances where there were no observed trips in a sector/gear combination and there were unobserved trips, or the opposite; these instances were not included in the analysis. The analyses summarized observed trips and discard rates by sector and gear, and then expanded the discard rates to total discards on unobserved trips by using the total kept catch on unobserved trips. Discards on observed trips were added to get total discards in each gear and sector combination.

The results for FY 2010 are shown in Table 60 and for FY 2011 in Table 61. Generally, for both years the sector/gear discard rate in SA 525/561/562 was higher than the discard rate in SA 522, though there are a few exceptions. The discard rate in SA 525/561/562 was higher than the discard rate for all four areas in all but three instances, and in each of these three instances there were small numbers of trips. Stratification resulted in relatively small changes in the point estimate of discards. In FY 2010, the total discards estimated for these trips was five percent higher when the Option 2 approach was used, while in FY 2011 the difference was less than one percent. The effect on the variance of the discard estimates was not calculated, but it should be noted that for several sectors stratification into two areas reduces the number of observed trips to low levels which would be expected to increase the variance in those estimates. Lower observer coverage levels and an additional area stratification could result in some sector/gear/area combinations with very high or low discard rates just from chance alone. Estimates based on a finer scale of stratification will be more sensitive to errors in the expansion factor (the unobserved kept–all estimate). Many VTR records attribute all landings to one statistical area even when multiple areas were fished; this could lead to more errors in the kept-all that is used to expand discard rates to an estimate of discards if a discard stratum is small or based on one statistical area.

In summary, based on fishing activity in FY 2010 and FY 2011, changing the stratification of quota-monitoring discard estimates as proposed in this option is not likely to lead to large changes in the point estimate of discards when compared to the stratification method used in Option 1 No Action. As a result this option would be unlikely to result in biological impacts that are any different than those in Option 1 No Action. It is possible that Option 2 may result in increased variance in discard estimates as some sector/gear combinations could have few observed trips in each stratum. Based on FY 2010 and 2011, this appears likely since a number of sector/gear /area combination has fewer than five observed trips. It is also possible that if observer coverage rates decline, the variance of discard estimates could increase because more sector/gear/area combinations will have fewer trips. This option cannot be compared to Option 3 because the two measures address different issues.

Impacts on other species

This option would not have any biological impacts on other species. The proposed change to the discard strata would only be used for catches of GB yellowtail flounder and not for other species. As a result, this measure would not change the way discards of other species are calculated. The biological impacts on other species would not be any different than those expected under Option 1 No Action.

Table 60- Observed trips and expanded discards using different GB yellowtail flounder stratification schemes, FY 2010. "Other" bold-faced discard rates are higher than those in SA 522; underlined values are higher than the rates for the entire area.

2010		Observed Trips						Expanded Discards			
		GB Area		522		Other					
Sector ID	Gear	SubTrips	d:K	SubTrips	d:K	SubTrips	d:K	GB	522	Other	(522+Other)
002	050	4	0.084631	2	0.003465	2	***0.098145***	27,498	202	26,077	26,279
005	050	66	0.001679	43	0.001237	23	***0.00212***	5,993	1,877	4,354	6,231
	054	8	0.000605	2	0.000747	6	0.0006	163	39	131	170
	057	68	0.002507	25	0.00243	43	***0.00252***	10,537	1,107	9,441	10,548
007	050	55	0.003898	34	0.001783	21	***0.007747***	9,342	2,477	7,656	10,133
	054	2	0.000974	1	0	1	***0.000988***	9	0	9	9
	057	17	0.004366	7	0.000872	10	***0.006337***	1,298	65	1,397	1,463
009	050	46	0.005128	21	0.002396	25	***0.007148***	14,829	3,283	10,705	13,988
	054	3	0.000128	2	0	1	***0.000129***	1	0	1	1
	057	15	0.021771	7	0.011251	8	***0.031677***	4,469	640	4,786	5,426
012	050	35	0.002082	20	0.001795	15	***0.002374***	3,729	1,155	2,721	3,876
	057	26	0.006762	11	0.001599	15	***0.007824***	6,087	209	6,113	6,322
016	050	51	0.004653	26	0.002122	25	***0.006177***	12,727	1,947	11,190	13,137
	054	25	0.001602	11	0.000452	14	***0.002505***	811	79	893	972
	057	8	0.011684	3	0.000752	5	***0.012846***	1,157	7	1,150	1,157
017	050	95	0.010453	53	0.00295	42	***0.018264***	58,564	7,049	58,322	65,371
	054	1	0.001237			1	***0.001237***	55	0	55	55
	057	16	0.009919	7	0.000195	9	***0.01137***	1,568	4	1,609	1,613
018	050	17	0.008556	7	0.004379	10	***0.009906***	8,004	882	7,270	8,152
019	050	11	0.008052	4	0.000822	7	***0.009357***	4,866	91	4,618	4,708
020	050	3	0.00039	2	0.000391	1	0	98	66	0	66
	057	4	0.017352	1	0.023438	3	0.017299	2,047	12	2,029	2,042
								173,855	21,189	160,530	181,719

Table 61- Observed trips and expanded discards using different GB yellowtail flounder stratification schemes, FY 2011. "Other" bold-faced discard rates are higher than those in SA 522; underlined values are higher than the rates for the entire area.

		Observed Trips						**Expanded Discards**			
		GB Area		522		Other					
Sector	Gear	Sub Trips	d:K	Sub Trips	d:K	SubTrips	d:K	GB	522	Other	(522+Other)
005	050	100	0.000878	66	0.000918	34	0.000816	3,658	2,018	1,604	3,622
	054	2	0			2	0	0	0	0	0
	057	55	0.002542	20	0.000408	35	***0.003048***	5,827	101	6,311	6,411
007	050	45	0.003	28	0.001599	17	***0.006827***	5,946	2,223	3,978	6,201
	057	6	0.003444	2	0	4	***0.003711***	3,135	0	3,148	3,148
009	050	48	0.007793	26	0.002939	22	***0.012107***	18,034	3,634	12,867	16,501
	057	10	0.001279	5	0.00107	5	***0.001364***	140	29	111	140
012	050	40	0.002714	26	0.000415	14	***0.006013***	3,832	293	4,427	4,720
	057	12	0.00154	6	0	6	***0.001962***	355	0	308	308
								0	0	0	0
016	050	68	0.004404	34	0.000974	34	***0.008926***	12,448	1,423	12,024	13,446
								0	0	0	0
	054	10	0.000401	1	0	9	***0.000409***	81	0	81	81
017	050	160	0.006421	90	0.003126	70	***0.009634***	49,351	12,336	35,642	47,978
	057	10	0.002581	5	0	5	***0.003888***	678	0	712	712
018	050	6	0.005114	3	0.002983	3	***0.006598***	1,628	346	1,367	1,713
019	050	5	0.002488	2	0.001469	3	***0.003045***	1,086	84	1,148	1,232
020	050	5	0.000683	3	0	2	***0.002038***	248	0	138	138
								106,446	22,486	83,865	106,352

7.1.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

7.1.2.4.1 Option 1: No Action

Impacts on regulated groundfish

This option would maintain the requirement for limited access scallop vessels to land all legal-sized yellowtail flounder. The No Action alternative is not expected to change fishing activities by scallop vessels and would not impact GB and SNEMA yellowtail flounder species. In addition due to concerns about discarding of yellowtail flounder, this option would maintain accountability for catches of this stock. However if vessels choose to take advantage of this regulation and target yellowtail flounder then when compared to Option 2 yellowtail flounder catches could increase. Option 1 could have slightly more negative impacts on GB and SNEMA yellowtail flounder than Option 2 if LA scallop vessels target yellowtail flounder.

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.

7.1.2.4.2 Option 2: Prohibition on possession of yellowtail flounder

Impacts on regulated groundfish

This option would prohibit possession of GB and SNEMA yellowtail flounder stocks by limited access scallop vessels, i.e. they would be required to discard all yellowtail flounder. This measure is expected to eliminate any potential targeting of YT flounder by scallop vessels, which could have negative impacts on groundfish species. Therefore, prohibiting possession may have positive impacts on groundfish species if it eliminates the incentive for scallop vessels to target yellowtail flounder. This measure does not affect the level of effort in the scallop fishery. Scallop vessels will likely maintain the same fishing patterns under this option, and discard any YT flounder as bycatch. As analyses show in this document, the majority of yellowtail flounder caught in this fishery is discarded. Compared to Option 1 this option has potentially more positive impacts on groundfish species if it helps to eliminate targeting of yellowtail flounder by scallop vessels.

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.

7.2 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 TACs 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 Surf clam 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 is not expected to have significant additional adverse impact on EFH relative to No Action. Furthermore, the Preferred Alternatives do not allow for access to the existing habitat closed areas on GB and in the GOM that were implemented in Amendment 13 to the Multispecies FMP and therefore they continue to minimize the adverse impacts of bottom trawling on EFH.

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

7.2.1.1 Revised Gulf of Maine Cod Rebuilding Strategy

7.2.1.1.1 Option 1: No Action

This option would maintain the current rebuilding strategy which has a target end date of 2014. Projections indicate that rebuilding will not occur within this timeframe. If this option was adopted, fishing mortality would be set as close to zero as possible in 2015. This may reduce groundfish fishing activity in the GOM area compared to Option 2. Thus, No Action would be expected to reduce fishery impacts on EFH.

7.2.1.1.2 Option 2: Revised Rebuilding Strategy for Gulf of Maine Cod

Two options are being considered for a revised rebuilding strategy for GOM cod. Overall, when compared with the No Action alternative, Option 2 would result in more fishing activity targeting GOM cod because the fishing mortality would be set higher than 75% FMSY.

Sub-Option A would revise the rebuilding strategy to a target date of 2022 with a median probability of success, while Sub-Option B would revise the rebuilding strategy to a target date of 2024 with a median probability of success.

Either approach would allow for a slightly higher fishing mortality rate, which would probably lead to increased fishing effort and therefore increased impacts to EFH in the GOM when compared to the No Action alternative. However, fishing effort will be limited by ACLs for associated species, such as GOM haddock, which has a lower ACL compared to GOM cod. Thus, it is difficult to estimate how much a change in the rebuilding plan would contribute to increased fishing effort in the GOM. Overall, the impacts of Option 2 on EFH are probably slightly negative to neutral relative to Option 1, No Action.

7.2.1.1.3 Option 3: Rebuilding Plan Review Analysis

If selected, Option 3 would be implemented in conjunction with Option 2. It would require an analysis of the rebuilding plan using the described criteria. This administrative alternative is not expected to impact EFH directly.

7.2.1.2 Revised American Plaice Rebuilding Strategy

7.2.1.2.1 Option 1: No Action

This option would maintain the current rebuilding strategy which has a target end date of 2014. Projections indicate that rebuilding will not occur within this timeframe. If this option is adopted, fishing mortality would be set as close to zero as possible in 2015. This may reduce groundfish fishing activity in the American plaice stock area (GOM and GB) compared to Option 2.

7.2.1.2.2 Option 2: Revised Rebuilding Strategy for American Plaice

Three options are being considered for a revised rebuilding strategy for American plaice. Overall, when compared with the No Action alternative, Option 2 would result in more fishing activity targeting American plaice because the fishing mortality would be set higher than 75% FMSY.

Sub-Option A would revise the rebuilding strategy to a target date of 2021 with a median probability of success. Sub-Option B would revise the rebuilding strategy to a target date of 2022 with a median probability of success. Sub-Option C would revise the rebuilding strategy to a target date of 2024 with a median probability of success.

All three approaches would allow for a slightly higher fishing mortality rate, which would probably lead to increased fishing effort and therefore increased impacts to EFH in the American plaice stock area (GOM and GB) when compared to the No Action alternative. However, fishing effort will be limited by ACLs for associated species, such as witch flounder. Thus, it is difficult to estimate how much a change in the rebuilding plan would indirectly contribute to increased fishing effort in the American plaice stock area (GOM and GB). Overall, the impacts of Option 2 on EFH are probably slightly negative to neutral relative to Option 1, No Action.

7.2.1.2.3 Option 3: Rebuilding Plan Review Analysis

If selected, Option 3 would be implemented in conjunction with Option 2. It would require an analysis of the rebuilding plan using the described criteria. This administrative alternative is not expected to impact EFH directly.

7.2.1.3 Annual Catch Limits

7.2.1.3.1 Option 1: No Action

Under No Action, stocks with FY 2014 specifications from previous actions would be maintained at that level. However, GB yellowtail flounder and white hake do not have FY 2014 specifications defined in previous actions. This option would not set specifications for these stocks in FY 2014. Without specification of an ACL, 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, and the only area that most groundfish fishing activity could occur is the SNE area. 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 in the GB and GOM regions as compared to the alternative specifications (Option 2).

7.2.1.3.2 Option 2: Revised Annual Catch Limit Specifications

Option 2 would adopt new ABCs consistent with the best available science for GB yellowtail flounder (FY 2014), GB haddock (FY 2014), GB cod (FY 2014) and white hake (FY 2014-2016) as shown in Table 4. The ABCs for other stocks were set in previous actions. The ACLs and sub-ACLs, where specified, follow directly from the ABC levels.

One way to consider these ABCs and ACLs is in comparison with status quo catch limits. The white hake ABCs are similar for FY 2014, 2015, and 2016 (4,642, 4,713, and 4,645 mt, respectively), and represent a slight increase as compared to the 2013 ABC of 4,177 mt. However, in FY2012, less than 70% of the white hake ACL was caught by the groundfish fleet (Table 33), so the ACL changes alone are not likely to result in increased fishing effort and increased impacts to EFH. Thus, the white hake specifications are expected to have neutral impacts relative to current conditions. It is difficult to predict how fishing effort may change in later years of the specifications, i.e. fishing years 2015 and 2016, because ACLs for some key stocks (GB cod, haddock, and yellowtail) have not yet been determined.

The GB yellowtail flounder, eastern GB cod, and eastern GB haddock U.S. TACs/ABCs would increase during FY 2014, which may increase fishing effort and therefore impacts to EFH on GB relative to current conditions:

GB yellowtail flounder: 215 mt in FY 2013 to 328 mt in FY 2014
E. GB cod: 96 mt in FY 2013 to 154 mt in FY 2014
E GB haddock: 3,952 mt in FY 2013 to 10,530 mt in FY 2014

While the groundfish fleet caught only 58.5% of their yellowtail ACL in 2012 (Table 33), the GB yellowtail flounder ACL is generally smaller and probably more of a constraint on effort in the fishery as compared to the white hake limit, so increased effort and impacts to EFH are a likely response to the increased ABC and ACL for GB yellowtail flounder. A smaller percentage of the GB cod ACL was caught in FY 2012, 26.9%, but this stock is also likely to constrain effort in the fishery. The GB haddock catch limits do not constrain the fishery as they are very large relative to other catch limits. It is difficult to assess where on GB effort increases may occur as stocks like GB cod and yellowtail may be taken incidentally while targeting more abundant species such as haddock and winter flounder. Fishing on structurally complex, lower energy areas along the northern edge of the bank will have a greater impact on seabed habitats as compared to fishing on lower vulnerability, high energy sand habitats on the southeastern part of the bank.

Another way to consider the impacts of these ABCs and ACLs is relative to the No Action option. Option 2 would have a negative impact on EFH compared to No Action, which sets no ABC/ACL for four stocks: GB cod, GB haddock, GB yellowtail flounder, or white hake. The No Action option is expected to reduce fishing effort on Georges Bank significantly, such that impacts of the groundfish fishery on EFH would be reduced. Thus, Option 2 has negative impacts for EFH as compared to Option 1, No Action.

7.2.2 Commercial and Recreational Fishery Measures

7.2.2.1 Small-Mesh Fishery Accountability Measures

7.2.2.1.1 Option 1: No Action

FW48 established a sub-ACL for GB yellowtail flounder for the small mesh fishery. This option would continue current management where there is no AM for the small-mesh fishery for GB yellowtail flounder. Fishing effort would not be modified if the sub-ACL is exceeded, for example through gear restricted areas or a reduction in the sub-ACL the following year. GB yellowtail flounder is a TMGC stock; if the US exceeds its negotiated TAC there is a pound for pound payback under the U.S./Canada Resource Sharing Understanding. The small-mesh fishery is prohibited from landing GB yellowtail flounder; the pound for pound payback may not correct an overage thus fishing effort may remain at current levels under the No Action alternative and would not be expected to result in changes to impacts on EFH. The No Action alternative does not have the expected positive benefit like Option 2.

7.2.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL

Two options are being considered for the small-mesh fishery AM. Overall, Option 2 would have positive impacts on EFH when compared to the No Action alternative, as discussed in each section below.

Sub-Option A:

If adopted, this sub-option prevents fishing in the GB yellowtail flounder stock area if the sub-ACL for the small-mesh fishery was zero. A zero sub-ACL would result from repayment of pound for pound overages under the US-Canada Sharing Agreement. This AM option would reduce fishing effort on Georges Bank, for example whiting fishing in the Cultivator Shoal Area and squid/mackerel/butterfish trawling along the southern flank of Georges Bank, which would be a positive impact in those areas. It is unclear if this would shift effort to other areas, which would negatively impact EFH in those areas. Compared to the No Action alternative, Sub-option A has fewer impacts on EFH as it restricts trawl gear effort on GB. It is difficult to compare Sub-Option A to Sub-Option B because Sub-Option A is a reduction in effort overall and Sub-Option B is a gear change. Both are expected to have positive impacts on EFH but would do so via different mechanisms.

Sub-Option B1:

If adopted, this sub-option would establish an AM that would require the use of approved selective trawl gear designed to reduce the catch of yellowtail flounder if the AM is triggered. The selective gear would need to use either a raised footrope or a chain sweep, as approved by NMFS. The AM is only triggered if the total ACL and small-mesh sub-ACL for GB yellowtail flounder are exceeded; this is less conservative than sub-option B2. Switching to a different type of trawl gear could reduce seabed impacts. In particular, along the footrope, the contact of a raised footrope trawl with the seabed is likely very low (estimated at 5% for the Swept Area Seabed Impact model, NEFMC 2011). Trawls used in the squid fishery are also relatively low contact along the sweep; estimated at about 50% (NEFMC 2011). Thus, if the AM is triggered, a shift from gear that uses cookie or roller sweeps to gear that uses a raised footrope or chain sweeps is expected to reduce impacts to EFH. This assumes that gear efficiency is maintained such that overall bottom fishing time does not increase. It is difficult to compare Sub-Option A to Sub-Option B because Sub-Option A is a reduction in effort overall and Sub-Option B is a gear change. Both are expected to have positive impacts on EFH but would do so via different mechanisms.

Sub-Option B2:

If adopted, this sub-option would establish an AM that would require the use of approved selective trawl gear designed to reduce the catch of yellowtail flounder if the AM is triggered. The AM is triggered if the total ACL for GB yellowtail flounder is exceeded; this is more conservative than sub-option B1. As above, switching to a different type of trawl gear is likely to reduce seabed impacts. It is difficult to compare Sub-Option A to Sub-Option B because Sub-Option A is a reduction in effort overall and Sub-Option B is a gear change. Both are expected to have positive impacts on EFH but would do so via different mechanisms.

7.2.2.2 Management Measures for US/CA TACs

This section considers changing fishery management measures as necessary to adjust catches of US/CA stocks. More than one option can be selected. It is difficult to rank the various options in terms of their potential impacts. The US/CA stocks include GB cod, GB haddock, and GB yellowtail flounder.

7.2.2.2.1 Option 1: No Action

This option would not alter how the US/CA TACs are administered. Any impacts to EFH would be dependent on the magnitude of the TACs negotiated according to the current process. These TACs are unknown for FY beyond 2014. The impacts of the FY 2014 TACs and their associated ABCs/ACLs are discussed in a previous section. It is reasonable to assume that trades contemplated under Option 2 would have a good chance of increasing fishing effort and therefore EFH impacts in US waters, otherwise such trades would not be suggested. However, it is not certain that a mutually beneficial exchange could be arrived at in any given year. Therefore, fishing effort on Georges Bank would probably remain the same or be less under No Action US/CA TAC administration as compared to a scenario where US/CA TACs could be adjusted in season. It is difficult to estimate what the actual impacts might be without knowing the magnitude of catch shifts that might occur. If increases in the TAC were to occur, there may be more bottom contact; bottom contact would be reduced if the TAC was decreased. However, habitat in these areas has already been degraded by fishing gear.

7.2.2.2.2 Option 2: Revised in-season adjustment for US/CA TACs

This option would authorize the Regional Administrator to adjust the US/CA quotas after the initial negotiations. Additional quota would be allocated consistent with the current ABC distribution, which would include both groundfish and non-groundfish vessels. The trade would be dependent on the current needs of fisheries in each country and the resource allocation distribution, both of which cannot be predicted. Any shifts in fishing effort given the updated allocations would occur within the GB stock area. EFH impacts would vary depending on the magnitude of quota received by the various fisheries (and gear types) harvesting the quota. Because these values are unknown, the impacts to EFH are unknown.

7.2.2.2.3 Option 3: Distribution of US TACs in Eastern/Western Georges Bank

Sub-Option A:

If this sub-option was adopted, the Regional Administrator would be authorized to adjust the portion of U.S. TAC for EGB haddock that is available in the EGB stock area. GB haddock is assessed as a unit stock, and the EGB and WGB stock areas are administrative. Under the current approach, only the amount of the GB haddock ABC remaining after deducting the shared TAC for Eastern GB haddock is available to be caught outside of the Eastern U.S./Canada Area. This reduces operational flexibility for commercial groundfish vessels, and could potentially limit fishing outside of the Eastern U.S./Canada Area even if the total GB haddock ACL has not been fully caught. This measure would help increase the use of the GB haddock ACL, improve flexibility for commercial groundfish vessel, and could increase fishing effort overall. Thus, compared to the No Action alternative and Options 2, and Option 5 Sub-Option A would have negative impacts on EFH if the quota transfer leads to an increase in fishing effort overall. The increases would occur outside the Eastern U.S./Canada area.

Sub-Option B:
If this sub-option was adopted, sectors would be authorized to transfer a portion (or all) of their U.S. TAC for EGB haddock to the WGB stock area. As above, compared to the No Action alternative and Options 2, and Option 5 Sub-Option B would have negative impacts on EFH if the quota transfer leads to an increase in fishing effort overall. The increases would occur outside the Eastern U.S./Canada area.

7.2.2.3 Georges Bank Yellowtail Flounder Management Measures

7.2.2.3.1 Option 1: No Action

This option would not change management measures for GB yellowtail flounder, specifically there would be no stratification of discard estimates by any elements besides sector, gear, and mesh, and also no gear modification requirements imposed on small-mesh trawling activities (this mainly applies to the squid and whiting fisheries). This measure would not be expected to have any direct impacts on EFH. It could, however, indirectly lead to shifts in the distribution of fishing effort when compared to Option 2. Because of the expected low ABC for GB yellowtail flounder in the short term, if discard estimates are not stratified as proposed in Option 2, it is possible that fishermen may more rapidly catch their sector's allocation for this stock. This would prevent them from fishing on most of GB. While if this occurs it may reduce impacts to EFH when compared to Option 2, it is difficult to predict with certainty if this would actually occur. It is possible fishermen would modify fishing practices to reduce catches of yellowtail flounder in order to avoid exceeding their ACE and continue fishing in the area.

7.2.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder

This option would impose additional stratification criteria for the purpose of estimating in-season progress towards catching the GB yellowtail flounder quota. Specifically, Statistical Area 522 catches would be separated out from catches from Statistical Areas 561,562, and 525. Because catch rates of GB yellowtail flounder in the deeper portions of Statistical Area 522 tend to be lower than in the other statistical areas, this stratification would likely allow trawl vessels targeting other species, particularly haddock, to fish more in this area without exceeding GB yellowtail flounder allocations. Assuming that fishing effort on Georges Bank would be limited by yellowtail flounder catch limits, this stratification could lead to additional fishing activity in Area 522 and elsewhere on Georges Bank where haddock occur when compared to Option 1. This increased effort could increase seabed impacts, but catches would also be expected to more closely approach targets for stocks such as GB haddock. With the exception of the cobble-dominated habitats east and west of Georges Shoal in the eastern part of SA 522, the portion of SA 522 that is on the bank itself is generally relatively sandy and low energy, and therefore the habitat is less vulnerable as compared to habitats in SA 561. In this way, shifting effort from the western part of SA 561 into SA 522 could neutralize any negative impacts of increased fishing effort.

7.2.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

7.2.2.4.1 Option A: No Action

Under No Action, limited access scallop vessels are required to land all legal-sized yellowtail flounder caught in the GB and SNEMA stock areas. While the measure is intended in part to obtain additional data about the distribution of yellowtail flounder catches in the scallop fishery, it may be creating an incentive for some vessel operators to target yellowtail. Generally speaking, yellowtail flounder catches are a limiting factor in the distribution of scallop fishing effort, and many vessel operators try to avoid catching the species.

Regardless of whether yellowtail must be landed, the fishery is still limited to an overall sub-ACL for each yellowtail flounder stock, so this measure is probably not the main determinant of the amount and distribution of effort in the scallop fishery, and therefore on scallop fishery impacts to EFH. Based on scallop PDT analyses (see biological impacts section) compliance with this provision seems to be fairly low, i.e. most yellowtail are already discarded, at least during observed trips.

However, if yellowtail flounder are being targeted during additional tows that are not targeting scallops, then this measure could be causing additional fishing time in the scallop fishery and therefore increased impacts to EFH. This is more likely to occur on access area trips as compared to DAS trips, as scallop vessels would be expected to focus on catching more valuable scallops when they are time-limited on a DAS. If the landed yellowtail are truly incidental catch and are not being deliberately targeted, then the patterns of fishing effort and therefore impacts to EFH would not be expected to change very much if possession is prohibited. Overall, Option A likely has a small negative impact on EFH.

7.2.2.4.2 Option B: Prohibition on possession of yellowtail flounder

If this option is adopted, limited access scallop vessels would be prohibited from landing yellowtail flounder caught in the GB and SNEMA stock areas. This would reduce the incentive to target yellowtail flounder. Removing this incentive may lead to changes in fishing location and therefore the distribution of EFH impacts, or it could simply affect the rate of discards in the fishery. The prohibition would be expected to eliminate scallop fishery effort targeting yellowtail, and thus could reduce effort overall. However, if the majority of yellowtail catch is already incidental catch, then a prohibition on possession is not expected to have much influence on the patterns of fishing effort and therefore impacts to EFH in the scallop fishery. Overall, Option B likely has a small positive impact on EFH.

7.3 Impacts on Endangered and Other Protected Species

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

7.3.1.1 Revised Gulf of Maine Cod Rebuilding Strategy

7.3.1.1.1 Option 1: No Action

This option would result in no revision to the rebuilding strategy for Gulf of Maine cod. Fishing mortality (set at 75% F_{MSY}) would be maintained. The stock is unlikely to rebuild by 2014; this option does not alter fishing mortality and is not expected to greatly impact protected species. Compared to Options 2 and 3, this option would have low negative impacts on protected species.

7.3.1.1.2 Option 2: Revised Rebuilding Strategy for Gulf of Maine Cod

This option contains two sub-options that would allow the stock to rebuild by 2022 or 2024. The two sub-options allow for an increase in catch, which may increase interactions with protected resources when compared to the No Action alternative.

<u>Sub-Option A</u>: This strategy would rebuild the stock in 8 years with a 50% probability of success. The 8 year scenario is very similar to that of 75% F_{MSY}. The 8 year rebuilding plan is expected to allow a small increase in catch, which may impact protected species in areas where fishing for Gulf of Maine cod occurs. Compared to the No Action alternative and Option 3, this alternative is expected to adversely affect, but not jeopardize protected species in areas where fishing for Gulf of Maine cod occurs because of the slight increase in F allowed. The difference in F between Sub-Options A and B is small and may be difficult to detect; Sub-Option A would have similar impacts on protected resources as Sub-Option B during the length of the rebuilding plan.

<u>Sub-Option B</u>: This strategy would rebuild the stock in 10 years with a 50% probability of success. The resulting F for the 10 year scenario is higher than that of 75%F_{MSY} based on projections. The 10 year rebuilding plan is expected to allow an increase in catch, which may impact protected species in areas where fishing for Gulf of Maine cod occurs. Compared to the No Action alternative, this alternative is expected to adversely affect, but not jeopardize protected species in areas where fishing for Gulf of Maine cod occurs because of the slight increase in F allowed. The difference in F between Sub-Options A and B is small and may be difficult to detect; Sub-Option B would have similar impacts on protected resources as Sub-Option A during the length of the rebuilding plan.

7.3.1.1.3 Option 3: Rebuilding Plan Review Analysis

Option 3 would require an analysis of the rebuilding plan using the described criteria. This is an administrative alternative and is not expected to impact protected species.

7.3.1.2 Revised American Plaice Rebuilding Strategy

7.3.1.2.1 Option 1: No Action

This option would result in no revision to the rebuilding strategy for American plaice. Fishing mortality (set at 75% F_{MSY}) would be maintained. The stock is unlikely to rebuild by 2014, however, this option does not alter fishing mortality and is not expected to greatly impact protected species. Compared to Options 2 and 3, this option would have low impacts on protected species.

7.3.1.2.2 Option 2: Revised Rebuilding Strategy for American Plaice

This option contains three sub-options that would allow the stock to rebuild by 2021, 2022 or 2024. The three sub-options allow for an increase in catch, which may increase interactions with protected resources when compared to the No Action alternative.

Sub-Option A: This strategy would rebuild the stock in 7 years with a 50% probability of success. The resulting F for the 7 year scenario is higher than that of 75%F_{MSY} based on projections. This is expected to allow a small increase in catch, which may impact protected species in areas where fishing for American plaice occurs. Compared to the No Action alternative and Option 3, this alternative is expected to adversely affect, but not jeopardize protected species in areas where fishing for American plaice occurs because of the slight increase in F allowed. The difference in F between Sub-Options A, B and C is small and may be difficult to detect; Sub-Option A would have similar impacts on protected resources as Sub-Options B and C during the length of the rebuilding plan.

Sub-Option B: This strategy would rebuild the stock in 8 years with a 50% probability of success. The resulting F for the 8 year scenario is higher than that of 75%F_{MSY} based on projections. This is expected to allow a small increase in catch, which may impact protected species in areas where fishing for American plaice occurs. Compared to the No Action alternative and Option 3, this alternative is expected to adversely affect, but not jeopardize protected species in areas where fishing for American plaice occurs because of the slight increase in F allowed. The difference in F between Sub-Options A, B and C is small and may be difficult to detect; Sub-Option B would have similar impacts on protected resources as Sub-Options A and C during the length of the rebuilding plan.

Sub-Option C: This strategy would rebuild the stock in 10 years with a 50% probability of success. The resulting F for the 10 year scenario is higher than that of 75%F_{MSY} based on projections. This is expected to allow a small increase in catch, which may impact protected species in areas where fishing for American plaice occurs. Compared to the No Action alternative and Option 3, this alternative is expected to adversely affect, but not jeopardize protected species in areas where fishing for American plaice occurs because of the slight increase in F allowed. The difference in F between Sub-Options A, B and C is small and may be difficult to detect; Sub-Option C would have similar impacts on protected resources as Sub-Options A and B during the length of the rebuilding plan.

7.3.1.2.3 Option 3: Rebuilding Plan Review Analysis

Option 3 would require an analysis of the rebuilding plan using the described criteria. This is an administrative alternative and is not expected to impact protected species. Compared to the No Action alternative and Option 2, this alternative would not impact protected species.

7.3.1.3 Annual Catch Limits

7.3.1.3.1 Option 1: No Action

For white hake and the US/CA stocks, there would be no groundfish sub-ACL under this option. This would reduce interactions with protected species as fishing activity would be expected to decrease in areas where these species are caught. If compared to groundfish sub-ACLs set for white hake and the US/CA stocks in FW50, the No Action alternative represents a reduction in the sub-ACLs, which would have positive impacts on protected species. Option 1 may have more positive impacts on protected species than Option 2.

7.3.1.3.2 Option 2: Revised Annual Catch Limit Specifications

This option proposes to adopt new specifications and ACLs for FY 2014 -2015 for GB cod, GB haddock, GB yellowtail flounder, and white hake. This measure includes the identification of ACLs, OFLs, and ABCs 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.

As was mentioned in the analysis of the previous options, the greater the fishing effort, the more possibility that interactions with protected species may occur. For the US/Canada stocks, the U.S. TAC for GB cod, GB haddock and GB yellowtail flounder all increase. This could lead to a shift in effort to the eastern area for GB cod and haddock. The quantitative consequences of these changes are unknown, but could be positive if effort is reduced in seasonal high use areas and the reduction overlaps with the distribution of protected resources.

Option 2 would increase the white hake ABC. The increased amount is not expected to cause large changes to fishing behavior and is also not expected to increase impacts on protected species. The combination of the changes in ABCs may result in some shifts in fishing area but the overall impact is not expected to be great. The No Action alternative would be expected to have a lower impact on protected species, as it would result in reduced fishing activity. Option 2 would have more negative impacts on protected species than Option 1.

It is important to note that all of the options which could cause increases or decreases in interactions with the fishery the overall impact to protected species are likely to be negligible, and the impacts are uncertain as quantitative analysis has not been performed. Catches in the fishery will still be constrained by other limitations placed on the fishery, such as those relating to the catch of other co-managed species and bycatch, thereby mitigating the impacts of the potential changes.

7.3.2 Commercial and Recreational Fishery Measures

7.3.2.1 Small-Mesh Fishery Accountability Measures

7.3.2.1.1 Option 1: No Action

If this option is adopted, an accountability measure for the small-mesh fishery would not be established. Fishing activity would not be impacted by any overage of the GB yellowtail flounder sub-ACL for this fishery, which would not alter the expected level of interactions with protected species. When compared to Option 2, this measure would not result in any changes in fishing effort and would not be expected to have any differential impacts on protected species.

7.3.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder sub-ACL

This option would establish an accountability measure that would impact fishing activity if the Georges Bank yellowtail flounder sub-ACL was exceeded by the small-mesh fishery. This option may provide an incentive to decrease yellowtail flounder bycatch, e.g. by using modified gear, however, a reduction in yellowtail bycatch may not reduce interactions with protected resources unless the modified gear is shown to decrease interactions with protected resources or fishing effort is reduced.

Sub-Option A: This sub-option would prohibit fishing with small-mesh gear, if the sub-ACL is zero, or if there was no sub-ACL specified for the Georges Bank yellowtail flounder stock area. This would reduce fishing in this area under the AM and would decrease impacts on protected resources. Any unforeseen shift in fishing effort to areas outside the AM areas may increase fishing activity and impacts on protected species. Option 2 could have positive impacts on protected species compared to Option 1.

Sub-Option B1: This AM would only be triggered if both the total ACL and small-mesh sub-ACL of GB yellowtail flounder were exceeded. If the AM was implemented, then the small-mesh vessels would be required to use modified gear to reduce the catch of flounders in the AM areas. Any unforeseen shift in fishing effort to areas outside the AM areas may increase fishing activity and impacts on protected species. Option 2 could have positive impacts on protected species compared to Option 1.

Sub-Option B2: The AM would be triggered if only the small-mesh sub-ACL for GB yellowtail flounder was exceeded. This option might be triggered sooner than the other options. If the AM was implemented then the small-mesh vessels would be required to use modified gear to reduce the catch of flounders in the AM areas. Any unforeseen shift in fishing effort to areas outside the AM areas may increase fishing activity and impacts on protected species. Option 2 could have positive impacts on protected species compared to Option 1

7.3.2.2 Management Measures for US/CA TACs

7.3.2.2.1 Option 1: No Action

This option would not alter US/CA quotas in-season; this option is not expected to impact protected species. Compared to Options 2, 3, 4 and 5, the No Action alternative would impact protected species the least.

7.3.2.2.2 Option 2: Revised In-Season Adjustment for US/CA TACs

This option allows the Regional Administrator to adjust the US/CA quotas during the fishing year that could result in an increase or decrease in the TACs for the US/CA stocks. An in-season adjustment could shift (or increase) fishing effort from one target species to another and from one area to another, potentially increasing impacts on protected species. Option 2 has similar impacts on protected species compared to Option 3. When compared to the No Action alternative, it could have increased potential impacts on protected species.

7.3.2.2.3 Option 3: Distribution of US TACs for Eastern/Western Georges Bank Haddock

Sub-Option A: This option would allow an adjustment to the EGB haddock quota prior to the start of the fishing year; the expected adjustment would be to reduce the EGB haddock quota and increase the WGB haddock quota. This alternative could increase fishing effort in the western area and increase impacts on protected species but could result in a decrease in impacts on protected species in the eastern area. Option 3 has similar impacts on protected species compared to Option 2. When compared to the No Action alternative, it could have increased potential impacts on protected species.

Sub-Option B: This option allows sectors or state-operated permit banks, to harvest their EGB haddock quota in the WGB stock area at any time during the fishing year. It is unknown how much EGB quota will be harvested in the WGB area or whether this sub-option would result in more EGB quota being move than sub-option A. This alternative could increase fishing effort in the western area and increase impacts on protected species but could result in a decrease in impacts on protected species in the eastern area. Option 3 has similar impacts on protected species compared to Option 2. When compared to the No Action alternative, it could have increased potential impacts on protected species.

7.3.2.3 GB Yellowtail Founder Management Measures

7.3.2.3.1 Option 1: No Action

This option would not alter existing measures for GB yellowtail flounder and is not expected to impact protected species. Compared to Options 2, this option would have negligible impacts on protected species.

7.3.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder

This option alters the stratification used for estimating discards of GB yellowtail flounder for in-season quota monitoring. If adopted this measure would allow fishing to continue in statistical area (SA) 522, an area that has been identified as having low abundance of yellowtail flounder, when the allocation is almost reached. This measure may increase interactions with protected species in this statistical area if a large amount of fishing effort shifts to the SA once the allocation is almost reached. Protected species in the remaining GB yellowtail flounder statistical areas may benefit from reduced impacts if fishing does shift from these areas. This option could have low negative impacts when compared to Option 1.

7.3.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

7.3.2.4.1 Option 1: No Action

This option would maintain the requirement for limited access scallop vessels to land all legal-sized yellowtail flounder. The No Action alternative is not expected to change current fishing activities resulting in low negative impacts on protected resources. However, interactions are not likely to increase under the No Action alternative. Option 1 would have less negative impact on protected species than Option 2.

7.3.2.4.2 Option 2: Prohibition on Possession of Yellowtail Flounder

This option would prohibit possession of GB and SNEMA yellowtail flounder stocks by limited access scallop vessels, i.e. they would be required to discard all yellowtail flounder. Effort control in the scallop fishery is based on DAS and this measure may not result in a large increase in fishing effort. Depending on the magnitude of the scallop sub-ACL for yellowtail flounder, this measure has the potential to increase effort by limited access scallop vessels if limited access vessels are not restricted by a potentially low sub-ACL. This could have increased impacts on protected species but is not thought to jeopardize protected species. Option 2 would have more negative impact on protected species than Option 1.

7.4 Economic Impacts

Consideration of the economic impacts of the changes made in this framework is required pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976. NEPA requires that 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) or Environmental Impact Statement (EIS) that includes the integrated use of the social sciences (NEPA Section 102(2)(C)). The MSA stipulates that the social and economic impacts to all fishery stakeholders should be analyzed for each proposed fishery management measure in order to provide advice to the Council when making regulatory decisions (Magnuson-Stevens Section 1010627, 109-47).

The NMFS provides a series of guidelines to be used when performing economic reviews of regulatory actions. The key dimensions for this analysis are expected changes in net benefits to fishery stakeholders, the distribution of benefits and costs within the industry, and changes in income and employment (NMFS 2007b). Where possible, cumulative effects of regulations will be identified and discussed. Other social concerns are discussed in Section 7.5. The economic impacts presented here consist of both qualitative and quantitative analyses dependent on available data, resources, and the measurability of predicted outcomes. In general, the regulations proposed in Framework 51 will impact revenue through changes to ACLs and fishery measures and may, for particular fisheries, impact operating costs through the modification of accountability measures and monitoring requirements. It is assumed throughout this analysis that changes in revenues will have downstream impacts on income levels and employment. However, these are only mentioned if directly quantifiable.

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

7.4.1.1 GOM Cod Rebuilding Strategy

7.4.1.1.1 Option 1: No Action

The current rebuilding strategy for Gulf of Maine (GOM) cod, adopted in Amendment 13, uses a fishing mortality target that is calculated to rebuild the stock by 2014 with a 50 percent (median) probability of success. The stock is unlikely to rebuild by that date in the absence of all fishing mortality and in 2012, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the MSA requires that a revised rebuilding program be implemented within 2 years for GOM cod. This No Action alternative would not address the Magnuson-Stevens Act requirement. If this option is adopted, fishing mortality (set at 75% F_{MSY}) as implemented in FW 50 would be maintained in 2014. However, because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015.

This option could result in no change in net economic impacts for 2014, but the resulting quota reductions for 2015 could cause severe disruptions to the groundfish fishery in the GOM stock area. Cod is a primary component of the multispecies catch in this region, and a quota set at or near levels consistent with "incidental bycatch" would impede the harvest of every groundfish stock. Commercial catches in the GOM would fall to trivial levels, resulting in a reduction of revenues that likely would approach 100% of those observed in FY2014. However, a zero-possession restriction could be imposed on cod in the GOM, thereby allowing fisherman to target other stocks while discarding cod. Such a restriction is unlikely to meet MSA requirements, but would dramatically decrease the economic costs associated with this Option.

Recreational fisheries would also experience significant economic losses, though these fisheries are perhaps better able to target stocks other than cod in the GOM. Economic losses for recreational fisheries may instead approach 50-80% reductions from FY2014 levels.

7.4.1.1.2 Option 2: Revised Rebuilding Strategy (Preferred Alternative)

Two options are being considered for a revised rebuilding strategy for GOM cod. Both rebuilding options assume no changes to the FY2014-2015 ABC (1,550 mt) that was previously recommended by the SSC, and adopted by FW 50.

Sub-Option A: This strategy would rebuild the stock in 8 years, with a 50 percent (median) probability of success by 2022. This strategy is developed to be more conservative compared to sub-Option B and is based on a fishing mortality rate that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ > 75% F_{MSY}).

Sub-Option B (Preferred Alternative): This strategy would rebuild the stock in 10 years, with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ and is not allowed to be initially limiting (i.e., $F_{rebuild}$ > 75% F_{MSY}).

In FY2014, there is no difference in economic impacts between the sub-options and relative to the No Action option. Both sub-options result in significantly greater economic benefits than the No Action option for FY2015 and beyond, because they appear to maintain fishing mortality targets at (or above) 75% F_{MSY}. Relative to Sub-Option B, Sub-Option A may be more likely to require reversion to a $F_{rebuild}$ below 75% F_{MSY} and potentially lower ACLs in FY2016 and beyond.

Subsequent framework actions will modify ACLs in accordance with the (sub-) option selected, and these actions will provide a more precise estimate of the economic impacts of ACLs on commercial and recreational fisheries.

If it were assumed, however, that improved targeting technology amongst other factors were to allow the fishing industry to capture 100% of the allocated quota for GOM cod, and if it were further assumed that the quotas as projected remain in place for the duration of the rebuilding time frame, it would be possible to compare the net present value, in 2013 dollars, of the two sub-options and the No Action option. This comparison is complicated by the presence of two competing models of the GOM cod stock, either of which may be used in quota setting. Therefore, two scenarios emerge for each sub-option, referred to here as the Base Case and M-Ramp models.

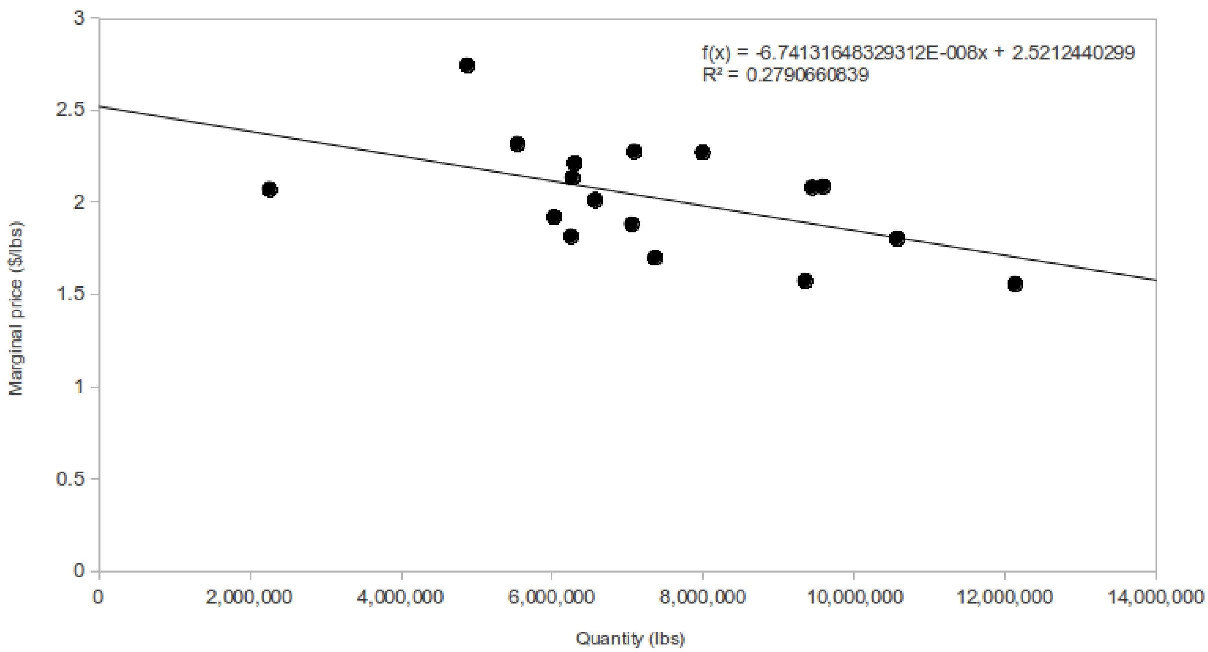
Comparison of alternative benefit streams over time requires discounting future benefits to convert all benefit streams to a present value. For this purpose, a discount rate of 3% was selected as recommended by NOAA to reflect the social rate of time preference (NOAA 2003). The Executive Branch Office of Management and Budget recommends a discount rate of 7% to estimate the rate of return on average investments. Both rates are included here for the sake of comparison. Net present values (NPVs) are calculated through 2024, the approximate terminal rebuilding date for this stock.

The NPV analysis translates the potential landing streams into future revenues, discounted as appropriate, by applying an average price to potential GOM cod landings. As previously stated, this analysis assumes implicitly that all allocated fish are caught, and it also assumes that a 10% discard rate is applied in all years to estimate landings.

NPVs are of GOM cod landings alone and do not take into account potential revenue losses or gains from the sale of other stocks of groundfish. A simple linear regression was used to calculate an average price based on price and quantity relationships for GOM cod from 1996 – 2011 (Figure 30). The resulting prices were then applied to the anticipated ACLs under the various scenarios (Table 62).

Given the assumptions of full use of ACLs and perfect realization of predicted ACLs through 2024, the results indicate that under the Base Case model, a 10-year rebuilding plan (Sub-Option B) would maximize net present value relative to an 8-year rebuilding plan (Sub-Option A) (Table 62). Under the M-Ramp model, there is little discernable difference between the two sub-options. Either sub-option is preferable to the No Action option which would likely yield very little economic benefits.

Figure 30 – Price and quantity relationship for GOM cod



Notes:
Data from 1996-2011 CFDERS. Prices in dollars.

Table 62 – Net present value estimates for revenues from GOM cod landings based on two different models, three Options and three discount rates (millions of dollars)

	Discount rate	8-year	10-year	No Action
Base Case	3%	$159	$167	$7
	7%	$124	$130	$7
	10%	$104	$109	$6
M-Ramp	3%	$172	$171	$7
	7%	$135	$135	$7
	10%	$114	$115	$6

7.4.1.1.3 Option 3: Rebuilding Plan Review Analysis for GOM Cod (Preferred Alternative)

This option must be selected in conjunction with an above option under Option 2.

Sub-Option A: Option 3, Sub-Option A (no action) would maintain the current biennial review process.

This sub-Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

Sub-Option B (Preferred Alternative): Option 3, Sub-Option B would establish a rebuilding plan review analysis for GOM cod for use during the new rebuilding period.

This sub-Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

7.4.1.2 American Plaice Rebuilding Strategy

7.4.1.2.1 Option 1: No Action

The current rebuilding strategy for American plaice, adopted in Amendment 13, uses a fishing mortality target that is calculated to rebuild the stock by 2014 with a 50 percent probability of success. The stock is unlikely to rebuild by that date in the absence of all fishing mortality, and in 2012, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the MSA requires that a revised rebuilding program be implemented within two years for American plaice. The No Action alternative would not address the MSA requirement. If this option is adopted, fishing mortality (set at 75% F_{MSY}) as implemented in FW 50 would be maintained in FY2014. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e., set as close to zero as possible) starting in FY2015.

This option would result in no change in net economic impacts for FY2014, but the anticipated quota reductions for FY2015 would result in severe disruptions to the groundfish fishery across all stock areas. American plaice is sometimes referred to as a “unit stock” species, meaning that it does not have multiple stocks within the management unit. As such, a low or *de minimis* allocation will result in loss of groundfish fishing opportunities coast-wide. The FY2012 value of groundfish catch was approximately $69 million in 2012 dollars. FY2014 revenues would be consistent with ACLs specified elsewhere in this document, and would be unaffected by this option, but FY2015 groundfish revenues would likely approach zero without other future changes to the management regulations, such as a zero possession restriction imposed on the fishery.

Recreational fisheries would be unaffected by this option, as there is no directed recreational fishery, and no recreational sub-allocation, for American plaice.

7.4.1.2.2 Option 2: Revised Rebuilding Strategy (Preferred Alternative)

Three options are being considered for a revised rebuilding strategy for American plaice. All three rebuilding options assume no changes to the FY2014-2015 ABCs that were previously recommended by the SSC, and adopted by FW 50.

Sub-Option A: The rebuilding strategy would be to rebuild the stock in 7 years with a 50 percent (median) probability of success by 2021. This strategy is the most conservative compared to sub-Options

B and C. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ > 75% F_{MSY}).

<u>Sub-Option B</u>: The rebuilding strategy would be to rebuild the stock in 8 years with a 50 percent (median) probability of success by 2022. This strategy is based on a fishing mortality that is above 75% F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ > 75% F_{MSY}).

<u>Sub-Option C (Preferred Alternative)</u>: The rebuilding strategy would be to rebuild the stock in 10 years with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75% F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ > 75% F_{MSY}).

In FY2014, there is no difference in economic impacts between the three sub-options and the No Action option. The sub-options result in significantly greater economic benefits than the No Action option for FY2015 and beyond, because they appear to maintain fishing mortality targets at (or above) 75% of F_{MSY}. In general, longer rebuilding programs have greater economic benefits. This result is consistently observed across all discount rates greater than approximately 1%.

Subsequent framework adjustment actions will modify ACLs in accordance with the (sub-) option selected, and these actions will provide a more precise estimate the economic impacts of ACLs on commercial and recreational fisheries.

If it were assumed, however, that improved targeting technology amongst other factors were to allow the fishing industry to capture 100% of the allocated quota for American plaice, and if it were further assumed that the quotas as projected remained in place for the duration of the rebuilding time frame, it would be possible to compare the net present value, in 2013 dollars, of the three sub-options and the No Action option.

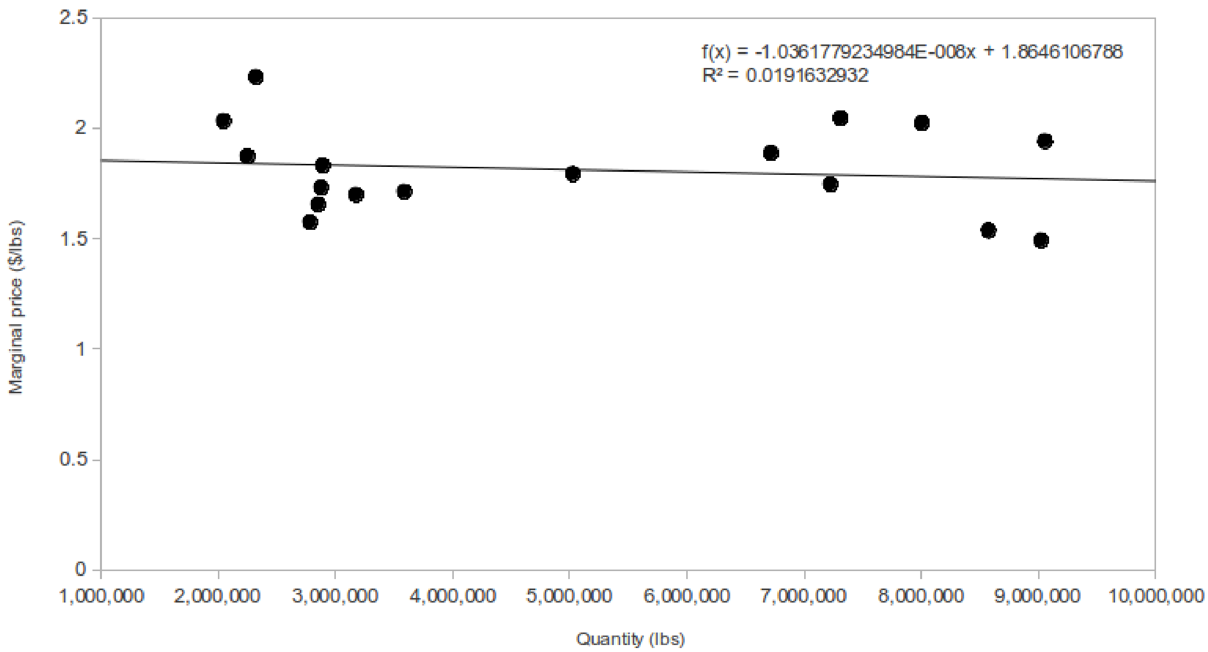
Comparison of alternative benefit streams over time requires discounting future benefits to convert all benefit streams to a present value. For this purpose, a discount rate of 3% was selected as recommended by NOAA to reflect the social rate of time preference (NOAA 2003). The Executive Branch Office of Management and Budget recommends a discount rate of 7% to estimate the rate of return on average investments. Both rates are included here for the sake of comparison. NPVs are calculated through 2024, the approximate terminal rebuilding date for this stock.

The NPV analysis translates the potential landing streams into future revenues, discounted as appropriate, by applying an average price to potential American plaice landings. Implicitly, again, this analysis assumes that all allocated fish are caught and a 10% discard rate is applied in all years to estimate landings. NPVs are of American plaice landings alone and do not take into account potential revenue losses or gains from the sale of other stocks of groundfish.

American plaice demonstrates a demand function where price is inelastic with respect to quantity (i.e., demands changes little due to price) (Figure 31). As such, a constant average price is applied to all landings and this price is applied to the anticipated ACLs under the various scenarios (Table 63).

Given the assumptions of full utilization of ACLs and perfect realization of predicted ACLs through 2024, the results indicate that there is little discernable difference between the three sub-options. The sub-options are generally preferable to the No Action option, since the No Action option yields very little economic benefits.

Figure 31 - Price and quantity relationship for American plaice



Notes:
Data from 1996-2011 CFDERS. Prices in dollars.

Table 63 - Net present value estimates for revenues from American plaice landings based on four Options and three discount rates (millions of dollars)

Discount Rate	7-year	8-year	10-year	No Action
3%	$74	$78	$80	$5
7%	$59	$61	$63	$5
10%	$50	$52	$54	$5

7.4.1.2.3 Option 3: Rebuilding Plan Review Analysis for American Plaice (Preferred Alternative)

This option must be selected in conjunction with an above option under Option 2.

Sub-Option A: Option 3, Sub-Option A (no action) would maintain the current biennial review process.

This sub-Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

Sub-Option B (Preferred Alternative): Option 3, Sub-Option B would establish a rebuilding plan review analysis for American plaice for use during the new rebuilding period.

This sub-Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

7.4.1.3 Annual Catch Limit Specifications

7.4.1.3.1 Option 1: No Action

By selecting Option 1, ACLs will be based on FW50 specifications for the years 2013-2014, which have missing values for many species (Table 64).Specifically, GB East cod and haddock, GB yellowtail flounder, and white hake would have no ACLs. Fishing would not be permitted for these species, nor would fishing be allowed in these species' broad stock areas. The portion of the GB East cod and haddock ACLs that would ordinarily be allocated to the eastern GB area would instead be allocated the western GB stock area, and consequently the ACLs for GB West cod and haddock are higher under the No Action option than under Option 2.

Table 64 – No Action Option Groundfish Sector sub-ACLs (lbs)

Species	Stock	Sector sub-ACL
American plaice		2,996,079
Cod	GB East	0
	GB West	3,913,201
	GOM	1,794,561
Haddock	GB East	0
	GB West	70,089,279
	GOM	480,607
Halibut		-
Ocean pout		-
Pollock		28,964,298
Redfish		23,197,012
White hake		0
Windowpane	North	-
	South	-
Winter flounder	GB	7,420,751
	GOM	1,521,849
	SNE/MA	2,134,072
Witch flounder		1,324,977
Wolffish		-
Yellowtail flounder	CC/GOM	1,029,558
	GB	0
	SNE	992,079

Economic impacts on the sector commercial groundfish fishery
As the white hake stock area encompasses the geographic range of the management unit, the adoption of the No Action option would almost certainly lead to a complete shut-down of the groundfish fishery, bringing fishery-wide commercial groundfish revenues to zero.

Economic impacts on the common pool commercial groundfish fishery
Similarly, the common pool would not have an allocation of white hake and vessels fishing in the common pool would likely be prohibited from participating in the groundfish fishery.

Economic impacts on the recreational groundfish fishery
Impacts on the recreational fishery are less certain. There is no recreational fishery in the eastern GB stock area, and no recreational sub-allocation for GB yellowtail flounder or white hake. It seems likely that the recreational fishery would not be significantly impacted by the adoption of the No Action alternative. Sub-allocations for other recreational stocks (GOM cod, haddock) are similar to those from

FY2013 and no measures are proposed in this framework action that would alter the administration of this fishery.

Economic impacts on the scallop fishery

The precise impacts of the No Action option on the scallop fishery are unclear. This option does not identify a scallop fishery sub-ACL for GB yellowtail flounder. While this would not prevent the scallop fishery from fishing in FY2014, it is not clear if the absence of a sub-ACL would be treated as if the sub-ACL was zero. If this were the case, then catches would lead to scallop fishery AMs being triggered in FY2015 and/or later years. As a result, this option would result in large reductions in scallop fishery revenues relative to Option 2. But if this is not the case, and the scallop fishery catches do not trigger AMs, then this option might allow for greater scallop fishery revenues than would be the case if AMs are triggered using the sub-ACL specified in Option 2.

7.4.1.3.2 Option 2: Revised Annual Catch Limit Specifications (Preferred Alternative)

Quota Change Model

As in past framework adjustment actions, the Quota Change Model (QCM) is used to predict the potential impact of changes in quota on the sector-based commercial fishery. The QCM is a simulation model that selects trips from existing catch records that are representative of those trips most likely to take place under the new quota conditions. A pool of 100,000 actual trips is selected based on each trip's use of allocated ACE, using fishery-dependent trip-level data from FY2012. The more efficiently a trip used its ACE, the more likely that trip is to be drawn into the pool, and, potentially, the more times that trip will be replicated within the pool. ACE efficiency is determined by the ratio of ACE expended to net revenues on a trip for each of the 16 allocated stocks. Net revenues are calculated as gross revenues minus trip costs minus quota leasing costs, where trip costs are based on observer data and quota leasing costs are estimated from an inter-sector lease value model based on FY2012 (Murphy, et al. 2012). Trips that were particularly ACE-inefficient are not drawn into the pool at all. The model pulls trips from the pool at random, summing the ACE expended for the 16 allocated stocks as trips are drawn. When one stock's ACE reaches the allocated limit, no trips from that broad stock area are selected and the model continues selecting trips until quota limits are achieved in all three broad stock areas or for one of the unit stocks.

By running simulations based on actual trips, the model implicitly assumes that stock conditions existing during the data period are representative, that trips are repeatable, and that price/quantity relationships realized during the data period are applicable to the forecast period (FY2014). Use of existing trip net revenues requires an assumption of constant trip costs and constant quota costs. These assumptions will surely not hold—fisherman will continue to develop their technology and fishing practices to increase their efficiency, market conditions will induce additional behavior changes, and fishery stock conditions are highly dynamic. Fuel and other costs may change due to larger economic shifts or shoreside industry consolidation. Quota lease prices will certainly increase under more restrictive allocations, though it is impossible to estimate the magnitude of these increases.

In general, the model will under-predict true landings and/or revenues if stock conditions improve, if prices rise in response to lower quantities landed, or if fisherman become more efficient at maximizing the value of their ACE. Conversely, the model will over-predict true landings and/or revenues if stock conditions decline, markets deteriorate or fishing costs increase. The model will over-predict landings if stock conditions for a highly constraining stocks are such that catchability increases substantially and/or fisherman are unable to avoid the stock--in this circumstance, better than expected stock conditions may lead to worse than anticipated fishery performance.

Economic impacts on the sector commercial groundfish fishery

Groundfish sector sub-ACLs (mt) for FY2010-2013 and Option 2 for FY2014 ACLs are summarized in Table 65. Output from the QCM is provided in Table 66.

Under Option 2, gross groundfish revenues for FY2014 are predicted to be just over $55 million and all gross revenues on groundfish trips are predicted to be just under $71 million (Table 67). This represents approximately a 26% reduction in all gross revenues on groundfish trips relative to FY2012 and a 4% reduction relative to those predicted in FY2013 (Table 67). On a home-port state level, New Hampshire is expected to have the largest percentage decline (32%) in gross revenues from groundfish relative to FY2012. Rhode Island is expected to be the least affected by these ACLs, with a small 7% predicted increase in gross groundfish revenues relative to FY2012. For major home-ports, Gloucester, MA is expected to have the largest percentage decline (33%) in gross revenue and New Bedford, MA is expected to be the least affected, with a 5% decline in gross groundfish revenues predicted (Table 68).

The impacts to gross revenues are expected to be distributed non-uniformly across different vessel length categories as well, with the 30-50 foot category experiencing the largest drop in gross revenue compared to FY2012, with a predicted 35% reduction (Table 69). Larger vessel classes are predicted to experience smaller declines in gross revenues, with the largest vessel size class (75+ ft.) predicted to see a 10% decline in gross revenues. This result is not surprising, as small vessels have less scalability in terms of landings and have a smaller geographic range. Net revenues, as opposed to gross revenues, are expected to decline much less substantially as lower allocations drive fisherman to fish as efficiently as possible (Table 67). The relatively large decline in predicted trip costs (fuel, ice, food, etc.) reflects an anticipated actual reduction, but most likely over-estimates the efficiency gains that will be possible in FY2014. Predicted trip costs for FY2013 are substantially lower than those predicted for FY2014 despite a similar number of trips, days absent, etc. This is in part a function of the optimization component of the QCM, which selects the most profitable trips (often the lowest-cost trips) disproportionately, but may also be signaling a trend in rising trip costs.

FY2014 is predicted to see a 21% decline in net revenues relative to FY2012 and a 12% decline relative to predicted net revenues for FY2013. Crew-days, days absent and total sector trips are all predicted to decline substantially relative to FY2012, as the model predicts only the most efficient trips will occur under continued restrictive quota allocations (Table 67). This represents fewer earning opportunities for crew members, and may signal reductions in incomes for down-stream fishing businesses such as fish dealers, ice houses, gear shops, and shipyards.

Table 65 – Groundfish Sector sub-ACLs (mt) for 2010-2013 and Option 2 for 2014

Species	Stock	FY2010	FY2011	FY2012	FY2013	Option 2, FY2014
American plaice		2,748	3,108	3,223	1,420	1,359
Cod	GB East	325	423	445	92	145
	GB West	2,977	3,878	4,079	1,715	1,584
	GOM	4,327	4,825	3,619	830	814
Haddock	GB East	11,913	9,065	8,111	3,754	9,971
	GB West	28,273	21,515	19,252	22,442	18,666
	GOM	799	778	648	187	218
Halibut		-	-	-		-
Ocean pout		-	-	-		-
Pollock		16,178	13,952	12,530	12,893	13,138
Redfish		6,756	7,541	8,291	10,132	10,522
White hake		2,505	2,974	3,257	3,849	4,308
Windowpane	North	-	-	-		-
	South	-	-	-		-
Winter flounder	GB	1,823	2,007	3,367	3,528	3,364
	GOM	133	329	690	714	690
	SNE/MA			-	1,210	968
Witch flounder		827	1,236	1,426	610	601
Wolffish		-	-		-	-
Yellowtail flounder	CC/GOM	729	940	1,021	479	467
	GB	803	1,142	364	116	252
	SNE/MA	235	524	607	570	450

Table 66 – Predicted Option 2 catch (lbs) and gross revenue by stock from simulation model (*500 realizations*)

Species	Stock	Limit	Catch	Use	Ex-vessel Value
American plaice		2,996,079	2,629,857	88%	$3,903,973
Cod	GB East	319,670	146,707	46%	$162,253
	GB West	3,492,118	3,363,083	96%	$6,820,426
	GOM	1,794,561	1,769,437	99%	$4,280,519
Haddock	GB East	21,982,266	804,401	4%	$1,219,368
	GB West	41,151,437	1,747,944	4%	$2,793,642
	GOM	480,607	367,450	76%	$780,661
Halibut		0	96,646	.	$146,703
Non-Groundfish		0	21,827,479	.	$15,437,992
Ocean Pout		0	76,571	.	$0
Pollock		28,964,298	11,869,407	41%	$10,856,342
Redfish		23,197,012	7,414,715	32%	$3,727,931
White Hake		9,497,503	4,259,018	45%	$5,698,826
Windowpane	North	0	228,891	.	$1
Windowpane	South	0	232,426	.	$0
Winter flounder	GB	7,416,342	4,477,145	60%	$9,061,821
	GOM	1,521,849	258,900	17%	$539,169
	SNE/MA	2,134,072	210,003	10%	$2,490
Witch flounder		1,324,977	1,301,836	98%	$2,467,637
Wolffish		0	44,458	.	.
Yellowtail flounder	CC/GOM	1,029,558	745,874	72%	$1,029,291
	GB	554,462	368,615	66%	$574,568
	SNE/MA	992,079	991,296	100%	$1,506,325
	TOTAL		**65,232,160**		**$71,009,940**
	TOTAL GROUNDFISH	**148,848,888**	**43,404,682**	**29%**	**$58,653,156**

Table 67 – Predicted outcomes under Option 2 based on 500 model realizations ($ millions)

	Gross revenue	Gross groundfish revenue	Net revenue	Total variable cost	Trip cost	Quota cost	Sector landing fees	Crew days	Days Absent	Number trips
FY2010	$ 95.8	$ 80.5	$ 53.3	$ 45.0	$ 20.7	$ 21.8	$ 2.5	55,992	18,401	13,474
FY2011	$ 109.8	$ 88.8	$ 53.5	$ 59.3	$ 29.2	$ 27.5	$ 2.7	65,450	21,465	15,958
FY2012	$ 95.4	$ 67.7	$ 46.2	$ 49.2	$ 30.3	$ 17.0	$ 2.0	65,669	19,556	14,487
FY2013 (predicted)	*$ 74.1*	*$ 55.8*	*$ 41.8*	*$ 32.3*	*$ 16.6*	*$ 13.8*	*$ 1.7*	*47,583*	*13,472*	*6,797*
FY2014 (predicted) *MIN*	*$ 64.7*	*$ 50.5*	*$ 33.7*	*$ 32.0*	*$ 19.6*	*$ 10.9*	*$ 1.4*	*20,918*	*6,892*	*6,091*
MAX	*$ 75.9*	*$ 59.2*	*$ 38.8*	*$ 38.3*	*$ 23.6*	*$ 13.0*	*$ 1.7*	*50,595*	*14,149*	*6,949*
MEAN	*$ 70.9*	*$ 55.5*	*$ 36.7*	*$ 35.2*	*$ 21.6*	*$ 12.0*	*$ 1.6*	*46,735*	*13,162*	*6,602*
STD	*$ 1.9*	*$ 1.6*	*$ 0.9*	*$ 0.7*	*$ 1.1*	*$ 0.4*	*$ 0.0*	*2,140*	*533*	*140*
% change FY2012	-26%	-18%	-21%	-29%	-28%	-29%	-20%	-29%	-33%	-54%
% change FY2013(p)	-4%	-1%	-12%	9%	30%	-13%	-8%	-2%	-2%	-3%

Table 68 – Predicted groundfish catch and gross revenue by homeport state and port under Option 2 from simulation model

	FY2010 Ex-vessel value	FY2011 Ex-vessel value	FY2012 Ex-vessel value	FY2013 (predicted) *Catch (lbs)*	FY2013 (predicted) Ex-vessel value	FY2013 (predicted) *Catch (lbs)*	FY2014 (predicted) Ex-vessel value	% change from FY2012
Connecticut	$ 35,081	$ 46,646	$ 12,778	*14,031*	$ 16,284	*18,387*	$ 14,766	16%
Massachusetts	$ 58,006,800	$ 64,605,304	$ 47,530,895	*29,945,047*	$ 38,255,313	*28,582,837*	$ 38,143,540	-20%
Boston	$ 14,251,495	$ 17,458,607	$ 13,203,964	*8,730,169*	$ 11,142,660	*8,429,184*	$ 10,925,097	-17%
Chatham	$ 2,482,876	$ 2,582,201	$ 957,320	*557,276*	$ 857,939	*503,753*	$ 833,477	-13%
Gloucester	$ 16,224,983	$ 16,807,126	$ 12,110,282	*9,068,082*	$ 9,962,835	*7,006,414*	$ 8,067,363	-33%
New Bedford	$ 18,149,740	$ 20,387,478	$ 16,213,206	*9,552,957*	$ 13,516,564	*10,852,708*	$ 15,482,606	-5%
Maine	$ 14,470,489	$ 14,599,316	$ 13,498,376	*12,820,916*	$ 12,683,212	*10,590,255*	$ 11,413,905	-15%
Portland	$ 10,269,562	$ 9,683,130	$ 8,841,043	*9,677,859*	$ 8,823,335	*7,795,446*	$ 7,627,913	-14%
New Hampshire	$ 3,347,576	$ 4,673,318	$ 3,110,230	*1,962,643*	$ 2,317,117	*1,576,817*	$ 2,107,929	-32%
New Jersey	$ 97,897	$ 66,667	$ 208,687	*1,424*	$ 1,315	*94,599*	$ 150,478	-28%
New York	$ 909,309	$ 1,262,452	$ 665,866	*352,138*	$ 581,975	*444,907*	$ 739,782	11%
Rhode Island	$ 3,123,923	$ 3,144,732	$ 2,536,242	*1,449,554*	$ 1,838,143	*1,957,761*	$ 2,723,910	7%
Point Judith	$ 2,412,589	$ 2,284,227	$ 1,848,403	*1,198,607*	$ 1,444,257	*1,509,505*	$ 2,043,208	11%
Other Northeast	$ 511,277	$ 365,959	$ 124,222	*69,987*	$ 119,577	*107,239*	$ 174,472	40%
TOTAL	**$ 80,502,352**	**$ 88,764,394**	**$ 67,687,297**	***46,615,739***	**$ 55,812,937**	***43,372,802***	**$ 55,468,783**	**-18%**

Table 69 – Predicted groundfish catch and gross revenue by vessel length class under Option 2 from simulation model

Length class	FY2010	FY2011	FY2012	FY2013 (predicted)	FY2014 (predicted)
<30'	$ 16,485,506	$ 496,779	$ 527,746	$ 19,114	$ 447,791
30'to<50'	$ 24,689,727	$ 18,835,175	$ 13,457,745	$ 10,001,904	$ 8,671,624
50'to<75'	$ 39,225,644	$ 28,294,806	$ 22,332,585	$ 17,559,012	$ 18,105,071
75'+	$ 107,682	$ 41,142,431	$ 31,369,221	$ 28,232,906	$ 28,244,296
TOTAL	**$ 80,508,559**	**$ 88,769,191**	**$ 67,687,297**	**$ 55,812,937**	**$ 55,468,783**

Economic impacts on the common pool commercial groundfish fishery
As with sectors, Option 2 could result in declines in catch for the common pool fishery, which would have negative economic impacts for this component of the fishery.

Economic impacts on the recreational groundfish fishery
Recreational fishermen target GOM haddock, GOM cod, pollock, and GOM winter flounder, with GOM cod and GOM haddock a particularly important part of the catch (see Amendment 16 for a description of the recreational fishery in the GOM). As shown in Section 6.5.9.3, there have been recent declines in recreational groundfish fishing activity. These declines are likely to continue given the low allocations for GOM cod and GOM haddock for FY2014.

Option 2 could directly affect recreational anglers and have an indirect impact on charter/party operators through a potential change in passenger demand for charter/party fishing trips. However, the exact measures that will be in place are likely to be carried over from FY2013. There is likely to be no difference in economic impacts between Option 1 and Option 2.

Economic impacts on the scallop fishery
If the scallop fishery triggers the GB yellowtail flounder AMs, Option 2 would likely reduce scallop fishery revenues. However how this reduction in revenue compares to the Option 1/No Action is unclear. The No Action does not identify a scallop fishery sub-ACL for GB yellowtail flounder. While this would not prevent the scallop fishery from fishing in FY2014, it is not clear if the absence of a sub-ACL would be treated as if the sub-ACL was zero. If this were the case, then catches would lead to scallop fishery AMs being triggered in FY2015 and/or later years. As a result, No Action/Option 1 would result in large reductions in scallop fishery revenues relative to Option 2. But if this is not the case, and the scallop fishery catches do not trigger AMs, then Option 1/No Action might allow for greater scallop fishery revenues than would be the case if AMs are triggered using the sub-ACL specified in Option 2.

7.4.2 Commercial and Recreational Fishery Measures

7.4.2.1 Small Mesh Fishery Accountability Measures

7.4.2.1.1 Option 1: No Action

This option would not establish additional accountability measures (AMs) for the small-mesh fishery for Georges Bank yellowtail flounder under the Multispecies FMP. FW 48 adopted a sub-ACL of GB yellowtail flounder beginning in FY2013. If the U.S. TAC (equal to the U.S. ABC) for GB yellowtail flounder is exceeded, the U.S./Canada Resource Sharing Understanding requires that the U.S. TAC for the following fishing year be reduced by the amount of the overage. Option 1 would not change the existing regulatory requirements for the small-mesh bottom-trawl fishery. No new economic impacts are expected.

7.4.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL (Preferred Alternative)

Two options (one with two sub-options) are being considered for the small-mesh fishery AM.

Sub-Option A: If the sub-ACL is zero for the small-mesh fishery, or a sub-ACL is not specified, then vessels fishing with bottom otter trawl gear with a cod-end mesh size less than 5 inches would be prohibited from fishing in the Georges Bank yellowtail flounder stock area (Statistical Areas 522, 525, 561 and 562). Because of the timing of availability of data for this fishery, the AM would likely be implemented in the fishing year following the notification of the overage.

Sub-Option B1: The AM would be implemented if both the total ACL and the small-mesh fishery sub-ACL for GB yellowtail flounder are exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of GB yellowtail flounder.

Sub-Option B2 (Preferred Alternative): The AM would be implemented if the small-mesh fishery sub-ACL of GB yellowtail flounder is exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of GB yellowtail flounder.

Economic Impacts on the Groundfish fishery
Compared to No Action/Option1, by reducing the GB yellowtail flounder bycatch discards in the small-mesh fishery, it is less likely that overfishing will occur in these areas and catch rates of groundfish trips may increase slightly for groundfish vessels. This may result in higher net revenue for Sub-Options A, B1, and B2 relative to No Action. In addition, groundfish sub-ACLs could be increased slightly as a result of reduced discards.

Economic Impacts on the Small-mesh fisheries
Relative to the No Action/Option 1, by closing the GB yellowtail flounder stock area to small-mesh fisheries when the AM was triggered under Option A, fishing would be displaced out of that area which could also displace revenue and increase costs. Small-mesh fishing effort would likely increase in the next best place to fish, potentially lowering catch rates of target stocks and increasing associated costs.

Information in revenue and landings from the longfin squid and whiting fisheries within the GB yellowtail flounder stock area and adjacent areas can be found in Section 6.5.11.

Relative to the No Action/Option1 and Option A, the small-mesh fishermen would likely experience higher costs including the fixed cost of purchasing new gear/modifying existing gear under Sub-Options B1 and B2. Their operating costs would probably increase due to the gear restrictions (i.e., likely lower catch rates), effectively lowering their net revenue and overall profitability.

7.4.2.2 Management Measures for US/CA TACs

7.4.2.2.1 Option 1: No Action

If this option is adopted, the U.S./Canada TACs would be specified at the beginning of the fishing year, and there would be no in-season adjustments to the U.S./Canada TACs. This option would not consider the quota trading mechanism established by the TMGC and U.S./Canada Steering Committee, and would not allow additional quota to be distributed to the U.S. at the end of the Canadian fishing year (December). Under this option, there would also be no adjustment to the amount of the U.S. TAC for eastern GB haddock that is allocated to the Eastern U.S./Canada Management Area.

This option would not change existing fishery regulations and would have no new economic impacts.

7.4.2.2.2 Option 2: Revised In-Season Adjustment for US/CA TACs (Preferred Alternative)

Option 2 would allow the Regional Administrator to make in-season adjustments to U.S./Canada TACs. Additional allocation of quota would be consistent with current ABC distribution, including both groundfish and non-groundfish vessels.

Option 2, is not expected to alter, in the short term, the aggregate amount of GB haddock caught by in the groundfish fishery. Catch is persistently less than allocation for both the eastern and western stocks of GB haddock. Option 2 is expected to have no additional economic impacts, positive or negative, relative to Option 1. Further, it is not known at this time if this option would increase or decrease quota allocated to groundfish fishermen. However, if the ability to alter quotas in season were to result in increased quota for sector and/or common pool fishermen, and if that quota were to be converted into landings, then Option 2 could be viewed as economically beneficial.

7.4.2.2.3 Option 3: Distribution of US TACs for Eastern/Western Georges Bank Haddock (Preferred Alternative)

Sub-Option A: If this option is adopted, the Regional Administrator, in consultation with the Council, would be allowed to adjust the portion of the U.S. TAC for Eastern GB haddock that is available in the Eastern U.S./Canada Area.

Sub-Option A is administrative in nature, and does not propose any particular quota adjustment. To the extent that they better allow the Regional Administrator to increase the flexibility of fishing operations on Georges Bank, it should be considered economically beneficial.

Sub-Option B (Preferred Alternative): A sector, or state-operated permit bank, may convert its Eastern GB haddock ACE to Western GB haddock ACE at any time during the fishing year, and up to two weeks into the following fishing year (unless otherwise instructed by NMFS) to cover any overage during the previous fishing year.

Sub-Option B is administrative in nature, and does not propose any particular quota adjustment. To the extent that they better allow the Regional Administrator to increase the flexibility of fishing operations on Georges Bank, it should be considered economically beneficial.

7.4.2.3 Georges Bank Yellowtail Flounder Management Measures

7.4.2.3.1 Option 1: No Action

Under Option 1, there would be no changes to the management measures for GB yellowtail flounder for estimating discards. Option 1 would neither change the current discard rates used for GB yellowtail flounder quota monitoring nor the existing regulatory requirements for the small-mesh bottom-trawl fishery. Yellowtail flounder are primarily caught in the shallower waters of GB, mainly SA 522. The No Action alternative would not develop a different discard stratum for yellowtail flounder taking this into account, therefore fishing activity in the entire GB stock area could be negatively impacted by catches in SA 522 if an AM is triggered. Under Option 1, no new economic impacts are expected.

7.4.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder (Preferred Alternative)

This option would modify the stratification used for estimating discards of GB yellowtail flounder for in-season quota monitoring of sector catches. It would not change the stratification used in assessments, nor would it change the stratification used to monitor common pool fishing trips. Option 2 would modify the spatial stratification used to estimate discards for in-season quota monitoring. A separate discard rate would be calculated for statistical area 522 from all other GB yellowtail flounder statistical areas.

There are a number of potential economic impacts associated with this option. If the discard rate is lowered in area 522, vessels fishing in that area will be able to expend less GB yellowtail flounder quota on each trip, increasing net revenues by allowing for more fishing. This is expected to have the largest effect on trawl vessels, since they are the vessels that predominantly fish in area 522. If area 522 is removed from the discard rate calculation for other areas, the discard rate for other areas would likely be higher than in the past (Section 7.1.2.3.2). This will represent decreased net revenues to vessels fishing in those areas, because the opportunity cost of quota will likely increase. If area 522 becomes relatively more profitable to fish in than the other statistical areas, there could be a shift in spatial effort to area 522 by other trawl vessels. This could have unforeseen impacts on area-specific fishing levels, which could have negative long-term MSY consequences.

7.4.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

7.4.2.4.1 Option 1: No Action

For limited access scallop fishery vessels, there would be no trip limit for yellowtail flounder stocks (GB and SNE/MA) and limited access scallop vessels will be required to land all legal-sized yellowtail flounder that is caught, as established in FW 44 to the Northeast Multispecies FMP.

Economic Impacts on the Groundfish Fishery
This option maintains the requirement for limited access scallop vessels to land all legal sized yellowtail flounder catch for each trip. The groundfish fishery is not directly impacted as long as scallop vessels do not target yellowtail flounder as a result of this measure and increase overall mortality on yellowtail flounder. In addition, more precise accounting of yellowtail flounder catch in the limited access scallop fishery may over the long term improve the accuracy of the yellowtail flounder stock assessments with commensurate benefits accruing to vessels participating in both the sector and common pool groundfish fisheries.

Economic Impacts on the Scallop Fishery
If some yellowtail flounder vessels are targeting yellowtail flounder as a result of the current requirement to retain all legal sized yellowtail flounder, that could have potentially negative impacts on the overall scallop fishery if it increases yellowtail flounder catch and causes the ACL to be exceeded, triggering AMs for the scallop fishery. A limited number of limited access vessel that are landing yellowtail flounder will lose some income, but the majority of limited access vessels are not landing yellowtail flounder, and it is a small fraction of total revenue so impacts are very limited (see Table 48,Table 49,Table 50,Table 51, and Table 52)

7.4.2.4.2 Option 2: Prohibition on Possession of Yellowtail Flounder (Preferred Alternative)

For limited access scallop fishery vessels, there would be zero possession of yellowtail flounder stocks (GB and SNE/MA). Under this option, yellowtail flounder could not be landed or sold by the limited access scallop fishery.

Economic impacts on the Groundfish Fishery

This option requires limited access scallop vessels to discard all yellowtail flounder caught while fishing under the Atlantic sea scallop FMP. The groundfish fishery is not directly impacted. Accurate catch information is necessary for accurate stock assessments, and the groundfish fishery is impacted in the medium to long term by the accuracy and stability of three separate stock assessments: southern New England yellowtail flounder, Georges Bank yellowtail flounder, and the annual Trans-boundary Resource Sharing Agreement shared-stock yellowtail flounder assessment. This option will influence both true removals and removal estimate accuracy for the yellowtail flounder caught in the limited access scallop fishery. If true removals remain below the sub-allocation for the fishery, this option will have a positive medium and long-term effect on vessels participating in both the sector and common pool groundfish fisheries.

In a general sense, all mandatory discard programs create economic losses as potentially valuable landings are converted into discards. In this case, those losses accrue to the scallop fishery and are not shared by the groundfish fishery. The Atlantic sea scallop fishery is restricted by a sub-allocation of yellowtail flounder which is designed to limit yellowtail flounder mortality in the scallop fishery. Accurately accounting for yellowtail mortality in this fishery is dependent upon accurate discard observations and/or estimates. To the extent that sampling observations form a valid basis for population-level estimates (i.e. discard rates are consistent across both the sampled and unsampled populations) a sufficient level of sampling should enable accurate estimates of aggregate yellowtail flounder removals in this fishery, and therefore will have a positive medium and long-term economic impact on the groundfish fishery.

If, however, representativeness assumptions necessary to scale from sampling units to populations are violated, removal estimates may be inaccurate. The primary driver for inaccuracy in this case would be increased discard rates on unobserved scallop fishing trips. Additionally, this option may not provide as strong an incentive to avoid yellowtail flounder catch as Option 1/No Action. If either, or both, of these factors result in the limited access scallop fishery exceeding their sub-allocation of yellowtail flounder, and this results in delayed stock rebuilding, the groundfish fishery will face direct medium-term economic losses from foregone potential catch. If these factors lead to inaccurate removal estimates for this fishery, the accuracy and/or stability of yellowtail flounder stock assessments may degrade in the medium to long term, with commensurate negative effects on vessels participating in both the sector and common pool groundfish fisheries.

Economic Impacts on the Scallop Fishery

Relative to Alternative 1/No Action, the requirement to land all legal sized yellowtail flounder under Groundfish FW44 was expected to reduce discards of yellowtail flounder and improve estimates of scallop fishery catches of yellowtail, to the extent vessels complied with the requirement. Based on observer data from 2011-2013, it does not appear that discards have been reduced substantially because the majority of legal sized yellowtail flounder is still being discarded. In addition, if most legal sized yellowtail flounder are still being discarded, the overall estimates of scallop fishery catches have likely not improved as a result of this requirement. If compliance improves, some of these potential benefits may be more realized.

If scallop vessels are prohibited from retaining and landing yellowtail flounder there could be some economic loss for vessels that have been landings yellowtail flounders. Only a relatively small proportion of the limited access fishery is currently landing YT, about 60-80 vessels depending on the year. The number of vessels landing yellowtail flounder does seem to have increased since the requirement to land legal sized yellowtail flounder went into effect in May 2010, but the majority of limited access vessels do not land yellowtail flounder. Total yellowtail flounder landings increased in 2011, but declined again in 2012 and 2013. Average revenue per vessel that has landed yellowtail flounder is about $2,000-6,000 dollars, or less than 5% of total revenue. Therefore, the impact of zero possession would only impact a relatively small proportion of the fishery, and impacts would be expected to be small since yellowtail flounder landings revenue is a very small percentage of total revenue for these vessels.

7.5 Social Impacts

The current interpretation of 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); herring dealers and processors; final users of herring; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. Furthermore, there are other stakeholders who may be affected, such as those with businesses that rely on herring as forage (e.g., the whale watch industry). 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 herring 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 2007a) 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:

- *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.
- 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.
- 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.
- 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.

- 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 2007a).

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

7.5.1.1 Gulf of Maine Cod Rebuilding Strategy

7.5.1.1.1 Option 1: No Action

Option 1, the No Action alternative, would retain the target rebuilding end date of 2014. Given the current status of the stock, it is unlikely that GOM cod will be rebuilt by 2014. Thus, the fishing mortality for GOM cod would be based on incidental bycatch (i.e., reduced to as close to zero as possible) starting in FY2015 until the stock is rebuilt.

Under Option 1, many of the management options that might allow limited harvesting in FY2015 and beyond would be precluded, in favor of the measure most likely to offer the quickest rebuilding of the stock. Because Option 1 would dictate the necessary management measures to speed the rebuilding of the GOM cod stock, it could have a negative impact on the *Attitudes, Beliefs and Values* of the fishermen regarding management. To many vessel owners and operators in the Northeast groundfish fishery, the rules that limit fishing are considered inflexible and based on poorly understood science (Holland et al. 2010). Option 1 could perpetuate this negative view of management and government when it comes to the flexibility of rebuilding targets. Option 1 could also have negative impacts on the *Size and Demographic Characteristics* of the fishery as well as the *Historical Dependence on and Participation* in the fishery starting in FY2015, since GOM cod would be effectively reduced to a bycatch-only fishery, and there would no longer be participants in the directed fishery. Option 1 could particularly impact communities that rely on GOM cod.

Table 28 demonstrates that landings of GOM cod are important to primary and secondary ports throughout the Northeast US. Due to the fact that multiple groundfish species are caught in conjunction, a zero allocation of GOM cod would inhibit harvest of other groundfish species in the GOM as well. If Option 1 leads to successful rebuilding of the GOM cod stock, then there could be long-term positive impacts, unless markets, processing capability, and other infrastructure that are lost during the period of low catch are unable to recover when the stocks rebuild.

7.5.1.1.2 Option 2: Revised Rebuilding Strategy for Gulf of Maine Cod (Preferred Alternative)

Two options are being considered for a revised rebuilding strategy for GOM cod, but neither would change the FY 2014-2015 ABC (1,550 mt). For FY2014, there is no difference in social impacts between Option 1 and Option 2. Compared to the No Action alternative, Option 2 is likely to have positive social impacts. The differential impacts of Option 2, Sub-Option A and B are difficult to determine and will depend upon whether or not the rebuilding target under each scenario is successfully met. Sub-Option B may have the most positive short-term impacts due to its higher fishing mortality rate. However, Sub-Option A may have more long-term positive impacts, as it could lead to quicker rebuilding of the fishery to sustainable levels.

Sub-Option A: Option 2, Sub-Option A would revise the target rebuilding date for GOM cod, with a median probability of success, to 2022. Fishing mortality would be above 75% F_{MSY}.

Option 2, Sub-Option A would likely have short-term positive social impacts relative to No Action, as it would allow a higher level of fishing effort to be directed on GOM cod. This alternative could have a small positive impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce, if it allows for higher harvest of GOM cod. Long-term social impacts could be positive if this alternative successfully rebuilds the GOM cod fishery. There may also be a small positive impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management because Option 2, Sub-Option A would not require the most rapid stock rebuilding measures.

Sub-Option B (Preferred Alternative): Option 2, Sub-Option B would revise the target rebuilding date for GOM cod, with a median probability of success, to 2024. Fishing mortality would be above 75% F_{MSY}.

Option 2, Sub-Option B would likely have short-term positive social impacts, relative to No Action, as it would allow a higher level of fishing effort to be directed on GOM cod. This option could have a small positive impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce, if it allows for higher harvest of GOM cod in the near-term. Long-term social impacts could be positive if the GOM cod fishery is rebuilt. There may also be a small positive impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management because Option 2, Sub-Option B would not require the most rapid stock rebuilding measures.

7.5.1.1.3 Option 3: Rebuilding Plan Review Analysis for Gulf of Maine Cod (Preferred Alternative)

This option must be selected in conjunction with an above option under Option 2.

Sub-Option A: Option 3, Sub-Option A would maintain the current biennial review process.

Sub-Option A could have a negative impact to the *Attitudes, Beliefs and Values* of stakeholders who believe, when rebuilding has not occurred, additional investigation as to why is warranted. However, there could be positive impacts related to maintaining the status quo, as it would continue consistent review processes across fisheries.

Sub-Option B (Preferred Alternative): Option 3, Sub-Option B (under specific conditions), would establish a rebuilding plan review analysis for GOM cod for use during the new rebuilding period.

Sub-Option B could have a positive impact to the *Attitudes, Beliefs and Values* of stakeholders towards management, because it would assure that the most current information is used in decision making and it could lead to more flexible and responsive management. This benefit could be offset due to the fact that this new rebuilding plan review process would only apply to the GOM cod fishery. If this review process proves beneficial, stakeholders may feel that the process should be applied for all stocks in the fishery.

7.5.1.2 American Plaice Rebuilding Strategy

7.5.1.2.1 Option 1: No Action

Option 1, the No Action alternative, would retain the target rebuilding end date of 2014. Given the current status of the stock, it is unlikely that American plaice will be rebuilt by 2014. Thus, the fishing mortality for American plaice would be based on incidental bycatch (i.e., reduced to as close to zero as possible) starting in FY2015 until the stock is rebuilt.

Under Option, many of the management options that might allow limited harvesting in FY2015 and beyond would be precluded, in favor of the measure most likely to offer the quickest rebuilding of the stock. Because Option 1 would dictate the necessary management measures to speed the rebuilding of the American plaice stock, it could have a negative impact on the *Attitudes, Beliefs and Values* of the fishermen regarding management. To many vessel owners and operators in the Northeast groundfish fishery, the rules that limit fishing are considered inflexible and based on poorly understood science (Holland, et al. 2010). Option 1 could perpetuate this negative view of management and government when it comes to the flexibility of rebuilding targets. Option 1 would also have negative impacts on the *Size and Demographic Characteristics* of the fishery as well as the *Historical Dependence on and Participation* in the fishery starting in FY2015, as American plaice would be effectively reduced to a bycatch-only fishery. Option 1 could particularly impact communities that rely upon American plaice.

Table 28 demonstrates that landings of American plaice are important to primary and secondary ports throughout the Northeast US. Due to the fact that multiple groundfish species are caught in conjunction and the American plaice stock unit comprises the entire Gulf of Maine and Georges Bank region, a fishing mortality of zero for American plaice would impact the entire groundfish fishery. If this option leads to successful rebuilding of the American plaice stock, then there could be long-term positive impacts, unless markets, processing capability, and other infrastructure that are lost during the period of low catch are unable to recover when the stocks rebuild.

7.5.1.2.2 Option 2: Revised Rebuilding Strategy for American Plaice (Preferred Alternative)

Three options are being considered for a revised rebuilding strategy for American plaice. Compared to the No Action alternative, Option 2 is likely to have positive social impacts. For FY2014, there is no difference in social impacts between Option 1 and Option 2. The differential impacts of Option 2, Sub-Option A, B and C are difficult to determine and will depend upon whether or not the rebuilding targets are successfully met. Sub-Option C may have the most positive short-term impacts due to higher fishing effort. However, Sub-Option A may have more long-term positive impacts, as it could lead to quicker rebuilding of the fishery to sustainable levels.

<u>Sub-Option A</u>: Option 2, Sub-Option A would revise the target rebuilding date for American plaice, with a median probability of success, to 2021. Fishing mortality would be above 75% F_{MSY}.

Option 2, Sub-Option A would likely have short-term positive social impacts, as it would allow a higher level of fishing effort to be directed on American plaice. This option could have a small positive impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce, if it allows for higher harvest of American plaice. Long-term social impacts could be positive if this alternative successfully rebuilds the American plaice fishery. There may also be a small positive social impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management, because Option 2, Sub-Option A would require less rapid stock rebuilding measures relative to No Action.

<u>Sub-Option B</u>: Option 2, Sub-Option B would revise the target rebuilding date for American plaice, with a median probability of success, to 2022. Fishing mortality would be above 75% F_{MSY}.

Option 2, Sub-Option B would likely have short-term positive social impacts as it would allow a higher level of fishing effort to be directed on American plaice. This alternative could have a small positive impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce, if it allows for higher harvest of American plaice. Long-term social impacts could be positive if this alternative successfully rebuilds the American plaice fishery. There may also be a small positive social impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management, because Option 2, Sub-Option B would not require the most rapid stock rebuilding measures.

Sub-Option C (Preferred Alternative): Option 2, Sub-Option C would revise the target rebuilding date for American plaice with a median probability of success to 2024. Fishing mortality would be above 75% F_{MSY}.

Option 2, Sub-Option B would likely have short-term positive social impacts as it would allow a higher level of fishing effort to be directed on American plaice. This alternative could have a small positive impact on the overall *Size and Demographic Characteristics* of the fishery-related workforce, if it allows for higher harvest of American plaice. Long-term social impacts could be positive if this alternative successfully rebuilds the American plaice fishery. There may also be a small positive social impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management because Option 2, Sub-Option C would not require the most rapid stock rebuilding measures.

7.5.1.2.3 Option 3: Rebuilding Plan Review Analysis for American Plaice (Preferred Alternative)

This option must be selected in conjunction with an above option under Option 2.

Sub-Option A: Option 3, Sub-Option A (no action) would maintain the current biennial review process.

Sub-Option A could have a negative impact to the *Attitudes, Beliefs and Values* of stakeholders, who believe, when rebuilding has not occurred, additional investigation as to why is warranted. However, there could be positive impacts related to maintaining the status quo as it would continue consistent review processes across fisheries.

Sub-Option B (Preferred Alternative): Option 3, Sub-Option B would establish a rebuilding plan review analysis for American plaice for use during the new rebuilding period.

Sub-Option B could have a positive impact to the *Attitudes, Beliefs and Values* of stakeholders, because it would reaffirm that the most current information would be used in decision making and it could lead to more flexible and responsive management. This benefit could be offset due to the fact that this new rebuilding plan review process would only apply to the American plaice fishery. If this review process proves beneficial, stakeholders may feel that the process should be applied for all stocks in the fishery.

7.5.1.3 Annual Catch Limits

7.5.1.3.1 Option 1: No Action

Option 1, the No Action alternative, would retain constant groundfish fishery ACLs from FY2013 for FY2014-2015, with the exception of white hake, which would have an ACL of zero. Fishing would not be allowed in these species' broad stock areas. There would also be no allocations for the US/Canada Resource Sharing Understanding quotas of EGB cod, EGB haddock and EGB yellowtail flounder for FY2014.

Option 1 would have a large negative impact on the *Size and Demographic Characteristics* of the fishery-related workforce and the *Historical Dependence on and Participation in* the fishery.

The zero ACL for white hake and lack of US/Canada quotas could have a large negative social impact on the individuals and communities involved with the groundfish fishery, particularly those who target white hake, EGB cod, EGB haddock or EGB yellowtail flounder, or catch these stocks in conjunction with others.

Table 28 demonstrates that landings of white hake are important to primary and secondary ports throughout the Northeast US. 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 white hake stock unit, a zero ACL for white hake would likely result in a shutdown of the entire groundfish fishery. This would cause severe negative social impacts for the commercial fishery.

Such a severe limitation on fishing could cause a change in the *Size and Demographics* of the groundfish fishery by reducing the number of vessels and fishermen involved. This could also cause distrust in management because the zero allocation for white hake and lack of allocation for US/Canada Resource Sharing stocks would be seen as a failure on the part of management. This could have a negative impact on the formation of *Attitudes and Beliefs.*

If Option 1 changes *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 white hake. Selecting Option 1 could lead to perceived inequities between the commercial and recreational fishery components, if the recreational fishery can continue fishing while the commercial fishery cannot.

7.5.1.3.2 Option 2: Revised Annual Catch Limit Specifications (Preferred Alternative)

Option 2 would specify the annual specifications for FY2014 through FY2015 as in Table 4. For all stocks, except white hake, these specifications are the same as Option 1. Option 2 would also adopt specifications for the US/CA Resource Sharing Understanding quotas.

Option 2 would have generally positive social impacts relative to No Action, as all stocks would have specified catch limits. The *Size and Demographic Characteristics* of the fishery-related workforce would be unchanged or experience a slight improvement, as would and the *Historical Dependence on and Participation in* the fishery.

Table 28 demonstrates that landings of cod and haddock are important to primary and secondary ports throughout the Northeast US, particularly in Maine, New Hampshire and Massachusetts. Compared to Option 1/No Action alternative, it is likely that Option 2 could provide some positive social benefits for individuals and communities involved in the multispecies fishery. Because white hake is not overfished and overfishing is not occurring (Section 6.2.1.14), Option 2 would likely result in more positive *Attitudes and Beliefs* of stakeholders towards management than Option 1.

For some stocks, selecting Option 2 would result in lower catch limits relative to no action, continuing an overall trend in allocation reductions from previous years. Under Option 2, there are likely to be reduced fishing opportunities in FY2014 and FY2015 relative to prior years, likely resulting in increased negative social impacts for the fishery. However, because Option 1 would likely result in shutting down the fishery, Option 2 would likely have more positive social impacts relative to Option 1.

U.S./Canada TACs

The U.S./Canada TACs for EGB cod, EGB haddock, and EGB yellowtail flounder specified under Option 2 are described in Table 2. A comparison of the proposed FY2014 U.S. TACs and the FY2013 U.S.

TACs shown in Table 4 shows the percent change in U.S. allocations between the two years. For all three stocks, the 2014 U.S. allocation is a substantial increase (53-166%) from the 2013 allocations. This could result in positive social impacts. Vessel operators, families and communities that fish offshore, particularly those who are reliant on the groundfish fishing opportunities in EGB will experience the greatest beneficial impact from this alternative. The increased allocations 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.

7.5.2 Commercial and Recreational Fishery Measures

7.5.2.1 Small-Mesh Fishery Accountability Measures

7.5.2.1.1 Option 1: No Action

Option 1, the No Action alternative, would establish no additional Accountability Measures for the small-mesh fishery for Georges Bank yellowtail flounder. Under current AMs, if the US TAC is exceeded, the sub-ACL of the component of the fishery that caused the overage would be reduced the following fishing year by the same amount as the overage. Because the small-mesh fishery is currently prohibited from landing GB yellowtail flounder, there is effectively no sub-ACL to reduce.

Option 1 would have a negative social impact on the *Attitudes, Beliefs and Values*, of the participants in the multispecies fishery, because it would perpetuate discrepancies in AMs for different components of the fishery. The perception of differential treatment could create conflicts, particularly with other components of the fishery that are subject to pound-for-pound paybacks. This could have a negative impact on the *Non-Economic Social Aspects* of the fishery.

7.5.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL (Preferred Alternative)

Two options (one with two sub-options) are being considered for the small-mesh fishery AM.

<u>Sub-Option A</u>: Under Option 2, Sub-Option A, when an overage occurs and the small-mesh fishery has a zero sub-ACL for GB yellowtail flounder, or a sub-ACL is not specified, an area closure would be implemented the following year that would prohibit vessels with small-mesh gear from fishing in the GB yellowtail flounder stock area (Section 4.2.1.2). The AM would be implemented in the fishing year following the notification of the overage.

Sub-Option A would have no substantial social impacts expected from creating this AM, but if this AM is triggered, it could cause a disruption in fishing practices, particularly if the fishery does not pro-actively use gear that reduces GB yellowtail flounder bycatch. As it is intended, this AM would change where the small-mesh fishery fishes, which would have an impact on the *Historic and Present Participation* in the fishery. To the small-mesh fishery, an area closure could have more negative social impacts than mandatory gear modifications. Thus, Sub-Option A may result in more negative impacts than Sub-Option B.

Option 2, Sub-Option A could have a positive impact on the *Attitudes, Beliefs and Values*, of the participants in the multispecies fishery, because it could be seen as more fair management of different components of the fishery. This may decrease conflicts, particularly with other components of the fishery that are subject to pound-for-pound paybacks. This could have a positive impact on the *Non-Economic Social Aspects* of the fishery.

Sub-Option B1: Under Option 2, Sub-Option B1, when an overage occurs in both the total ACL and the small-mesh fishery sub-ACL for GB yellowtail flounder, selective trawl gear that reduces the catch of GB yellowtail flounder would be required for vessels using small mesh gear, when fishing in GB yellowtail flounder stock area (gear and area described in Section 4.2.1.2).

Sub-Option B1 would have no substantial social impacts expected from creating this AM, but if this AM is triggered, it could cause a disruption in fishing practices, particularly if the fishery does not pro-actively use gear that reduces GB yellowtail flounder bycatch. Gear modifications affect changes in occupational opportunities, community infrastructure, and *Attitudes, Beliefs and Values*. Gear modifications can compromise business planning for shoreside support services and impose an economic burden on a large number of vessels. The ability to adapt to the new gear regulations would depend on vessels current economic situation and ability to cover the short-term costs of the gear. The magnitude of these impacts will depend on the cost and catch efficiency of the new gear. To the small-mesh fishery, mandatory gear modifications could have more positive social impacts than an area closure. Thus, Sub-Option B may result in more positive impacts than Sub-Option A.

Option 2, Sub-Option B1 could have a positive impact on the *Attitudes, Beliefs and Values,* of the participants in the multispecies fishery, because it could be seen as more fair management of different components of the fishery. This may decrease conflicts, particularly with other components of the fishery that are subject to pound-for-pound paybacks. This could have a positive impact on the *Non-Economic Social Aspects* of the fishery.

Sub-Option B2 (Preferred Alternative): Under Option 2, Sub-Option B2, when an overage occurs in small-mesh fishery sub-ACL for GB yellowtail flounder, selective trawl gear that reduces the catch of GB yellowtail flounder would be required for vessels using small mesh gear, when fishing in the GB yellowtail flounder stock area (gear and area described in Section 4.2.1.2).

Sub-Option B2 would have similar social impacts to those discussed under Option B1. Additional negative impacts are possible, due to the fact that this AM would be implemented regardless of whether or not the total ACL of GB yellowtail flounder is exceeded. This could negatively impact *Values, Attitudes, and Beliefs* regarding flexibility of management if AMs are imposed on the small-mesh fishery when there is no overage on the total ACL, particularly because not all AMs for non-groundfish fisheries are treated this way.

7.5.2.2 Management Measures for US/CA TACs

This section considers changing fishery management measures as necessary to adjust catches of US/CA stocks. More than one option can be selected.

7.5.2.2.1 Option 1: No Action

Option 1 would specify U.S./Canada TACs at the beginning of the fishing year, and no in-season adjustments would be made.

Option 1 could have negative social impacts by reducing the flexibility of fishing vessels. This would particularly affect communities that are more reliant on the EGB stocks (Table 28). There may also be a negative social impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management, because Option 1would not utilize the resource to the full extent approved by U.S./Canada agreements.

7.5.2.2.2 Option 2: Revised In-season Adjustment for US/CA TACs (Preferred Alternative)

Option 2 would allow the Regional Administrator to make in-season adjustments to U.S./Canada TACs. Additional allocation of quota would be consistent with current ABC distribution, including both groundfish and non-groundfish vessels. This authority can only exist for trades made by or before the end of FY2014.

Because of the sunset provision in Option 2, its potential impacts relative to Option 1 may be short-term in nature. Option 2 could have positive social impacts to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management, because Option 2 would make adjustments in as timely a manner as possible to allow vessels to utilize the resource to the full extent approved by U.S./Canada agreements. The potential additional in-season quota may also help maintain the *Historic and Present Participation* in the fishery, particularly for communities more reliant on EGB stocks (Table 28). Depending on how the revised in-season quota is distributed among fisheries (e.g. groundfish and scallops), there could be conflict between fisheries, resulting in negative impacts to the *Non-Economic Social Aspects* of fisheries.

7.5.2.2.3 Option 3: Distribution of US TACs in Eastern/Western Georges Bank (Preferred Alternative)

<u>Sub-Option A</u>: This option would allow the Regional Administrator, in consultation with the Council, to adjust the portion of the U.S. TAC for Eastern GB haddock that is available in the Eastern U.S./Canada Area.

Sub-Option A could have positive social impacts by increasing the flexibility of fishing operations. This would particularly affect communities that are more reliant on EGB haddock (Table 28). There may also be a positive social impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management.

<u>Sub-Option B (Preferred Alternative)</u>: This option would allow a sector or state-operated permit bank to convert its Eastern GB haddock ACE to Western GB haddock ACE to cover overages during the previous fishing year. This conversion may only be made within a sector or permit bank and must be approved by NMFS.

Sub-Option B could have positive social impacts on the *Historical Dependence on and Participation in* the fishery by increasing the flexibility of fishing operations. This would particularly affect communities that are more reliant on EGB haddock (Table 28).

There may also be a positive social impact to the *Attitudes, Beliefs and Values* of fishermen regarding the flexibility of management. Relative to Sub-Option A, Sub-Option B would have more positive impacts on the flexibility of fishing operations.

7.5.2.3 Georges Bank Yellowtail Flounder Management Measures

7.5.2.3.1 Option 1: No Action

Option 1, the No Action alternative, would maintain the status quo measures for GB yellowtail flounder, with regard to how GB yellowtail flounder discards are calculated.

Under Option 1, there would be no new social impacts, as Option 1 continues to use the current method of accounting for discards on unobserved trips.

7.5.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder (Preferred Alternative)

Option 2 would modify the stratification method used for estimating discards of GB yellowtail flounder, such that trips made in Statistical Area 522 would have a different calculated discard rate than the rest of GB.

Under Option 2, the catch and discard rates of GB yellowtail flounder could be lower in SA 522 than the rest of GB, allowing for fishing in SA 522 with a lower risk of exceeding allocations of GB yellowtail flounder. It is important to point out that, because the GB discard rate is calculated based on observed hauls in the GB statistical areas, removing hauls with low yellowtail discards made in one area will inflate the calculated discard rate in the other areas. Removing observed hauls with low yellowtail discards made in SA 522 from the hauls used to determine the GB discard stratum, will increase the yellowtail discard rate assigned to the other GB statistical areas. It is possible that the fishing opportunities gained in SA 522 could occur at a loss in opportunity in the other GB statistical areas, because of higher calculated discard rates.

Compared to the No Action alternative, Option 2 could offer some small but positive social impacts. The perception among fishermen could be that Option 2 would provide some assurance that vessels fishing in SA 522 would not be penalized by the higher discard rates found in other stock areas. This would have a small but positive social impact on the formation of *Attitudes and Beliefs* about government and management. Other potential social impacts of adopting Option 2 are difficult to predict, because they will vary based on the calculated discard rates in SA 522 and the other GB stock areas, as well as based on the distribution of fishing in those areas.

7.5.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

7.5.2.4.1 Option 1: No Action

Under Option 1, there would continue to be no trip limit for yellowtail flounder stocks for vessels in the limited access scallop fishery, and these vessels would continue to be required to land all legal-sized yellowtail flounder.

Under Option 1, the social impacts are expected to be mixed. There may be positive social impacts associated with having no regulatory discards of yellowtail flounder, thereby reducing the negative social impacts commonly associated with the forced discard of marketable fish. However, these could be offset by negative social impacts associated with the perception that limited access scallop vessels are targeting a bycatch species. Incentivizing the scallop fishery to target yellowtail flounder could result in exceeding their sub-ACL, the social consequences of which would exceed any benefits resulting from yellowtail flounder landings.

7.5.2.4.2 Option 2: Prohibition on Possession of Yellowtail Flounder (Preferred Alternative)

Under Option 2, there would be zero possession of yellowtail flounder stocks for vessels in the limited access scallop fishery. These vessels would be prohibited from landing or selling yellowtail flounder.

Under Option 2, the social impacts are expected to be mixed. 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. 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. In this particular case however, there are likely to be positive social impacts associated with the prohibition on possession of yellowtail flounder, as it will remove any incentive for targeting flounders, and therefore any perception that limited access scallop vessels are targeting a bycatch species.

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 48 together with past, present, and reasonably foreseeable future actions that affect the groundfish 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 (May 1, 2014) and 2019.

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

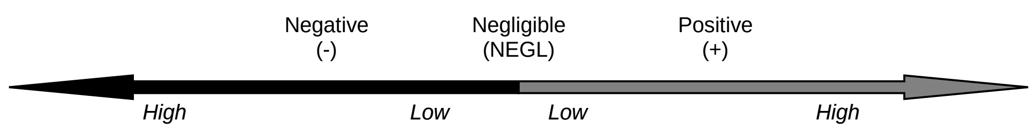
A cumulative effects assessment ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; PLUS (2) the baseline condition for resources and human communities (note – the baseline condition consists of the present 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 71. 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 70.

Table 70- 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 71- 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**	**-**
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**

Actions	Habitat	Regulated Groundfish Stocks	Non-Groundfish Species	Endangered and other Protected Resources	Human Communities
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 -**
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 +**

Noted: ND= Not determined

Table 72 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 72 come from fishery-related activities (e.g., federal fishery management actions – many of which are identified above in Table 71). 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 25 (FW 25) to the Scallop FMP is considering a range of specification alternatives for FY2014 and default measures for FY2015. The Preferred Alternative in that action would include similar allocations and catches to FY2013. The projected catch of GB yellowtail flounder for the Preferred Alternative is higher than the sub-ACL allocated to the scallop fishery in 2014. Therefore, there is a potential risk that the scallop fishery may exceed their sub-ACL and cause the total ACL to be exceeded. FW 25 explains that these bycatch projections are very uncertain, and have been overestimated for the last three years. Furthermore, there are several measures that are expected to help reduce bycatch in the scallop fishery including a seasonal closure of closed area 2, a voluntary bycatch avoidance program, potential gear modifications, and elimination of the requirement to land legal sized YT (being proposed in this action). The total estimate of area swept from these specifications are lower than recent years; therefore, the cumulative impacts of this action on both the groundfish species and groundfish fishery overall are likely negligible.

There may even be potentially positive cumulative impacts on groundfish stocks from FW 25 Preferred Alternatives related to SNE/MA windowpane flounder accountability measures. A proactive gear modification is proposed that would limit the number of rows in the apron of a scallop dredge to seven. Currently vessels are required to have at least seven rows in the apron on the topside of a dredge. Shorter aprons have been found to improve escapement of flatfish. A reactive AM is also proposed that would implement a seasonal gear modified area is all waters west of 71 W, excluding scallop access areas. The gear modification includes a reduced hanging ratio for the twine top on a scallop dredge, and a requirement for an even shorter apron (5 rows). These modifications are expected to reduce windowpane bycatch by about 45%, and about 37% for yellowtail flounder. These 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 72- Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Framework 51.

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 73) 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 72 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 1817.2 and 7.6.1, respectively. As mentioned above, this cumulative effects baseline is then used to assess cumulative effects of the proposed management actions in Table 74.

Table 73- 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 72)	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 73 cont'd.

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 72)	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.
	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 73 cont'd.

VEC	Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 72)	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 51 Actions

The alternatives contained in Framework 51 can be divided into two broad categories, as seen in Table 74 (summary of impacts from action – for a complete discussion of impacts please see Section 7.0 of document). First, this action adjusts the Gulf of Maine cod and American plaice rebuilding strategies and modifies OFLs/ABCs/ACLs by setting specifications for white hake and stocks managed by the U.S./Canada Resource Sharing agreement (Eastern Georges Bank cod, Eastern Georges Bank haddock, and Georges Bank yellowtail flounder). Second, the action adopts commercial fishing measures including measures to establish an accountability measure for the Georges Bank yellowtail flounder sub-ACL in small-mesh fisheries, a mechanism to transfer quota between US and Canada shared stocks, a mechanism to transfer Eastern Georges Bank haddock quota to Western Georges Bank haddock quota, a revised discard strata for Georges Bank yellowtail flounder, and zero possession of yellowtail flounder in the scallop fisheries.

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, and 50 that used available data 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 ACLs identified in FW 51 are thus consistent with the amendment. The proposed revisions to the Gulf of Maine cod and American plaice rebuilding plans are needed to continue the rebuilding of those stocks that was started in Amendment 13, but not completed by 2014 as originally planned.

The second broad category of measures adopted by this action are measures that affect the prosecution of the commercial fishery. Several changes are proposed to modify management measures including to establish an accountability measure for the Georges Bank yellowtail flounder sub-ACL in small-mesh fisheries and zero possession of yellowtail flounder in the scallop fisheries. AMs are established to prevent the sub-ACL of GB yellowtail flounder from being exceeded by small-mesh fisheries. Zero retention in the limited access scallop fishery would eliminate the incentive to target yellowtail flounder. The other measures would establish a mechanism to transfer quota between US and Canada shared stocks, a mechanism to transfer Eastern Georges Bank haddock quota to Western Georges Bank haddock quota, and revise the discard strata for Georges Bank yellowtail flounder, and would allow for more flexibility for the fishing industry.

In general, the adoption of all of these measures will benefit groundfish stocks because collectively they make it more likely that mortality targets are reasonable and will not be exceeded. The measures that constitute the Proposed Action (if based on the Preferred Alternatives) are designed to achieve the rebuilding objectives for the Northeast Multispecies fishery. The most important biological impact of the proposed measures is that they would control fishing mortality on Northeast Multispecies stocks in order to prevent (or end) overfishing and rebuild overfished stocks. The preferred alternative changes to commercial fishery management measures would also contribute to achieving these objectives by providing additional fishing revenues that will benefit both fishermen and their communities. The measures are 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 specifications differ only slightly from the No Action alternative. The ACLs are likely to have negative impacts on communities in the short term, but as stocks rebuild communities should benefit from larger future catches.

Table 74- Summary of Impacts expected on the VECs.

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
UPDATES TO STATUS DETERMINATION CRITERIA, FORMAL REBUILDING PROGRAMS, AND ANNUAL CATCH LIMITS	**REVISED GULF OF MAINE COD REBUILDING PLAN**	**Mixed** – Continues rebuilding of this stock, but progress may be slower than the No Action alternative	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to non-target species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to protected species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to habitat are not anticipated	**Positive** – Overall revenues will increase as stock rebuilds; revised plan allows for some landings from this stock
	REVISED AMERICAN PLAICE REBUILDING PLAN	**Mixed** – Continues rebuilding of this stock, but progress may be slower than the No Action alternative	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to non-target species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to protected species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to habitat are not anticipated	**Positive** – Overall revenues will increase as stock rebuilds; revised plan allows for some landings from this stock
	REVISED OFL/ABCS/ ACLS	**Positive** –. These ABCs, ACLs, and sub-ACLs, and the AMs will impose tighter controls on fishing mortality for these stocks using the best available science. This, combined with past management efforts, should contribute to stock rebuilding and provide positive cumulative impacts	**No Impact/ Neutral –** Provided rebuilding continues, additional impacts to non-target species are not anticipated	**No Impact/ Neutral –** Provided rebuilding continues, additional impacts to protected species are not anticipated	**No Impact/ Neutral –** Provided rebuilding continues, additional impacts to habitat are not anticipated	**Mixed** – While the Preferred Alternative produces more revenues than No Action, reduced ACLs (as compared to recent years) will result in continued reductions in fishing revenues in the short term. Overall revenues will increase as stocks increase.

Table 74 cont'd.

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
COMMERCIAL FISHERY MEASURES	**SMALL- MESH FISHERY ACCOUNTABILITY MEASURES FOR GB YELLOWTAIL FLOUNDER SUB-ACL**	**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
	MANAGEMENT MEASURES FOR US/CA TACS	**No impact** – measures are not expected to create additional impacts to target species	**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	**Positive** – Increasing access to landings will provide additional commercial fishing revenues and recreational opportunities
	GB YELLOWTAIL FLOUNDER MANAGEMENT MEASURES	**No impact** – measures are not expected to create additional impacts to target species	**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	**Positive** – Removing the incentive to target yellowtail flounder reduces the likelihood of the scallop fishery AMs being triggered

	PROHIBITION ON POSSESSION OF YELLOWTAIL FLOUNDER BY THE LIMITED ACCESS SCALLOP FISHERY	**No impact** – measures are not expected to create additional impacts to target species	**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	**Positive** – Landings will provide additional commercial fishing revenues and recreational opportunities

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 74 provides as a summary of likely cumulative effects found in the various groups of management alternatives contained in Framework 51. The CEA baseline that, as described above in Table 73, 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.

<u>Managed Resources</u>

As noted in Table 73, 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 actions proposed by Framework 51 are expected to continue this trend. The adoption of revised rebuilding plans for Gulf of Maine cod and American plaice and the revised ABCs/ACLs will have the largest biological impacts. The revised rebuilding strategies will continue to rebuild Gulf of Maine cod and American plaice, but at a slower pace than the No Action alternative. The revised ABCs/ACLs are designed to meet fishing mortality targets and to promote stock rebuilding. The small-mesh fishery accountability measure for the Georges Bank yellowtail flounder sub-ACL will have similar effects. The other measures – management measures for US/CA TAC, Georges Bank yellowtail flounder management measures, and prohibition on the possession of yellowtail flounder –will likely have no impact. 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 25 to the Scallop FMP on groundfish species are likely negligible and potentially positive for windowpane flounder.

Non-Target Species

As noted in Table 73, 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 actions proposed by Framework 51 are 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 73, 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 actions proposed by Framework 51 are 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 impacts to protected species.

Habitat, Including EFH

As noted in Table 73, 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. None of the fishery specifications measures are 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; however, it is likely that fishing and non-fishing activities will continue to degrade habitat quality.

Human Communities

As noted in Table 73, 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, 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. The specifications for FY 2014 (FW 51) are expected to have long-term positive impacts on human communities as they promote stock rebuilding, but in the short-term, impacts are likely to be negative and significant. Modest increases in ACLs for Georges Bank yellowtail flounder and white hake will likely cause short term mixed impacts on human communities. Modifying the Gulf of Maine cod and American plaice rebuilding plans will provide some benefits to 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 25 to the Scallop FMP on the groundfish fishery are likely 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.

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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 GOM cod and American plaice rebuilding plans and ACLs set controls on catch to ensure that the appropriate fishing mortality rates are implemented. Changes to commercial and recreational fishery measures in Section 4.2 implement and adjust programs to achieve the 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 each of twenty stocks included in the management unit. 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 (American plaice), subsequent benchmark assessments (SARC 55 for GOM cod and SARC 56 for white hake) and the most recent TRAC proceedings (2013). Additionally, the proposed 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. Some of the Preferred Alternatives in fact increase efficiency, such as transfer of GB haddock from EGB, revising the discard strata for GB yellowtail flounder and restricting the possession of yellowtail flounder by the LA scallop fishery. 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 small-mesh fisheries, 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 of low ACLs on certain stocks in order to achieve rebuilding targets. 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 Alternatives, in conjunction with Amendment 16 measures, are 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 specifications 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 and 50. 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 catch limits 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 uses that mechanism to specify ACLs for future fishing years.

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 51 (Northeast Multispecies FMP) Preferred Alternatives is to adopt modifications to management measures that will incorporate new information relative to effective program administration and setting catch levels 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 Alternatives are described in Section 4.0. The alternatives include the following general measures:

- A revised rebuilding strategy for GOM cod
- A revised rebuilding strategy for American plaice
- Updated TACs for stocks managed consistent with the U.S./Canada Resource Sharing Understanding
- Revised ACL specifications for white hake and GB yellowtail flounder FY 2014 – FY 2016
- Small-mesh fishery AMs for GB yellowtail flounder
- Management measures for US/CA TACs
- GB yellowtail flounder management measures
- Prohibition on the possession of yellowtail flounder by the LA scallop 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 Alternatives. Nearly all measures are expected to have neutral impacts on habitat.

Measures with Potential Negative Effects on EFH

Extending the GOM cod and American plaice rebuilding plans may result in a small increase in the number of groundfish fishing trips in the stock areas when compared to No Action. This increase in effort may result in a small increase in the adverse effects of fishing on EFH in this area.

Measures with Potential Positive Effects on EFH

The revised ACLs that are the preferred alternative may benefit EFH by reducing fishing effort in a broad area when compared to recent fishing activity. As shown by the economic analysis, the number of days fished is expected to decline when compared to either FY 2012 or FY 2013. These reduced effects on EFH would be expected to continue for several years, but as stocks rebuild fishing effort may increase.

Table 75- Summary of possible effects to EFH as a result of the Preferred Alternatives

	Preferred Alternative
Possible negative impacts	Revised rebuilding strategy for GOM cod
	Revised rebuilding strategy for American plaice; Management Measures for US/CA TACs
Neutral Impacts	Revised Discard Strata for GB Yellowtail Flounder
Possible Positive Impacts	Annual Catch Limits; Small-Mesh Fishery AMs; Prohibition on possession of yellowtail flounder
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 Alternatives are unlikely to have noticeable impacts on EFH; there may be slight 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 nine 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 catch limits or 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. The Preferred Alternatives will probably result in declines in overall groundfish fishing effort because of the reductions in many ACLs from FY 2013 levels. 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 option 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 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 Alternatives. As described in Section 7.1.1, the catch limits in this action are designed to continue rebuilding. 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). The proposed catch limits are expected to result in gross groundfish revenues for FY2014 are predicted to be just over $55 million and all gross revenues on groundfish trips are predicted to be just under $71 million. This represents approximately a 26% reduction in all gross revenues on groundfish trips relative to FY2012 and a 4% reduction relative to those predicted in FY2013. On a home-port state level, New Hampshire is expected to have the largest percentage decline (32%) in gross revenues from groundfish relative to FY2012. Rhode Island is expected to be the least affected by these ACLs, with a small 7% predicted increase in gross groundfish revenues relative to FY2012. For major home-ports, Gloucester, MA is expected to have the largest percentage decline (33%) in gross revenue and New Bedford, MA is expected to be the least affected, with a 5% decline in gross groundfish revenues predicted.

While these declines in revenues are substantial, because they are less than $100 million they are not considered significant under the criteria used for E.O. 12866. The Preferred Alternatives, however, may place small entities (defined as those generating less than $500K in annual sales) at a competitive disadvantage relative to large entities, particularly for vessels participating in the commercial groundfish fishery (8.11).

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 51 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.

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

Response: Some aspects concerning the science used to formulate the preferred alternatives on the quality of human environment are expected to be controversial. There is controversy over the scientific evaluation of current stock status that is used to determine future catches. This is particularly the case for GOM cod.

The GOM cod stock has been assessed three times since 2008: in 2008 (GARM III), in 2011 (SARC 53) and in 2012 (SARC 55). The SARC 53 assessment found that stock size was over-estimated at GARM III and concluded that the stock was overfished and overfishing was occurring, when the expectation after GARM III was that the stock would be rebuilt by 2012. In addition, in order to end overfishing, the assessment concluded that large catch reductions were needed in 2012. This assessment result was unexpected and led to a decision to repeat the assessment in 2012.

The 2012 GOM cod assessment review panel forwarded two assessment models for use in developing management advice. The two models differ in their assumption on natural mortality. One model is based on a fixed natural mortality rate while the other reflects an increase in natural mortality in recent years. Under either model, overfishing is occurring and the stock is overfished. There remains some question about the choice of reference points (fishing mortality and biomass) for the model that is based on an increase in natural mortality. While the status of the stock probably would not change, different reference points may lead to different short-term catch advice.

Another area of controversy is the concern that the economic impact analyses understate the true negative impacts of the low ACLs that are the preferred alternative. Many of the complaints focus on the analyses of fishing costs and the effects of costs associated with sectors on the profitability of individual fishing businesses. This may be the case, but there are data limitations and data confidentiality restrictions that inhibit the ability to analyze and describe impacts in more detail. For example, within sectors there is often a redistribution of ACE from one vessel to another, but there is no data on the costs associated with those exchanges – only leases of ACE between sectors are reported. In any case, the economic impact analyses do indicate that the consequences for fishermen and communities are likely to be severe because of declines in revenues as a result of the reduced ACLs.

(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 and initiated stock rebuilding. 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. The economic impacts will clearly be negative and may affect the ability of many fishermen to remain in business.

(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, and FW 50. 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. 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 Alternatives, 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 Alternatives 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 51 to the Northeast Multispecies Fishery Management Plan, it is hereby determined that Framework Adjustment 51 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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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 June 2013 through December 2013 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Date	Meeting Type	Location
6/18-20/13	Council Meeting	Portland, ME
8/14/13	Oversight Committee Meeting	Holiday Inn, Peabody, MA
8/26/13	Groundfish PDT	Radisson, Plymouth, MA
9/16/13	Groundfish Advisory Panel Meeting	Holiday Inn, Portsmouth, NH
9/17/13	Oversight Committee Meeting	Holiday Inn, Portsmouth, NH
9/24-9/26/13	Council Meeting	Cape Codder Hotel, Hyannis, MA
10/28/13	Groundfish PDT Meeting	NMFS Office, Gloucester, MA
11/18-19/13	Oversight Committee Meeting	Newport Marriott, Newport, RI
11/20/13	Council Meeting	Newport Marriott, Newport, RI
12/9/13	Oversight Committee Meeting	Omni Hotel, Providence, RI
12/16-18/13	Council Meeting	DoubleTree by Hilton, Danvers, MA

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 51.

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 multistage 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 Alternatives were conducted using information from the most recent complete calendar years, through 2011, and in some cases includes information that was collected during the first eight months of calendar year 2012. Complete data were not available for calendar year 2012. 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 51. 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 51 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 51 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 FW51 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 producer surplus only, namely the impacted fishing businesses. Given the large supply of domestic and foreign seafood imports consumer surplus is not expected to be affected by any of the regulatory changes proposed in FW51.

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

8.11.1.4.1.1 Revised Gulf of Maine Cod Rebuilding Strategy

A detailed description of this alternative can be found in Section 4.1.1 of this document.

8.11.1.4.1.1.1 Option 1: No Action

This option could result in no change in net economic impacts for 2014, but the resulting quota reductions for 2015 could cause severe disruptions to the groundfish fishery in the GOM stock area. Cod is a primary component of the multispecies catch in this region, and a quota set at or near levels consistent with “incidental bycatch” would impede the harvest of every groundfish stock. Commercial catches in the GOM would fall to trivial levels, resulting in a reduction of revenues that likely would approach 100% of those observed in FY2014. However, a zero-possession restriction could be imposed on cod in the GOM, thereby allowing fisherman to target other stocks while discarding cod. Such a restriction is unlikely to meet MSA requirements, but would dramatically decrease the economic costs associated with this Option.

Recreational fisheries would also experience significant economic losses, though these fisheries are perhaps better able to target stocks other than cod in the GOM. Economic losses for recreational fisheries may instead approach 50-80% reductions from FY2014 levels.

8.11.1.4.1.1.2 Option 2: Revised Rebuilding Strategy for Gulf of Maine Cod (Preferred Alternative)

A detailed net present value (NPV) analysis of estimated future landings under different target mortality rates for GOM cod is presented in Section 7.4.1.1.2 of this document. The Magnusson-Stevens Act (MSA) stipulates that rebuilding plans for fisheries deemed to be overfished are not to exceed 10 years unless biological, environmental, or international management constraints are prohibitive of such a timeframe (Section 304(e)(4)(A)(ii)).

Two options are being considered for a revised rebuilding strategy for GOM cod. Both rebuilding options assume no changes to the FY2014-2015 ABC (1,550 mt) that was previously recommended by the SSC, and adopted by FW 50.

NPVs are of GOM cod landings alone and do not take into account potential revenue losses or gains from the sale of other stocks of groundfish. A simple linear regression was used to calculate an average price based on price and quantity relationships for GOM cod from 1996 –

2011 (Figure 30). The resulting prices were then applied to the anticipated ACLs under the various scenarios (Table 63).

Given the assumptions of full use of ACLs and perfect realization of predicted ACLs through 2024, the results indicate that under the Base Case model, a 10-year rebuilding plan (Sub-Option B) would maximize net present value relative to an 8-year rebuilding plan (Sub-Option A). Under the M-Ramp model, there is little discernable difference between the two sub-options. Either sub-option is preferable to the No Action option which would likely yield very little economic benefits.

8.11.1.4.1.1.3 Option 3: Rebuilding Plan Review Analysis for Gulf of Maine Cod (Preferred Alternative)

This sub-Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

8.11.1.4.1.2 Revised American Plaice Rebuilding Strategy

A detailed description of this alternative can be found in Section 4.1.2 of this document.

8.11.1.4.1.2.1 Option 1: No Action

This option would result in no change in net economic impacts for FY2014, but the anticipated quota reductions for FY2015 would result in severe disruptions to the groundfish fishery across all stock areas. American plaice is sometimes referred to as a “unit stock” species, meaning that it does not have multiple stocks within the management unit. As such, a low or de minimis allocation will result in loss of groundfish fishing opportunities coast-wide. The FY2012 value of groundfish catch was approximately $69 million in 2012 dollars. FY2014 revenues would be consistent with ACLs specified elsewhere in this document, and would be unaffected by this option, but FY2015 groundfish revenues would likely approach zero without other future changes to the management regulations, such as a zero possession restriction imposed on the fishery.

Recreational fisheries would be unaffected by this option, as there is no directed recreational fishery, and no recreational sub-allocation, for American plaice.

8.11.1.4.1.2.2 Option 2: Revised Rebuilding Strategy for American Plaice (Preferred Alternative)

Three options are being considered for a revised rebuilding strategy for American plaice. All three rebuilding options assume no changes to the FY2014-2015 ABCs that were previously recommended by the SSC, and adopted by FW 50.

The NPV analysis translates the potential landing streams into future revenues, discounted as appropriate, by applying an average price to potential American plaice landings. Implicitly, again, this analysis assumes that all allocated fish are caught and a 10% discard rate is applied in all years to estimate landings. NPVs are of American plaice landings alone and do not take into account potential revenue losses or gains from the sale of other stocks of groundfish.

American plaice demonstrates a demand function where price is inelastic with respect to quantity (i.e., demands changes little due to price). As such, a constant average price is applied to all landings and this price is applied to the anticipated ACLs under the various scenarios.

Given the assumptions of full utilization of ACLs and perfect realization of predicted ACLs through 2024, the results indicate that there is little discernable difference between the three sub-options. The sub-options are generally preferable to the No Action option, since the No Action option yields very little economic benefits.

8.11.1.4.1.2.3 Option 3: Rebuilding Plan Review Analysis for American Plaice (Preferred Alternative)

This sub-Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

8.11.1.4.1.3 Annual Catch Limits

A detailed description of this alternative can be found in Section 4.1.2 of this document.

8.11.1.4.1.3.1 Option 1: No Action

By selecting Option 1, ACLs will be based on FW50 specifications for the years 2013-2014, which have missing values for many species. Specifically, GB East cod and haddock, GB yellowtail flounder, and white hake would have no ACLs. Fishing would not be permitted for these species, nor would fishing be allowed in these species' broad stock areas. The portion of the GB East cod and haddock ACLs that would ordinarily be allocated to the eastern GB area would instead be allocated the western GB stock area, and consequently the ACLs for GB West cod and haddock are higher under the No Action option than under Option 2.

As the white hake stock area encompasses the geographic range of the management unit, the adoption of the No Action option would almost certainly lead to a complete shut-down of the groundfish fishery, bringing fishery-wide commercial groundfish revenues to zero.

Impacts on the recreational fishery are less certain. There is no recreational fishery in the eastern GB stock area, and no recreational sub-allocation for GB yellowtail flounder or white hake. It seems likely that the recreational fishery would not be significantly impacted by the adoption of the No Action alternative. Sub-allocations for other recreational stocks (GOM cod, haddock) are similar to those from FY2013 and no measures are proposed in this framework action that would alter the administration of this fishery.

The precise impacts of the No Action option on the scallop fishery are unclear. This option does not identify a scallop fishery sub-ACL for GB yellowtail flounder. While this would not prevent the scallop fishery from fishing in FY2014, it is not clear if the absence of a sub-ACL would be treated as if the sub-ACL was zero. If this were the case, then catches would lead to scallop fishery AMs being triggered in FY2015 and/or later years. As a result, this option would result in large reductions in scallop fishery revenues relative to Option 2. But if this is not the case, and the scallop fishery catches do not trigger AMs, then this option might allow for greater scallop fishery revenues than would be the case if AMs are triggered using the sub-ACL specified in Option 2.

8.11.1.4.1.3.2 Option 2: Revised Annual Catch Limit Specifications (Preferred Alternative)

Under Option 2, gross groundfish revenues for FY2014 are predicted to be just over $55 million and all gross revenues on groundfish trips are predicted to be just under $71 million, as estimated under the Quota Change Model (QCM). This represents approximately a 26% reduction in all gross revenues on groundfish trips relative to FY2012 and a 4% reduction relative to those predicted in FY2013 (Table 68). On a home-port state level, New Hampshire is expected to have the largest percentage decline (32%) in gross revenues from groundfish relative to FY2012. Rhode Island is expected to be the least affected by these ACLs, with a small 7% predicted increase in gross groundfish revenues relative to FY2012. For major home-ports, Gloucester, MA is expected to have the largest percentage decline (33%) in gross revenue and New Bedford, MA is expected to be the least affected, with a 5% decline in gross groundfish revenues predicted.

The impacts to gross revenues are expected to be distributed non-uniformly across different vessel length categories as well, with the 30-50 foot category experiencing the largest drop in gross revenue compared to FY2012, with a predicted 35% reduction. Larger vessel classes are predicted to experience smaller declines in gross revenues, with the largest vessel size class (75+ ft.) predicted to see a 10% decline in gross revenues. This result is not surprising, as small vessels have less scalability in terms of landings and have a smaller geographic range. Net revenues, as opposed to gross revenues, are expected to decline much less substantially as lower allocations drive fisherman to fish as efficiently as possible. The relatively large decline in predicted trip costs (fuel, ice, food, etc.) reflects an anticipated actual reduction, but most likely over-estimates the efficiency gains that will be possible in FY2014. Predicted trip costs for FY2013 are substantially lower than those predicted for FY2014 despite a similar number of trips, days absent, etc. This is in part a function of the optimization component of the QCM, which selects the most profitable trips (often the lowest-cost trips) disproportionately, but may also be signaling a trend in rising trip costs.

FY2014 is predicted to see a 21% decline in net revenues relative to FY2012 and a 12% decline relative to predicted net revenues for FY2013. Crew-days, days absent and total sector trips are all predicted to decline substantially relative to FY2012, as the model predicts only the most efficient trips will occur under continued restrictive quota allocations (Table 68). This represents fewer earning opportunities for crew members, and may signal reductions in incomes for down-stream fishing businesses such as fish dealers, ice houses, gear shops, and shipyards.

If the scallop fishery triggers the GB yellowtail flounder AMs, Option 2 would likely reduce scallop fishery revenues. However how this reduction in revenue compares to the Option 1/No Action is unclear. The No Action does not identify a scallop fishery sub-ACL for GB yellowtail flounder. While this would not prevent the scallop fishery from fishing in FY2014, it is not clear if the absence of a sub-ACL would be treated as if the sub-ACL was zero. If this were the case, then catches would lead to scallop fishery AMs being triggered in FY2015 and/or later years. As a result, No Action/Option 1 would result in large reductions in scallop fishery revenues relative to Option 2. But if this is not the case, and the scallop fishery catches do not trigger AMs, then Option 1/No Action might allow for greater scallop fishery revenues than would be the case if AMs are triggered using the sub-ACL specified in Option 2.

8.11.1.4.2 Commercial and Recreational Fishery Measures

8.11.1.4.2.1 Small-Mesh Fishery Accountability Measures

A detailed description of this alternative can be found in Section 4.2.1 of this document.

8.11.1.4.2.1.1 Option 1: No Action

This option would not establish additional accountability measures (AMs) for the small-mesh fishery for Georges Bank yellowtail flounder under the Multispecies FMP. FW 48 adopted a sub-ACL of GB yellowtail flounder beginning in FY2013. If the U.S. TAC (equal to the U.S. ABC) for GB yellowtail flounder is exceeded, the U.S./Canada Resource Sharing Understanding requires that the U.S. TAC for the following fishing year be reduced by the amount of the overage. Option 1 would not change the existing regulatory requirements for the small-mesh bottom-trawl fishery. No new economic impacts are expected.

8.11.1.4.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL (Preferred Alternative)

Two options (one with two sub-options) are being considered for the small-mesh fishery AM.

Compared to No Action/Option1, by reducing the GB yellowtail flounder bycatch discards in the small-mesh fishery, it is less likely that overfishing will occur in these areas and catch rates of groundfish trips may increase slightly for groundfish vessels. This may result in higher net revenue for Sub-Options A, B1, and B2 relative to No Action. In addition, groundfish sub-ACLs could be increased slightly as a result of reduced discards.

Relative to the No Action/Option 1, by closing the GB yellowtail flounder stock area to small-mesh fisheries when the AM was triggered under Option A, fishing would be displaced out of that area which could also displace revenue and increase costs. Small-mesh fishing effort would likely increase in the next best place to fish, potentially lowering catch rates of target stocks and increasing associated costs.

Information in revenue and landings from the Longfin squid and whiting fisheries within the GB yellowtail flounder stock area and adjacent areas can be found in Section 6.5.11.

Relative to the No Action/Option1 and Option A, the small-mesh fishermen would likely experience higher costs including the fixed cost of purchasing new gear/modifying existing gear under Sub-Options B1 and B2. Their operating costs would probably increase due to the gear restrictions (lower catch rates), effectively lowering their net revenue and overall profitability.

8.11.1.4.2.2 Management Measures for US/CA TACs

A detailed description of this alternative can be found in Section 4.2.2 of this document.

8.11.1.4.2.2.1 Option 1: No Action

This option would not change existing fishery regulations and would have no new economic impacts.

8.11.1.4.2.2.2 Option 2: Revised In-Season Adjustment for US/CA TACs (Preferred Alternative)

Option 2 is not expected to alter, in the short term, the aggregate amount of GB haddock caught by in the groundfish fishery. Catch is persistently less than allocation for both the eastern and western stocks of GB haddock. Option 2 is expected to have no additional economic impacts, positive or negative, relative to Option 1. Further, it is not known at this time if this option would increase or decrease quota allocated to groundfish fishermen. However, if the ability to alter quotas in season were to result in increased quota for sector and/or common pool fishermen, and if that quota were to be converted into landings, then Option 2 could be viewed as economically beneficial.

8.11.1.4.2.2.3 Option 3: Revised In-Season Adjustment for US/CA TACs (Preferred Alternative)

Two sub-Options are presented (A and B). Both are administrative in nature, and do not propose any particular quota adjustment. To the extent that they better allow the Regional Administrator to increase the flexibility of fishing operations on Georges Bank, they should be considered economically beneficial.

8.11.1.4.2.3 Georges Bank Yellowtail Flounder Management Measures
8.11.1.4.2.3.1 Option 1: No Action

Under Option 1, there would be no changes to the management measures for GB yellowtail flounder for estimating discards. Option 1 would neither change the current discard rates used for GB yellowtail flounder quota monitoring nor the existing regulatory requirements for the small-mesh bottom-trawl fishery. This option not change the way the fishery currently operates, and will have no new economic impacts.

8.11.1.4.2.3.2 Option 2: Revised Discard Strata for GB Yellowtail flounder

There are a number of potential economic impacts associated with this option. If the discard rate is lowered in area 522, vessels fishing in that area will be able to expend less GB yellowtail flounder quota on each trip, increasing net revenues by allowing for more fishing. This is expected to have the largest effect on trawl vessels, since they are the vessels that predominantly fish in area 522. If area 522 is removed from the discard rate calculation for other areas, the discard rate for other areas would likely be higher than in the past (Section 7.1.2.3.2). This will represent decreased net revenues to vessels fishing in those areas, because the opportunity cost of quota will likely increase. If area 522 becomes relatively more profitable to fish in than the other statistical areas, there could be a shift in spatial effort to area 522 by other trawl vessels. This could have unforeseen impacts on area-specific fishing levels, which could have negative long-term MSY consequences.

8.11.1.4.2.4 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

8.11.1.4.2.4.1 Option 1: No Action

This option maintains the requirement for limited access scallop vessels to land all legal sized yellowtail flounder catch for each trip. The groundfish fishery is not directly impacted as long as scallop vessels do not target yellowtail flounder as a result of this measure and increase overall mortality on yellowtail flounder. In addition, more precise accounting of yellowtail flounder catch in the limited access scallop fishery may over the long term improve the accuracy of the yellowtail flounder stock assessments with commensurate benefits accruing to vessels participating in both the sector and common pool groundfish fisheries.

If some yellowtail flounder vessels are targeting yellowtail flounder as a result of the current requirement to retain all legal sized yellowtail flounder, that could have potentially negative impacts on the overall scallop fishery if it increases yellowtail flounder catch and causes the ACL to be exceeded, triggering AMs for the scallop fishery. A limited number of limited access vessel that are landing yellowtail flounder will lose some income, but the majority of limited access vessels are not landing yellowtail flounder, and it is a small fraction of total revenue so impacts are very limited.

8.11.1.4.2.4.2 Option 2: Prohibition on Possession of Yellowtail Flounder (Preferred Alternative)

This option requires limited access scallop vessels to discard all yellowtail flounder caught while fishing under the Atlantic sea scallop FMP. The groundfish fishery is not directly impacted. Accurate catch information is necessary for accurate stock assessments, and the groundfish fishery is impacted in the medium to long term by the accuracy and stability of three separate stock assessments: southern New England yellowtail flounder, Georges Bank yellowtail flounder, and the annual Trans-boundary Resource Sharing Agreement shared-stock yellowtail flounder assessment. This option will influence both true removals and removal estimate accuracy for the yellowtail flounder caught in the limited access scallop fishery. If true removals remain below the sub-allocation for the fishery, this option will have a positive medium and long-term effect on vessels participating in both the sector and common pool groundfish fisheries.

In a general sense, all mandatory discard programs create economic losses as potentially valuable landings are converted into discards. In this case, those losses accrue to the scallop fishery and are not shared by the groundfish fishery. The Atlantic sea scallop fishery is restricted by a sub-allocation of yellowtail flounder which is designed to limit yellowtail flounder mortality in the scallop fishery. Accurately accounting for yellowtail mortality in this fishery is dependent upon accurate discard observations and/or estimates. To the extent that sampling observations form a valid basis for population-level estimates (i.e. discard rates are consistent across both the sampled and unsampled populations) a sufficient level of sampling should enable accurate estimates of aggregate yellowtail flounder removals in this fishery, and therefore will have a positive medium and long-term economic impact on the groundfish fishery.

If, however, representativeness assumptions necessary to scale from sampling units to populations are violated, removal estimates may be inaccurate. The primary driver for inaccuracy in this case would be increased discard rates on unobserved scallop fishing trips. Additionally, this option may not provide as strong an incentive to avoid yellowtail flounder catch as Option 1/No Action. If either, or both, of these factors result in the limited access scallop fishery exceeding their sub-allocation of yellowtail flounder, and this results in delayed stock rebuilding, the groundfish fishery will face direct medium-term economic losses from foregone potential catch. If these factors lead to inaccurate removal estimates for this fishery, the accuracy and/or stability of yellowtail flounder stock assessments may degrade in the medium to long term, with commensurate negative effects on vessels participating in both the sector and common pool groundfish fisheries.

Relative to Alternative 1/No Action, the requirement to land all legal sized yellowtail flounder under Groundfish FW44 was expected to reduce discards of yellowtail flounder and improve estimates of scallop fishery catches of yellowtail, to the extent vessels complied with the requirement. Based on observer data from 2011-2013, it does not appear that discards have been reduced substantially because the majority of legal sized yellowtail flounder is still being discarded. In addition, if most legal sized yellowtail flounder are still being discarded, the overall estimates of scallop fishery catches have likely not improved as a result of this requirement. If compliance improves, some of these potential benefits may be more realized.

If scallop vessels are prohibited from retaining and landing yellowtail flounder there could be some economic loss for vessels that have been landings yellowtail flounders. Only a relatively small proportion of the limited access fishery is currently landing YT, about 60-80 vessels depending on the year. The number of vessels landing yellowtail flounder does seem to have increased since the requirement to land legal sized yellowtail flounder went into effect in May 2010, but the majority of limited access vessels do not land yellowtail flounder. Total yellowtail flounder landings increased in 2011, but declined again in 2012 and 2013. Average revenue per vessel that has landed yellowtail flounder is about $2,000-6,000 dollars, or less than 5% of total revenue. Therefore, the impact of zero possession would only impact a relatively small proportion of the fishery, and impacts would be expected to be small since yellowtail flounder landings revenue is a very small percentage of total revenue for these vessels.

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. Adverse economic impacts will result from this proposed action throughout the range of the groundfish fishery, including reduced income and employment opportunities. These impacts are estimated to be most significant for smaller vessels fishing in the inshore GOM, though all vessels are predicted to see increases in operating costs as it becomes more difficult to selectively target stocks with abundant quota while avoiding quota-constrained stocks. ACE trading and leasing will mitigate some of the adverse effects, and these transfer payments are expected to flow from larger vessels to smaller vessels, particularly those hailing from inshore Gulf of Maine ports. The potential decrease in gross revenues from fishing on sector trips under this action is estimated to be $25 million from the FY 2012 observed revenues, falling short of the $100 million standard for significance. The only scenario that could come close to the $100 million mark would be under the No Action alternative where no new ACLs are set for selected and fishing for those species is prohibited entirely. Since total predicted gross revenues on groundfish trips for 2014 are below $100 million, and since much of the industry capitalization could be recovered through the sale or repurposing of assets, it is unlikely that the total pecuniary impact would surpass the threshold of significance as defined by E.O. 12866, even under such dire circumstances. A total shutdown could however impact local fishing communities in a material way, through job reductions and loss of local expenditures as well as damage to cultural heritage. If such a circumstance were to come to pass, it would then be classified as significant under E.O. 12866, but the No Action Alternative is not the proposed action.

8.11.2 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 51 are the same as those detailed in Amendment 16 to the Northeast Multispecies Fishery FMP. In general, FW 51 is intended to modify catch limits and management measures to ensure that overfishing does not occur, while at the same time achieving optimal yield (OY).

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

The Small Business Administration (SBA) defines a small business as one that is:

- independently owned and operated
- not dominant in its field of operation
- has annual receipts not in excess of -
  - $19.0 million in the case of commercial finfish harvesting entities (NAIC[10] 114111),
  - $5.0 million in the case of commercial shellfish harvesting entities (NAIC 114112), or
  - $7.0 million in the case of for-hire fishing entities (NAIC 487210)
- or if it has fewer than -
  - 500 employees in the case of fish processors, or
  - 100 employees in the case of fish dealers.

This proposed rule impacts commercial and recreational fish harvesting entities engaged in the Northeast multispecies limited access and open access fisheries, the small-mesh multispecies and squid fisheries, and the scallop 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 Harvesting Entities

Limited Access Northeast Multispecies harvesting permits
The limited access groundfish[11] 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 permits select to remain in the common pool

[10] The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.
[11] The species managed under the Northeast multispecies FMP are commonly referred to as groundfish.

fishery as a result of low catch histories and in turn, low Potential Sector Contributions (PSC) for groundfish stocks.

As of January 14, 2014 (fishing year 2013) there were 1,088 individual limited access permits[12]. 664 of these permits were enrolled in the sector program and 424 were in the common pool. Each of these permits will be eligible to join a sector or enroll in the common pool in fishing year 2014. Alternatively each permit owner could also allow their permit to expire by failing to renew it. Of the 1,088 limited access multispecies permits issued in FY2013, 767 have landings of any species and 414 have groundfish landings.

Open Access Northeast Multispecies harvesting permits

Open access permits can be requested at any time, with the limitation that a vessel cannot have a limited access and open access permit concurrently. No qualification criteria are required for these permits. Permits categories included in this group are HB, I, J and K.

Category I permits are charter/party permits which are discussed separately under regulated recreational fish harvesting entities. Category J permits are scallop multispecies possession permits. Impacts to these vessels will be captured under the discussion of the limited access Atlantic sea scallop harvesting entities. Category K permits are non-regulated multi-species permits and are impacted by the proposed action by way of the small-mesh multispecies (whiting) fishery regulations. Permit category HB is a rod and reel handgear permit that must adhere to specified possession limits for groundfish species with special provisions for cod. The cod possession limit for HB permits is set annually to 75 pounds per trip and is automatically adjusted relative to the GOM cod limited access possession limit as specified in Amendment 13. The current possession limit is 75 pounds. As of February 18, 2014 (Fishing Year 2013) there were 891 HB permits and 78 of those vessels landed groundfish.

Limited Access Atlantic Sea Scallop harvesting permits

The limited access scallop fisheries are further sub-classified as Limited Access (LA) scallop permits and Limited Access General Category (LGC) scallop permits. LA scallop permit businesses are subject to a mixture of days-at-sea (DAS) and dedicated area trip restrictions. LGC scallop permit businesses are able to acquire and trade LGC scallop quota and there is an annual cap on quota/landings. The proposed action would not alter the regulations for LGC permit holders. As of February 19, 2014 (Fishing Year 2013) there were 348 active LA scallop permits with at least one dollar of revenue from sea scallops.

Small Mesh Multispecies (whiting) harvesting permits

The small mesh exempted fishery allows vessels to harvest species in designated areas using mesh sizes smaller than the minimum mesh size required by Regulated Mesh Area (RMA) regulations. To participate in the small-mesh multispecies (whiting) fishery exemptions, vessels must hold either a limited access multispecies permit (categories A-F) or an open access multispecies permit (category K). Limited access multispecies permit holders can only target whiting when not fishing under a DAS and while declared out of the fishery using VMS. A description of limited access multispecies permits was provided above. As of

[12] 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.

February 18, 2014 (Fishing Year 2013) there were 776 open access category K multispecies permits issued, with only 34 of them landing whiting. Many of these vessels target both whiting and Loligo squid on small-mesh trips taken in the GBYTFS stock area and therefore most of them also have open access or limited access Squid, Mackerel, and Butterfish (SMB) permits. For the trips that catch whiting or squid in the GBYTF stock area, revenues from whiting and squid combined make up the majority of trip revenues as discussed in Section 6.5.11. The GBYTF stock area provided almost half of total whiting landings in CY2010-2011. Since squid landings in the GBYTF stock area comprised less than 10% of overall squid landings during the same time period and since most SMB permitted vessels fishing in the GBYTF stock area will also have a multispecies permit, SMB permits will not be handled separately in this analysis.

Regulated Recreational Fish Harvesting Entities

Party/charter permits are issued as an open access category I permit under the Northeast Multispecies FMP and are subject to recreational management measures. As of February 20, 2014 (Fishing Year 2013) there were 667 party/charter permits issued, 383 of which reported taking a party or charter trip. 120 of the active party or charter vessels caught cod or haddock in the Gulf of Maine in 2013. A more detailed description of the recreational harvesting component can be found in Section 6.5.9.3 of this document.

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 2012 permits and contains average gross sales associated with those permits for calendar years 2010 through 2012.

Matching the potentially impacted permits described above (Fishing Year 2013) to the calendar year 2012 ownership data, results in 2,064 distinct ownership entities. Of these, 2,042 are categorized as small and 22 are categorized as large entities per the SBA guidelines (Table 76 and Table 77).

Table 76- Description of regulated entities by business type and size

Business Type	Small	Large	Total
Charter	439	0	439
Finfish	943	0	943
Shellfish	660	22	682
Total	2,042	22	2,064

* 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 77 - Description of regulated entities by gross sales

Sales	Number of entities	Number of large businesses	Average number of permits owned per entity	Maximum permits per entity	Median gross sales per entity	Mean gross sales per entity
0	319	0	1.1	30	0	0
<$50K	700	0	1.1	6	$8,342	$13,794
$50-100K	183	0	1.1	4	$70,856	$73,107
$100-500K	511	0	1.2	5	$208,124	$236,269
$500K-1mil	117	0	1.5	5	$714,764	$712,794
$1-4mil	202	0	1.6	6	$1,625,189	$1,806,804
$4mil+	32	22	7.3	28	$6,522,943	$9,414,703
Total ownership entities	*2064*					

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[13]. Using this threshold, we find that 151 entities are groundfish-dependent, all of which are small and all of which are finfish commercial harvesting businesses (Table 78). Of the 151 groundfish-dependent entities, 130 have some level of participation in the sector program and 21 operate exclusively in the common pool. There are 234 regulated entities which are scallop-dependent. All of these are shellfish businesses, and 20 are considered large (Table 79). There are 35 small-mesh fishery-dependent[14] entities identified; 19 of them are finfish businesses, 16 of them are shellfish businesses and

[13] 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.
[14] Greater than 50% of gross sales are derived from combined squid and whiting landings.

all of them are considered small. The small-mesh fishery-dependent entities described in Table 80 may overestimate the number of impacted entities since missing statistical area information in the commercial dealer database makes it difficult to track whiting and squid landings that occurred exclusively in the GBYTF stock area. Finally, a description of gross sales for party/charter fishing businesses is presented in Table 81 and includes all entities that earned one dollar or more from for-hire fees.

Table 78 - Description of groundfish-dependent entities regulated by the Proposed Action

Sales	Number of entities	Number of large businesses	Average number of permits owned per entity	Maximum permits per entity	Median gross sales per entity	Mean gross sales per entity	Median groundfish sales per entity	Mean groundfish sales per entity
<$50K	24	0	1.0	1	$5,903	$15,248	$5,056	$11,409
$50-100K	8	0	1.6	4	$79,889	$79,272	$52,968	$56,152
$100-500K	74	0	1.5	5	$222,610	$255,896	$176,416	$201,620
$500K-1mil	22	0	2.0	5	$790,229	$789,068	$588,679	$592,902
$1-4mil	22	0	2.4	6	$1,489,786	$1,684,026	$1,234,031	$1,401,008
$4mil+	1	0	7.0	7	$4,406,227	$4,406,227	$2,379,189	$2,379,189
Total ownership entities	*151*							

Table 79 - Description of scallop-dependent entities regulated by the Proposed Action

Sales	Number of entities	Number of large businesses	Average number of permits owned per entity	Maximum permits per entity	Median gross sales per entity	Mean gross sales per entity	Median scallop sales per entity	Mean scallop sales per entity
<$50K	11	0	1.1	2	$14,021	$17,936	$12,356	$16,525
$50-100K	4	0	1.0	1	$75,532	$77,791	$67,819	$68,032
$100-500K	37	0	1.3	3	$252,677	$277,280	$191,023	$245,970
$500K-1mil	18	0	1.4	3	$616,058	$630,185	$483,365	$504,651
$1-4mil	138	0	1.3	4	$1,676,832	$1,872,829	$1,641,737	$1,822,986
$4mil+	26	20	7.9	28	$6,793,051	$10,100,000	$6,557,615	$9,064,929
Total ownership entities	*234*							

Table 80 - Description of small-mesh fishery-dependent entities regulated by the Proposed Action

Sales	Number of entities	Number of large businesses	Average number of permits owned per entity	Maximum permits per entity	Median gross sales per entity	Mean gross sales per entity	Mean whiting sales per entity	Mean squid sales per entity
<$50K	2	0	1.5	2	$4,118	$4,118	$1,557	$1,739
$50-100K	3	0	1.0	1	$76,422	$77,112	$1,585	$46,883
$100-500K	10	0	1.0	1	$282,142	$264,707	$35,232	$133,098
$500K-1mil	12	0	1.0	1	$670,874	$711,327	$197,887	$265,792
$1-4mil	8	0	1.8	3	$1,335,690	$1,662,759	$551,127	$586,074
Total ownership entities	*35*							

Table 81 – Description of party/charter fishing businesses regulated by the Proposed Action

Sales	Number of entities	Number of large businesses	Average number of permits owned per entity	Maximum permits per entity	Median gross sales per entity	Mean gross sales per entity
<$50K	297	0	1.0	2	$8,433	$13,432
$50-100K	43	0	1.0	2	$67,621	$72,191
$100-500K	73	0	1.2	3	$270,677	$269,155
$500K-1mil	18	0	1.7	5	$734,645	$720,083
$1-4mil	8	0	2.4	5	$1,258,528	$1,456,632
Total ownership entities	*439*					

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 51 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.” Given that the majority of the regulated entities impacted by this action are considered small, all of the proposed alternatives will have impacts on a substantial number of small entities.

Significant economic impacts

The outcome of “significant economic impact” can be ascertained by examining two factors: disproportionality and profitability.

- Disproportionality refers to whether or not the regulations place 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.

The proposed action has the potential to place small entities at a significant competitive disadvantage relative to large entities. Impacts on profitability from the proposed action may be significant for a substantial number of small entities as described in the next section.

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 51 on small entities. These alternatives include modifications to the GOM/Cod and American Plaice rebuilding strategies, modifications to the ACLs and sub-ACLs for white hake and the trans-boundary Georges Bank stocks, changes to small-mesh fishery Accountability Measures (AMs), updates to the US/CA TAC management measures, and changes to yellowtail flounder measures (GB and other).

The provisions to change the rebuilding strategies for GOM cod and American plaice are expected to positively impact profitability of small entities regulated by this action. All of the sub-options being considered for both species are expected to result in higher Net Present Values (NPVs) for each stock than under the no action alternative, which will translate into larger profits. The 10-year rebuilding plan for GOM cod is expected to have modest gains in NPV and profitability over the 8-year rebuilding plan and for American Plaice, there is little discernible difference between the three sub-options being considered. In addition, by adopting new rebuilding strategies for GOM cod and American plaice, the proposed action will circumvent severe economic loss that could occur under highly restrictive catch limits in FY2015, especially to groundfish-dependent small entities. Charter fishing businesses would also experience significant economic loss under the No Action option for GOM cod but would be unaffected by the American Plaice action as there is no directed recreational fishery and no recreational sub-allocation for American plaice. A more detailed discussion of the expected economic impacts can be found in Section 7.4.1.1.2 and Section 7.4.1.2.2 of this document.

The proposed action to modify the ACLs and sub allocations for white hake, GB East cod and haddock, and GB yellowtail flounder has the potential to impact groundfish and scallop-dependent small entities, and is discussed in the next section. Recreational harvesting entities as well as small-mesh fishery-dependent entities do not target the stocks in question and are not expected to be directly impacted. If the measure to modify the small-mesh GB yellowtail flounder AM is adopted in conjunction with the new ACLs specified, the likelihood of triggering expensive gear modifications could increase as a result of more restrictive GB yellowtail flounder catch limits. These impacts to the small-mesh fishery will be discussed in more detail under the small-mesh GB yellowtail flounder AM alternative. Only the impacts of Option 2, the preferred alternative, will be discussed here. Impacts of the No Action option, which would result in zero allocation for the four stocks mentioned above in FY2013 and FY2014, are discussed in detail in Section 7.4.1.3.1.

Economic impacts to groundfish-dependent small entities

The results of the QCM simulation discussed in Section 7.4.1.3.2 indicate that those entities which are dependent on groundfish landings will be negatively impacted by the proposed sub-ACLs. Gross revenues for the groundfish industry are predicted to decrease in FY2014 by 26% relative to FY2012 and by 4% relative to FY2013. In terms of net revenue FY2014 is predicted to see a 21% decline relative to FY2012 and a 12% decline relative to predicted net revenues for FY2013. While the QCM analysis is based exclusively on sector trips, it is likely that the potential negative impacts to profitability resulting from more restrictive sub-ACLs for GB cod, GB haddock, and GB yellowtail flounder will be shared by all groundfish-dependent small entities.

Economic impacts to scallop-dependent small entities

If the scallop fishery triggers the GB yellowtail flounder AMs, Option 2 would likely reduce scallop fishery revenues. How this reduction in revenue compares to the Option 1/No Action is unclear. The No Action does not identify a scallop fishery sub-ACL for GB yellowtail flounder. While this would not prevent the scallop fishery from fishing in FY2014, it is not clear if the absence of a sub-ACL would be treated as if the sub-ACL was zero. If this were the case, then catches would lead to scallop fishery AMs being triggered in FY2015 and/or later years. As a result, No Action/Option 1 would result in large reductions in scallop fishery revenues relative to Option 2. But if this is not the case, and the scallop fishery catches do not trigger AMs, then Option 1/No Action might allow for greater scallop fishery revenues than would be the case if AMs are triggered using the sub-ACL specified in Option 2.

Economic Impacts to small-mesh fisheries.

The preferred alternative to implement a GB yellowtail flounder AM for small-mesh fisheries is expected to negatively impact small-mesh fishery-dependent small entities and has the potential to create minor economic benefits for groundfish-dependent small entities. Under the preferred alternative, if the small-mesh sub-ACL for GB yellowtail flounder is exceeded, a gear-based AM will go into effect at the start of the next fishing year[15]. Details of the AM are presented in Section 4.2.1.2. Small entities would likely experience higher costs including the fixed cost of purchasing new gear and/or modifying existing gear. Their operating costs would probably increase as well due to the gear restrictions (lower catch rates), effectively lowering their net revenue and overall profitability. The impacts from the preferred sub-option are expected to be lower than under sub-option A which would close the GBYTF stock area to small-mesh fisheries if the sub-ACL is exceeded. If the chosen AM successfully reduces discards of GB yellowtail flounder and prevents overfishing, catch rates for the species could increase for groundfish-dependent small entities, resulting in small increases in profitability.

Economic impacts of other measures.

The provisions to modify the US/Canada TAC management measures are not expected to alter, in the short term, the aggregate amount of GB haddock caught by the groundfish fishery. Catch is persistently less than allocation for both the eastern and western stocks of GB haddock. Option 2 is expected to have no additional economic impacts, positive or negative, relative to the No Action alternative. Further, it is not known at this time if this option would increase or decrease quota allocated to groundfish fishermen. However, if the ability to alter quotas in season were to result in increased quota for sector and/or common pool fishermen, and if that quota were to be converted into landings, then Option 2 could be viewed as beneficial to groundfish-dependent small entities.

The alternative to modify the distribution of US TACs for Eastern/Western Georges Bank Haddock is expected to have small but positive impacts on groundfish-dependent small entities that participate in the sector program in terms of operational flexibility. Under the preferred sub-option, sector permits will be permitted to convert their Eastern GB haddock ACE to Western GB haddock ACE during the fishing year or up to 2 weeks into the following fishing year (unless otherwise instructed by NMFS) to cover any overage during the previous fishing year. Since catch for both stocks is persistently lower than sector ACE, the benefit is likely to be very small.

The proposed action to revise the discard strata for GB yellowtail flounder is only expected to impact groundfish-dependent entities that participate in the sector program. The stratification used to monitor common pool trips would not be changed. If the discard rate is lowered in area 522, vessels fishing in that area will be able to expend less GB yellowtail flounder quota on each trip, increasing net revenues by allowing for more fishing. This is expected to have the largest effect on trawl vessels, since they are the vessels that predominantly fish in area 522. If area 522 is removed from the discard rate calculation for other areas, the discard rate for other areas would likely be higher

[15] If reliable information verifying the overage is not made available prior to the start of the next fishing year, then the AM will be delayed for one additional fishing year.

than in the past (Section 7.1.2.3.2). This will represent decreased net revenues to vessels fishing in those areas, because the opportunity cost of quota will likely increase.

Finally, the alternative to prohibit the possession of yellowtail flounder by the limited access scallop fishery is expected to impact scallop-dependent small entities only. If scallop vessels are prohibited from retaining and landing yellowtail flounder there could be some economic loss for vessels that have been landing the species. Only a relatively small proportion (less than a quarter) of the active limited access fishery is currently landing yellowtail flounder and the average revenue per vessel from yellowtail flounder is less than 5% of average total revenue as discussed in Section 7.4.2.4.2. As such, the effects of the proposed action on the profitability of scallop-dependent entities are expected to be small.

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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