Fishing Years 2015-2020 Northeast Multispecies Sector Operations Plans and Contracts

A Draft Programatic Environmental Assessment

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NOAA FISHERIES | Greater Atlantic Region
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ACRONYMS

ABC	Acceptable Biological Catch
ACE	Annual Catch Entitlement
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ASMFC	Atlantic States Marine Fisheries Commission
B_{MSY}	Biomass necessary to produce maximum sustainable yield
CEA	Cumulative Effects Assessment
CEQ	Council on Environmental Quality
cm	Centimeter
Council	New England Fishery Management Council
CPUE	Catch per unit of effort
CY	Calendar year
DAS	Days-at-sea
DSM	Dockside Monitoring Program
DPS	Distinct population segment
EA	Environmental Assessment
EEZ	Exclusive economic zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing mortality rate
FGS	Fixed Gear Sector
FMP	Fishery management plan
F_{MSY}	Fishing mortality rate that produces the maximum sustainable yield
FW	Framework
FY	Fishing year
GARM	Groundfish Assessment Review Meeting
GB	Georges Bank
GOM	Gulf of Maine
HPTRP	Harbor Porpoise Take Reduction Plan
kg	Kilogram
km	Kilometer
lbs	Pounds

m	Meter
MAFMC	Mid-Atlantic Fishery Management Council
MCS	Maine Coast Sector
mm	Millimeter
MMPA	Marine Mammal Protection Act
MSY	Maximum Sustainable Yield
mt	Metric ton
NCCS	Northeast Coastal Communities Sector
NEFMC	New England Fishery Management Council
NEFS	Northeast Fishery Sector
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NLCA	Nantucket Lightship Closed Area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PBR	Potential Biological Removal
PSC	Potential Sector Contribution
RMA	Regulated Mesh Area
SAP	Special Access Program
SBRM	Standardized Bycatch Reporting Methodology
SEFSC	NMFS Southeast Fisheries Science Center
SHS	Sustainable Harvest Sector
SNE	Southern New England
SNE/MA	Southern New England/Mid-Atlantic
TAC	Total allowable catch
TED	Turtle exclusion device
TSS	Tri-State Sector
U.S.	United States
USFWS	United States Fish and Wildlife Service
VEC(s)	Valued Ecosystem Component(s)
VMS	Vessel Monitoring System
VTR	Vessel trip report
WNA	Western North Atlantic

1.0 INTRODUCTION

What's in Section 1?

Section 1 explains why and how this document was prepared. It also gives background information on the Northeast Multispecies fishery and a history of sector management. This document evaluates:

- Sector operations plans for fishing years 2015-2020
- Exemptions from multispecies regulations for sectors during fishing years 2015-2020

What is a sector?

A sector consists of three or more persons who:

- hold limited access Northeast Multispecies vessel permits
- do not have an ownership interest in the other two persons in the sector
- voluntarily enter into a contract in which they self-select their members
- are granted an annual allocation of large-mesh multispecies fish
- agree to certain fishing restrictions for a specified period of time

Sectors are a management tool that has been used in the in the Northeast Multispecies fishery for a number of years. In 2004, Amendment 13 to the Northeast Multispecies Fishery Management Plan (FMP) authorized the first sector. Amendment 16 to the FMP revised and expanded the sector program in 2010.

Why is this document being prepared?

Sectors wanting to operate in a given fishing year must submit an operations plan and an accompanying National Environmental Policy Act (NEPA) document for approval by the National Marine Fisheries Service (NMFS).

> A sector operations plan is an enforceable document that details how the sector and its member vessels operate in a given fishing year. The plan specifies how the sector distributes its allocation of fish among members and enforces sector rules.

Due to the interrelated nature of impacts resulting from the operation of sectors, and exemptions to fishery regulations, NMFS agreed to prepare the required NEPA documentation to accompany the sector operations plans it has or expects to receive for fishing year (FY) 2015-2020. Fishing years for the Northeast Multispecies fishery run from May 1 to April 30(e.g., FY 2015 is May 1, 2015 through April 30, 2016. This Environmental Assessment (EA) describes the potential impacts of approving FY 2015-2020 sector operations plans on the human, physical, and biological environment. NMFS prepared this EA in compliance with the sector provisions as described in Amendment 16 to the Northeast Multispecies FMP (75 FR 18262 4/9/2010) and as implemented by the regulations at 50 CFR 648.87.

Why was the analysis for all sectors combined into one document?

This EA incorporates analyses for the operation of all seventeen FY 2015/16 sector operations plans, and similar future submitted operations plans covering the temporal extent of this analysis. These operations plans can be viewed at: http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/multispecies/. NMFS chose this method for several reasons. First, each sector can trade their entire annual allocation of fish. This makes it difficult to limit the scope of the analysis to one sector's initial allocation. Second, each sector can request exemptions from Northeast Multispecies regulations in their operations plans. Because sectors can trade their allocations amongst themselves, no direct correlation can be made between a specific sector, allocation, and regulatory exemption. Therefore, NMFS analyzes each exemption for approval to all sectors. Sectors benefit from this approach, gaining flexibility in obtaining an exemption that they may not have originally requested, while NMFS is able to better analyze the maximum impact of an exemption. Lastly, NMFS took this single EA approach based on the continued uniformity seen in the FY 2015/16 operations plans. This method is consistent with the approach taken since the FY 2011 sector operations plan EA. NMFS intends for this approach to be more user friendly than preparing a separate EA for each of the sector operations plans.

What is the basis for the analysis in this document?

The analysis in this EA tiers off the broader information and analysis contained in the Environmental Impact Statement (EIS) for Amendment 16 to the Northeast Multispecies FMP. "Tiering" is encouraged by the Council on Environmental Quality (CEQ) to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review (40 CFR 1502.20). The Amendment 16 EIS analyzed fishery-wide measures to achieve mortality targets, target healthy stocks, and mitigate the economic impacts. The Amendment 16 EIS also examined measures to improve administration of the fishery, including an analysis of the sector program.

A sector roster is a list of limited access Northeast Multispecies permits enrolled in a sector for a given fishing year and have signed a contract with the sector.

NMFS based the analysis in this EA upon the sector operations plans for FY 2015/16 that sectors submitted in September 2014. Sectors are required to submit a membership roster prior to the start of FY 2015. The roster deadline for FY 2015 is based on when NMFS mails Potential Sector Contribution (PSC, see Section 1.1.1) letters, is different from year to year, and is not known at this time. The regulations allow for permits with an ownership change after December 1 to change sector enrollment, or join the common pool, up until April 30. Typically very few permits take advantage of this limited window to change enrollment after the initial commitment to a sector for the following fishing year. Accordingly, final FY 2015 rosters are not available for inclusion in the EA. However, NMFS believes that their ommitance does not materially affect the analysis.

The analysis in this document assumes that 100% of the limited access Northeast Multispecies permits enroll in sectors for a given fishing year. In FY 2014 sector vessels held approximately 99% of the allocation for the entire fishery. Therefore, assuming 100% effort for this EA is a small and appropriate increase from the anticipated sector allocation. This conservative approach ultimately allows NMFS to analyze the maximum fishing effort that could occur under sectors and avoids underestimating sector effort given that sector rosters will continue to change on a yearly basis.

Why is this document covering a six year period?

In this document, NMFS analyzed the impacts expected from the continued operation of sectors over the next six years. This programmatic look is rooted in an analysis of past and current operations plans and exemptions. Therefore, NMFS made an effort to be as comprehensive as possible in a programmatic look to best ensure that sector operations would be fully assessed over the six year period. NMFS decided to do a programmatic assessment beginning in FY 2015 because the past four years of sector operations have been relatively homogeneous, and the EA covering the management regime has changed little since inception of the program. NMFS believes future sector operations would likely operate similarly, and the impacts associated with their activities would also likely be similar in nature to past years. However, NMFS understands that it is impossible to fully anticipate the future, and that new requests for sector exemptions may arise that could have impacts outside the scope of this programmatic document. In that case, a supplementary EA may be necessary to analyze future sector operations. Please see sections 3.1 and 5.1.1.3 for a detailed discussion of the programmatic approach to sector management analysis.

1.1 MULTISPECIES FISHERY

The New England Fishery Management Council (NEFMC or Council) implemented the Northeast Multispecies FMP in 1986 to comply with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The FMP sought to reduce fishing mortality of heavily fished groundfish stocks and promote rebuilding of those stocks to sustainable biomass levels. The Northeast Multispecies FMP currently manages thirteen species. Some of these species are sub-divided into individual stocks based on geographic area. These species and stocks are:

- Georges Bank (GB) cod
- Gulf of Maine (GOM) cod
- GB haddock
- GOM haddock
- GB yellowtail flounder
- Southern New England/Mid-Atlantic (SNE/MA)yellowtail flounder
- Cape Cod/GOM yellowtail flounder
- American plaice
- Witch flounder
- GB winter flounder
- GOM winter flounder
- SNE/MA winter flounder
- Redfish
- White hake
- Pollock
- Northern windowpane flounder
- Southern windowpane flounder
- Ocean pout
- Atlantic halibut
- Atlantic wolffish

The Northeast Multispecies FMP operates under a dual management system which breaks the fishery into two components: sectors and the common pool (non-sector fishery).

1.1.1 Sectors

What is the official definition of a sector?

The regulations at 50 CFR § 648.87 define a sector as "[a] group of persons (three or more persons, none of whom have an ownership interest in the other two persons in the sector) holding NE multispecies limited access vessel permits who have voluntarily entered into a contract and agree to certain fishing restrictions for a specified period of time, and which has been granted a total allowable catch (TAC) in order to achieve objectives consistent with applicable FMP goals and objectives." Sectors are self-selecting, meaning each sector maintains the ability to choose its members.

How are sector allocations determined?

Each sector receives a total amount (in pounds) of fish it can harvest for each stock. This amount is the sector's Annual Catch Entitlement (ACE). Each individual sector's ACE for a particular stock represents a share of that stock's Annual Catch Limit (ACL). ACLs are the amount of catch allowed for the entire Northeast Multispecies fishery. The Magnuson-Stevens Act requires these levels are set in order to ensure that overfishing does not occur.

In the Northeast Multispecies fishery, the ACL is set below the Acceptable Biological Catch (ABC) of the fishery, to account for management and scientific uncertainty. When permit holders join a sector, they bring a PSC, which is a share of the ACL for each stock. PSC is based on the fishing history attached to each permit joining that sector in a given year. To determine the ACE, all of the sector members' PSCs (a percentage) are multiplied by the ACL. In other words, a sector's ACE is the sum of its members' PSCs. Sectors may transfer ACE to any other sector at any time during the fishing year.

What fish stocks are allocated to sectors?

NMFS allocates a total of 15 Northeast Multispecies fish stocks to sectors. This document refers to these fish as "allocated target species".

Sectors are not allocated certain stocks of concern. These species include Atlantic halibut, windowpane flounder, ocean pout and Atlantic wolffish. Atlantic halibut, while not allocated to sectors, is managed by a possession limit. However, ocean pout, wolffish, and the two stocks of windowpane flounder may not be harvested.

Although GB cod and haddock are divided into two separate stocks (eastern and western), NMFS does not assign individual sector members a PSC for Eastern GB cod or Eastern GB haddock; instead, NMFS assigns a permit a PSC for the GB cod stock and GB haddock stock. Each sector's GB cod and GB haddock allocations are then divided into an Eastern ACE and a Western ACE, based on each sector's percentage of the GB cod and GB haddock ACLs. For example, if a sector is allocated 4 percent of the GB cod ACL and 6 percent of the GB haddock ACL, the sector is allocated 4 percent of the commercial Eastern U.S./Canada Area GB cod total allowable catch (TAC) and 6 percent of the commercial Eastern U.S./Canada Area GB haddock TAC as its Eastern GB cod and haddock ACEs. These amounts are then subtracted from the sector's overall GB cod and haddock allocations to determine its Western GB cod and haddock ACEs. A sector may only harvest its Eastern GB cod ACEs in the Eastern U.S./Canada Area. FW 51 allowed sectors to convert Eastern GB haddock ACE to Western GB haddock ACE, but not vice versa.

Terms to know:

Allocated target species are the groundfish species for which the sector receives an ACE.

Non-allocated target species are species which sector vessels target but are not assigned an ACE. Non-allocated target species may be caught by the same gear while fishing for allocated target species. They may be brought to shore and sold to dealers (i.e., "landed") if the fisherman has proper authorization or permit(s). These non-allocated target species may be managed under the Northeast Multispecies FMP (e.g., halibut and whiting) or another FMP (e.g., Monkfish FMP).

As defined in the Magnuson-Stevens Act, **bycatch** refers to "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards."

Can sectors harvest species that are not allocated?

In addition to harvest of allocated species, sector participants may also harvest non-allocated target species and bycatch species. For the purposes of this EA, the discussion of non-allocated target species and bycatch refers primarily to skates, monkfish, and dogfish. These species dominate bycatch (e.g. dogfish) or are the primary alternate species that groundfishermen land (e.g monkfish and skates).

Can a sector exceed its allocation?

Each sector's ACE is a hard total allowable catch (TAC) that the sector cannot exceed. Therefore, this output-based sector system caps the total amount of each stock which fishermen can harvest. Once a sector catches its entire ACE for a particular stock, it is required to cease all fishing operations in that stock area until it acquires additional ACE for that stock. A stock area is the entire geographic area in which a stock is managed. Any sector that exceeds its ACE in a given fishing year is subject to accountability measures (AMs) such as a reduction in its ACE for the following year to account for the previous year's overage.

What are the benefits of the sector system?

A sector's ACE caps fishing mortality. Therefore, sectors:

- are exempt from some effort control measures such as Days at Sea (DAS) on all allocated groundfish stocks, differential DAS counting areas, trip limits on allocated stocks, and the seasonal closure on Georges Bank (see universal exemptions below);
- serve as an important tool for ending overfishing and rebuilding overfished fish stocks; and
- are held accountable for their landings and discards. AMs are triggered if their ACLs are exceeded.

Sectors are designed to alleviate social and economic hardships that may result from stock rebuilding efforts by:

- reducing costly input controls that were designed to decrease efficiency; and
- promoting operational flexibility for sector members by the:
    - internal and external transfer of ACE
    - pooling of harvesting resources.

What are the requirements for a sector operations plan?

Sector operations plan requirements are specified at 50 CFR § 648.87(b)(2).

In order to receive an ACE, sectors submit an operations plan to NMFS for approval by a specified date. A sector can request that NMFS approve their operations plan for either one or two fishing years. The operations plan is legally binding and is subject to NEPA review. The plan describes how the sector will fish their ACE and monitor their catch. It also governs the fishing behavior of sector members for the entire fishing year. If, for example, a member chooses to leave the sector during the fishing year, that member's contribution to the sector's allocation would remain with the sector for the remainder of the fishing year. As a result, that member would not be allowed to fish in the groundfish fishery for the rest of that fishing year.

A sector operations plan generally includes:

- a list of all participating permits
- a plan for consolidation or redistribution of ACE
- information about redirection of effort into other fisheries
- a list of management or harvest rules
- a method for the allocation of the sector's ACE amongst its members
- information about entry, exit and expulsion from a sector
- information regarding intra-sector penalties
- a detailed plan for monitoring and reporting of landings and discards, including thresholds which increase the reporting frequency, and
- a list of proposed exemptions from Northeast Multispecies regulations

Are sectors exempt from any other regulations?

Sectors are universally exempt from a number of multispecies regulations. Since a sector's ACE caps fishing mortality, many effort control measures are no longer necessary. Amendment 16 universally exempted sectors vessels from:

- the Georges Bank Seasonal Closure in May

- groundfish DAS requirements, including DAS reductions, differential groundfish DAS counting, and the 3/15 rule for gillnets

- all Gulf of Maine Rolling Closures except for: Blocks 124 and 125 in April; Blocks 132 and 133 in April-May; Block 138 in May; Blocks 139 and 140 in May-June; and Blocks 145, 146,147, and 152 in June (FW 53 in development may revise the rolling closures. As such, please see FW 53 for additional information regarding rolling closure access)

- any additional mortality controls adopted by Amendment 16, including additional seasonal or year-round closures1, gear requirements, DAS reductions, differential DAS counting, and restricted gear areas

- the requirement to use 6.5-inch mesh (16.5 cm) in the codend in haddock separator trawl/Ruhle trawl when targeting haddock in the Georges Bank Regulated Mesh Area (i.e., authorized to use 6-inch mesh (15.2 cm) in the codend)

- trip limits on stocks for which a sector receives an allocation, except for the following:

    a) Halibut: The trip limit would continue to be one fish per trip; and
    b) Windowpane flounder (both stocks), ocean pout, or wolffish: No vessel, whether in the common pool or in any sector, can possess any of these stocks on board at any time. When caught, these species must be returned to the sea and reported as discarded

The Final EIS for Amendment 16 to the Northeast Multispecies FMP (NEFMC 2009a) analyzed these universal exemptions. Refer to the Amendment 16 FEIS and final rule for further description of these universal exemptions.

How do sectors interact with the U.S./Canada Area and Special Access Programs (SAP)?

Sectors receive a separate ACE for those stocks that have a TAC specific to the Eastern U.S./Canada Area. This currently applies to GB cod and GB haddock only. However, this measure would apply to other stocks if an area-specific TAC is defined. For further information see section 4.2.3.3.3 of the Amendment 16 EIS.

Sector vessels can participate in special management programs provided the sector has ACE for the stocks caught in the SAP, and the ACE is sufficient to account for the expected catch in the SAP. Amendment 16 details sector guidelines for participating in the Eastern U.S./Canada Haddock SAP,

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[1] NMFS is granting year-round access to the Eastern U.S./Canada Area for yellowtail flounder as stipulated, but not specified, in Amendment 16.

Closed Area II Yellowtail Flounder SAP, and Closed Area I Hook Gear Haddock SAP. For further information see section 4.2.3.8 of the Amendment 16 EIS.

Fishermen who do not join a sector fish in the common pool.

1.1.2 Common Pool

Fishermen who do not join a sector fish in the common pool. Vessels in the common pool are allocated a certain number of Days at Sea (DAS). Vessels that fish in the common pool are managed by a variety of input and effort controls such as DAS, trip limits, closed areas, minimum fish sizes, and gear restrictions. These effort controls are subject to inseason adjustments. While vessels in the common pool can lease DAS from other common pool vessels, no exchange of DAS or ACE can occur between the common pool and sector vessels. For FYs 2010 through 2014, between 38 and 48 percent of limited access NE multispecies permits elected to fish in the common pool. *However, these permits only accounted for approximately 2 percent of the historical fishing effort.* Therefore the common pool only receives a very minor portion of the ACL.

1.1.3 Potential for Redirection of Effort and/or Fleet Consolidation

Sectors provide information in their FY 2015/16 operations plans about their expected level of effort redirection and vessel consolidation. The sectors make these predictions based on vessel activities in the first quarter of FY 2014. Sectors identify the percentage of enrolled permits that were attached to vessels in FY 2015 as compared to the percentage expected to fish for groundfish in FY 2014. Further, operations plans identified the percentage of permits associated with vessels anticipated during FY 2015. Twelve sectors expect that, compared to FY 2014, there would be little to no change from the consolidation that previously occurred within the sector during FY 2013. In this case, most sectors anticipate that a member who owns multiple permits and fished all those permits on a single hull will now continue to fish the harvest share contributed by all of those permits on the same single hull, resulting in no additional consolidation. NEFS 4 is a lease only sector and notes in their operations plan that their leases will help to minimize consolidation in the NEFS 2 & NEFS 3 sectors. NEFS 1 is a sector without active permits. SHS 1 and SHS 3 have not provided information on consolidation as of the date of this EA.

Sectors report that their members redirected effort to the following species in FY 2013 and/or the first quarter of FY 2014: Atlantic bluefish, Atlantic herring, Atlantic sea scallops, black sea bass, bluefin tuna, butterfish, elvers, lobster, mackerel, monkfish, other multispecies, scup, shrimp, skates, spiny dogfish, squid, striped bass, summer flounder, swordfish, and whiting. Additionally several sectors noted redirection on the State of Massachusetts squid, fluke, horseshoe crab, and whelk fisheries. Six sectors anticipate that they would have no redirection in FY 2015/16. The remaining sectors anticipate that redirection would be similar to or increased for the species they redirected on, FY 2013 and/or the first quarter of FY 2014. More information on consolidation and redirection trends in this fishery is found in Section 4.6.8.3 and within the cumulative impacts section.

1.2 HISTORY OF SECTORS IN THE NORTHEAST MULTISPECIES FISHERY

1.2.1 Amendment 13

The final rule implementing Amendment 13 to the Northeast Multispecies FMP (69 FR 22906, April 27, 2004) implemented a process for the formation of additional sectors and for allocation of TAC[2] or DAS, depending on the groundfish stock. Amendment 13 established the various elements of the first sector, the Georges Bank Cod Hook Sector, and implemented restrictions that apply to all sectors. NMFS approved the Georges Bank Cod Hook Sector for operation in 2004 (69 FR 43535 July 21 2004). Framework (FW) 42 authorized the GB Cod Fixed Gear Sector in 2006 (71 FR 62156, October 23, 2006).

Amendment 13 also laid out the rebuilding plans for certain stocks managed under the Northeast Multispecies FMP. NMFS completed benchmark stock assessment meetings in 2005 and 2008. NMFS checked stock rebuilding progress through Groundfish Assessment Review Meeting (GARM) II and GARM III (Mayo and Terceiro 2005, NEFSC 2008). The results of the GARM III indicated a need for adjustments to the rebuilding plans (NEFSC 2008). Per Amendment 13, revised rebuilding timelines needed to be in place for FY 2009 (halfway through the rebuilding plan for most stocks).

Amendment 16 ushered in a new level of sector participation.

1.2.2 Amendment 16

Amendment 16 to the Northeast Multispecies FMP addressed the findings of the GARM III by imposing management measures consistent with species rebuilding plans and schedules. During the 2006 scoping process, the Council received a number of recommendations for new ways to manage the fishery. All of the recommendations required major changes to the Northeast Multispecies FMP (71 FR 64941, November 6, 2006). Faced with a 2009 deadline, the Council voted to postpone development of all new management alternatives. This left Amendment 16 to focus on addressing the rebuilding plans as required under Amendment 13. However, in April 2007, seventeen different groups of fishermen submitted sector proposals and requested that the Council consider and approve additional new sectors through Amendment 16. As a result of the increased interest in sectors, the Council decided to revise sector procedures and policies in Amendment 16. Revisions included the implementation of dockside and at-sea monitoring program requirements, as well as provisions to allow the trading of ACE between sectors. The Council submitted the final Amendment 16 and accompanying Final EIS on October 16, 2009. NMFS issued the proposed rule for Amendment 16 on December 31, 2009, (74 FR 69382) and the final rule on April 9, 2010 (75 FR 18262).

Amendment 16 ushered in a new level of sector participation. In FY 2010, NMFS allocated ACE to 17 sectors through FW 44 [(75 FR 18356, April 9, 2010), Final Adjustment to FW 44 Specifications (75 FR 29459, May 26, 2010)]. Over 50 percent of eligible Northeast Multispecies permits and approximately 98 percent of landings history participated in sectors during FY 2010. NMFS prepared seventeen individual EAs, one for each discrete sector operations plan. NMFS approved of seven different sector exemptions for FY 2010.

[2] TAC is the catch limit set for a particular fishery. It is generally set for a year, or part of a year. The revised 2006 Magnuson-Stevens Act replaced the term TAC with the term ACL, However, TAC is still used in reference to stocks jointly managed by U.S. and Canada and is referenced by older regulations such as Amendment 13 to the Northeast Multispecies FMP.

1.2.3 Sector Management in FY 2011 through FY 2014

Seven additional groups of fishermen submitted sector proposals for consideration by the Council as new sectors in FY 2011. Five of these groups were proposed and approved in FW 45. Four of these sectors involved National Oceanic and Atmospheric Administration (NOAA)-sponsored, state-operated permit banks. State-operated permit banks were formed for the sole purpose of transferring ACE to qualifying sectors at any time during the fishing year. However, only the Maine Permit Banking Sector was ultimately able to fulfill sector membership requirements to operate in FY 2011. Amendment 17 to the FMP was completed in 2012 to further develop State-operated permit banks, and to streamline the administrative requirements these permit banks must meet to lease ACE to a sector. As a result, no state operated banks submitted operations plans to become sectors for FY 2013, FY 2014 or FY 2015 and FY 2016.

NMFS approved 19 sectors to operate in FY 2011 (76 FR 23076). NMFS granted sectors a total of 17 exemptions from multispecies fishing regulations. Sector enrollment for FY 2011 represented over 50 percent of eligible northeast groundfish multispecies permits and over 98 percent of the ACL for the entire fishery.

NMFS approved 19 sectors to operate in FY 2012 (77 FR 26129). NMFS granted sectors a total of 20 exemptions from multispecies fishing regulations. Sector enrollments for FY 2012 represented over 60 percent of eligible northeast groundfish multispecies permits and approximately 99 percent of the ACL for the entire fishery.

NMFS approved 17 sectors to operate in FY 2013 (78 FR 25591). NMFS granted sectors a total of 23 exemptions from multispecies fishing regulations. Sector enrollments for FY 2013 represented over 62 percent of eligible northeast groundfish multispecies permits and approximately 99 percent of the ACL for the entire fishery.

NMFS approved 17 sectors to operate in FY 2014 (79 FR 23278). NMFS granted sectors a total of 20 exemptions from multispecies fishing regulations. Sector enrollment for FY 2014 represented over 61 percent of eligible northeast groundfish multispecies permits and approximately 99 percent of the groundfish catch ACL(s) for the entire fishery.

What's in Section 2?

This section describes:

- the specific objectives of this action (purpose)
- the underlying problem that will be addressed in this action (need)

2.0 PURPOSE AND NEED FOR THE ACTION

The purpose of this action is to facilitate the implementation of FY 2015 to FY 2020 sector operations plans and associated regulatory exemptions. In an effort to rebuild the Northeast Multispecies complex, other actions have reduced the allocations of several stocks managed by the Northeast Multispecies FMP. This action is needed to provide flexible fisheries management that mitigates social and economic hardships resulting from those reductions. This action seeks to fulfill the purpose and need while meeting the biological objectives of the Northeast Multispecies FMP, as well as the goals and objectives set forth by the Council in the Northeast Multispecies FMP.

The receipt of 17 sector applications for FY 2015 and FY 2016 validates the need for this action. Each sector would represent a group of limited access multispecies permit holders cooperating to harvest their allocation more efficiently.

3.0 PROPOSED ACTION AND ALTERNATIVES

What's in Section 3?

This section describes the proposed action and alternatives considered in sector operations plans for FY 2015/16. A no action alternative is also described for each alternative.

- Alternative 1 considers the approval of sector operations plans.
- Alternative 2 considers exemptions from multispecies regulations for approved sectors.

Although grouped together for analysis, NMFS would independently approve or disapprove each sector operations plan and exemption in the final action. Aggregating the sectors allows NMFS to analyze the maximum potential impacts of each exemption and accounts for the possibility of entire allocations being traded between sectors.

3.1 PROGRAMATIC APPROACH TO SECTOR MANAGEMENT ANALYSIS

As stated in Section 1, this document is a programmatic analysis for sector operations from FY 2015 through FY 2020 (through April 30, 2021). As such, future approvals of operations plans up and until the expiration of this analysis on April 30, 2021 would be covered by this analysis unless impacts related to such approvals were substantially dissimilar to those analyzed within this EA. Operations plans contain certain elements as required by the regulations implementing the FMP, and have remained consistent since the inception of sector management. Essentially, these sector operations plans and contracts approved by NMFS allowing sectors to operate contain administrative components that are reasonably foreseeable, and not expected to substantially change over time. The component of the sector operations plan that contains exemption requests is the portion that may change over time, and as such all exemption approvals during this timeframe would be analyzed in terms of their impacts compared to the exemptions listed in Section 5.1.4 of this EA. Over the last few years of sector management, the requests for novel exemptions from regulations have dramatically fallen. For FY 2015/16, sectors only requested one new exemption that was actually a revision to an approved FY 2014 exemption (redfish). For future exemptions that are substantially similar to the following exemptions and/or that have impacts that are substantially similar, no additional NEPA documentation would be necessary for their approval. However, it is possible that exemptions may be requested that are not substantially similar to the exemptions analyzed in this EA. In these cases, a supplemental environmental assessment may be needed to analyze the impacts of that future approval.

3.2 ALTERNATIVE 1 - IMPLEMENTATION OF SECTOR OPERATIONS PLANS FOR FISHING YEAR 2015/16

Alternative 1 is the approval of up to 17 sector operations plans for FY 2015/16. Vessels enrolled in an approved sector would fish under the sector provisions of the Northeast Multispecies FMP and their sector's harvest rules. An ACE would limit each sector's total harvest.

Table 1 identifies each individual sector and summarizes sector participants as a group based on information submitted by the sectors as of September 2014. Preliminary information suggests that the sectors would utilize 24 primary ports located throughout the Northeast and Middle Atlantic regions. The vessels would likely fish throughout the year on all major Northeast fishing grounds to which they are granted access.

Each sector requested an ACE in their operations plan. In FY 2014 the percentage of ACL for the 15 stocks that NMFS allocated to a particular sector as ACE ranged from less than 0.01% to 51%. We expect little change for FY 2015/16. Although the roster data provides some baseline information on the fishery, as stated earlier in the EA, this sector EA assumes that 100 percent of the fishing effort could occur in sectors. Please refer to Appendix B for a breakdown of each sector's FY 2014 PSC by allocated target stock compared to all other sectors and the common pool. Please refer to Figure 69 for a comparison of the percentage of allocated target stocks in all sectors and the common pool in FY 2014.

All sectors except for Northeast Fishery Sector 4 (a lease-only sector) have also included a special provision in their operations plans that NMFS believes may result in impacts beyond those discussed generally for all sectors. The provision prohibits a sector vessel from fishing outside of Broad Stock Area 1 (the entire Gulf of Maine) if it fishes west of 70° 15'W. This provision, referred to as the "Inshore Gulf of Maine Declaration" requires sector vessels to declare their intention to fish "inshore" or "offshore" prior to departure. Vessels declaring an "inshore" trip can fish anywhere in Broad Stock Area 1. Vessels declaring an "offshore" trip can fish anywhere in the Gulf of Maine, Georges Bank, or south, except for inshore Gulf of Maine west of 70° 15'W. This provision was developed collaboratively by sectors to help managers better identify where vessels are fishing. It will allow for better identification of catch as vessels fishing inshore Gulf of Maine are unable to fish in a different stock area. For example, Gulf of Maine cod caught inshore cannot be mis-reported as Georges Bank cod. This provision would not apply to a vessel with an observer or at-sea monitor on board because the observer records catch location.

A complete description of each individual sector's operations plan is available at http://www.regulations.gov.

3.2.1 No Action Alternative 1

Under the No Action for Alternative 1, NMFS would not approve one or more sector operations plans. Therefore, vessels associated with these disapproved sectors would return to, or remain in, the common pool where they would fish under DAS regulations for FY 2015/16.

Table 1. Summary of the All Sector Operations Plans for Fishing Years 2015-2016

Sector Name	# of Active Vessels	# of Permits	Primary Ports	Primary Fishing Grounds	Estim and
Fixed Gear Sector (FGS)	TBD	TBD	Chatham, MA; Harwich, MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: Gillnet Hook C
Maine Coast Community Sector (MCCS) (*formerly Port Clyde Community Groundfish Sector*)	20	45	Portland, ME; Port Clyde, ME; Kennebunkport, ME; Harpswell, ME	Gulf of Maine Inshore Georges Bank Offshore Georges Bank	Trawl: Gillnet
Northeast Coastal Communities Sector (NCCS)	TBD	26	Boothbay Harbor, ME; Portland, ME; Port Clyde, ME; New Bedford, MA; Marshfield, MA; Sandwich, MA	Gulf of Maine Inshore Georges Bank Southern New England/Mid-Atlantic	Trawl: Gillnet Hook C
Northeast Fishery Sector (NEFS) 1	0	3	N/A	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	N/A
NEFS 2	35	81	Gloucester, MA; Boston, MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid Atlantic	Trawl:
NEFS 3	TBD	30	Gloucester, MA, New Bedford, MA; New London, CT	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: Gillnet Hook C Pot/Tra
NEFS 4	0*	50	N/A	N/A	N/A
NEFS 5	23	29	Point Judith, RI	Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: Gillnet
NEFS 6	TBD	TBD	Boston, MA; Gloucester, MA; New Bedford, MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl:

NEFS 7	8	22	New Bedford, MA ; Nantucket, MA ; Point Judith, RI	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 80 Gillnet: 2
NEFS 8	5	20	New Bedford, MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 10
NEFS 9	24	60	New Bedford, MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 10
NEFS 10	TBD	TBD	Boston, MA; Gloucester, MA; New Bedford, MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 50 Gillnet: 5
NEFS 11	15	56	Portsmouth, NH; Seabrook, NH; Rye, NH, Portland, ME	Gulf of Maine	Trawl: 30 Gillnet: 7
NEFS 13	23	53	New Bedford, MA; Gloucester, MA; Point Judith, RI;	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 10
Sustainable Harvest Sector (SHS) 1	20	60	Portland ME, Gloucester MA, Boston MA, New Bedford MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 70 Gillnet: 3
SHS 3	10	50	Portland, ME; Gloucester, MA; Boston , MA; New Bedford , MA	Gulf of Maine Inshore Georges Bank Offshore Georges Bank Southern New England/Mid-Atlantic	Trawl: 10
Sector Wide	**TBD**	**TBD**	**Connecticut:** New London **Maine:** Boothbay Harbor, Harpswell, Kennebunkport, Portland, Port Clyde **Massachusetts:** Boston, Chatham, Gloucester, Harwich, Marshfield, Nantucket, New Bedford, Sandwich **New Hampshire:** Portsmouth, Rye, Seabrook **Rhode Island:** Point Judith	**Gulf of Maine** **Inshore Georges Bank** **Offshore Georges Bank** **Southern New England/Mid-Atlantic**	

Notes: * = NEFC 4 does not have active vessels at this time. NEFS 4 is a lease only sector and therefore gears, fishing grounds and ports are not listed. NEFS 4 will lease the majority of its ACE to NEFS 2 & 3. NEFS 1 is a new sector and meant to be used by NEFS 2 members.

Refer to the sector operations plans (http://www.regulations.gov) for a more detailed description of individual sectors.

Table 2. Summary of the All Sector ACEs as Percent of Commercial Groundfish Sub-ACLs for Fishing Year 2014 (Note: Previous Fishing Year)

Sector Name	GB Cod	GOM Cod	GB Haddock	GOM Haddock	GB Yellowtail Flounder	SNE/MA Yellowtail Flounder	CC/GOM Yellowtail Flounder	Plaice	Witch Flounder	GB Winter Flounder	GOM Winter Flounder	SNE/MA Winter Flounder	Redfish	White Hake	Pollock
FGS	27.72	2.51	5.76	1.84	0.01	0.31	2.90	0.98	2.13	0.03	12.87	1.67	2.74	5.70	7.38
MCCS	0.21	4.60	0.04	2.55	0.00	0.67	1.05	7.56	5.06	0.01	1.96	0.19	2.50	4.40	3.80
M PB	0.13	1.15	0.04	1.12	0.01	0.03	0.32	1.16	0.73	0.00	0.42	0.02	0.82	1.65	1.69
NCCS	0.17	0.85	0.12	0.36	0.84	0.73	0.63	0.16	0.22	0.07	0.93	0.30	0.43	0.81	0.51
NEFS 1	0.00	0.03	0.00	0.00	0.00	0.00	0.04	0.01	0.01	0.00	0.05	0.00	0.00	0.00	0.00
NEFS 2	5.78	18.24	10.69	16.36	1.91	1.42	19.31	7.87	12.80	3.22	18.43	3.27	14.74	5.94	11.26
NEFS 3	1.26	14.42	0.15	9.28	0.01	0.36	8.86	4.06	2.84	0.03	9.49	0.77	1.34	4.75	6.81
NEFS 4	4.14	9.59	5.32	8.35	2.16	2.38	5.47	9.29	8.50	0.69	6.24	1.29	6.64	8.06	6.14
NEFS 5	0.78	0.01	1.05	0.29	1.61	22.53	0.48	0.49	0.67	0.52	0.07	12.01	0.08	0.12	0.11
NEFS 6	2.87	2.95	2.92	3.85	2.70	5.31	3.74	3.88	5.20	1.51	4.55	1.94	5.31	3.91	3.29
NEFS 7	4.66	0.39	4.62	0.47	10.08	4.11	2.35	3.53	3.24	12.97	0.75	5.15	0.59	0.82	0.71
NEFS 8	6.14	0.46	6.00	0.20	11.26	6.05	6.40	1.72	2.57	15.55	3.16	10.13	0.55	0.51	0.61
NEFS 9	14.24	1.73	11.61	4.80	26.79	8.01	10.41	8.27	8.28	39.51	2.43	18.67	5.83	4.15	4.23
NEFS 10	0.73	5.21	0.25	2.53	0.02	0.55	12.67	1.70	2.39	0.01	17.84	0.73	0.55	0.89	1.39
NEFS 11	0.41	13.62	0.04	3.21	0.00	0.02	2.59	2.10	2.07	0.00	2.25	0.02	1.99	4.83	9.44
NEFS 13	7.92	0.95	15.96	0.99	24.73	18.78	5.03	5.14	6.20	7.26	2.34	10.98	3.98	1.74	2.27
NH PB	0.00	1.14	0.00	0.03	0.00	0.00	0.02	0.03	0.01	0.00	0.06	0.00	0.02	0.08	0.11
SHS 1	20.65	19.66	34.34	42.71	14.10	8.41	13.22	39.51	34.45	17.31	10.38	19.55	51.30	50.77	39.56
SHS 3	0.29	0.15	0.40	0.07	2.21	2.27	1.13	0.66	0.61	0.46	1.32	1.12	0.18	0.16	0.07
Sector Total	98.11	97.67	99.31	99.01	98.45	81.92	96.61	98.13	97.97	99.14	95.54	87.82	99.58	99.30	99.36
Common Pool	1.89	2.33	0.69	0.99	1.55	18.08	3.39	1.87	2.03	0.86	4.46	12.18	0.42	0.70	0.64

3.3 ALTERNATIVE 2 – SECTOR SPECIFIC EXEMPTIONS

In addition to the universal exemptions approved in Amendment 16, sectors requested a total of 19 sector specific exemptions from Northeast Multispecies regulations in their FY 2015/16 operations plans that NMFS is considering for approval. Alternative 2 is the approval of one or more sector specific exemption for FY 2014.

NMFS will only consider Alternative 2 if it approves at least one sector operations plan from Alternative 1. For the purposes of this EA, NMFS analyzed the impacts of each exemption for approval to all sectors (see Section 5.1). However, NMFS would independently approve or disapprove each individual exemption in the final rule. If approved, these exemptions would only apply to FY 2015/16 sectors which requested them. Table 3 lists which sectors have currently requested each exemption. Sectors can add most approved exemptions at any point during the fishing year. However, certain exemptions need to be in place for the entire year.

For the purposes of this EA, NMFS analyzed the impacts of each exemption for approval to all sectors

The majority of sector exemptions were previously requested and approved between FY 2010 and FY 2014. Sectors still have to request previously approved exemptions in their FY 2015/16 operations plans to allow NMFS to evaluate each exemption using updated information. NMFS typically approved FY 2010 through FY 2014 sector-specific exemptions if they were effort control measures or administrative requirements that would no longer be necessary when fishing under an ACE. These exemptions generally increased the operational flexibility and profit for fishermen in sectors while limiting overall fishing mortality. In addition to those exemptions requested and approved for FY 2010 through FY 2014, sectors requested one novel (identified as such) exemption for FY 2015/16. This novel exemption is a revision to the previously approved redfish mesh size exemption from FY 2014. The remainder of this section describes all of the sector specific exemptions requested by sectors in the FY 2015/16 sector operations plans.

Table 3. Proposed Sector Specific Exemptions for FY 2015/16

Exemptions	FGS	MCCS	NCCS	NEFS 1	NEFS 2	NEFS 3	NEFS 4	NEFS 5	NEFS 6	NEFS 7	NEFS 8	NEFS 9	NEFS 10	N
120 Day Gillnet Block out of the Fishery	X	X	X		X	X		X	X	X	X		X	
20 Day Spawning Block	X	X	X		X	X		X	X	X	X	X	X	
Limits on the Number of Gillnets for Day Gillnet Vessels	X	X	X			X			X	X			X	
Prohibition on a vessel's hauling another Vessel's gillnet gear	X	X	X			X			X	X			X	
Limits on the Number of Gillnets that May be Hauled on GB when fishing on a Groundfish/Monkfish DAS	X					X		X	X	X			X	
Limits on the Number of Hooks that May be Fished	X	X	X			X			X				X	
DAS Leasing Program Length and Horsepower Restrictions	X	X	X	X	X	X	X	X	X	X	X	X	X	
Prohibition on Discarding	X					X				X	X			
Daily catch reporting by Sector Managers for Sector vessels that fish in the CA I Hook Gear Haddock SAP	X				X	X			X				X	
Prohibition on Fishing Inside and Outside the CA I Hook Gear Haddock SAP While on the Same Trip	X		X			X			X				X	
Gear Requirements in the Eastern US/CA Management Area	X				X			X	X	X	X	X	X	
Powering VMS While at the Dock	X	X	X	X	X	X	X		X	X	X	X	X	
6.5-Inch Minimum Mesh Size Requirement to Allow Smaller Mesh for Targeted Redfish Trips		X			X				X	X	X		X	
Prohibition on a Vessel Hauing Another Vessel's Hook Gear	X		X						X	X			X	

Requirement to declare intent to fish in the Eastern US/CA SAP and CA II YT/haddock SAP from the dock	X				X	X		X	X	X	X	X	X
Seasonal Restrictions for the Eastern US/CA Haddock SAP	X				X	X		X	X	X	X	X	X
Seasonal Restrictions for the CA II YT/Haddock SAP	X				X	X		X	X	X	X	X	X
Nantucket Lightship Closed Area (E and W exemptions)	X				X	X		X	X	X	X	X	X
Prohibition on Combining Small Mesh Exempted Fishery and Sector Trips			X			X		X	X	X	X	X	X
Sampling Exemption	X	X											

What sector specific exemptions are NMFS considering for FY 2015/16?

1. *120-Day Block Requirement Out of the Fishery for Day Gillnet Vessels*

Each Northeast Multispecies Day gillnet vessel must take 120 days out of the non-exempt gillnet fishery (50 CFR § 648.82(j)(1)(ii)). Each block out is for a minimum of 7 consecutive days. Additionally, at least 21 of the 120 days must occur between June 1 and September 30.

The 120-Day block out requirement helped ensure that management measures for Day gillnet vessels were comparable to effort controls placed on other fishing gear types. The summer months were chosen because that was a time when gillnet fishing was most prevalent. FW 20 to the FMP (61 FR 55774) implemented the requirement on May 1, 1997.

Sectors requested that their Day gillnet vessels be exempt from the 120-day block out requirement. Sectors wish to increase their operational flexibility and efficiency with this exemption by having the opportunity to fish year-round.

2. *20-Day Spawning Block*

Vessels must declare out of the Northeast Multispecies DAS program for a 20-day period each calendar year between March 1 and May 31 (§ 648.82(g)). Spawning is most prevalent in the Gulf of Maine during this time. Therefore, the 20-Day spawning block serves as a mortality-control measure which provides protection to spawning aggregations.

Sectors requested that their vessels be exempt from the 20-day spawning block requirement. Sectors seek to increase their operational flexibility and efficiency with this exemption by having the opportunity to fish year-round.

3. *Limitation on the Number of Gillnets for Day Gillnet Vessels*

Net limits are in place for Day gillnet vessels in the groundfish regulated mesh areas (RMA). Day gillnet vessels can't fish more than 100 gillnets (of which no more than 50 can be roundfish gillnets) in the GOM RMA (§ 648.80(a)(3)(iv)); 50 gillnets in the GB RMA (§ 648.80(a)(4)(iv)); and 75 gillnets in the Southern New England ((§ 648.80(b)(2)(iv)) and Mid-Atlantic RMAs (§ 648.80(c)(2)(v)).

To enforce these regulations each gillnet has either one or two tags attached to it. The number of tags depends on the type of net and RMA fished. These restrictions prevent an uncontrolled increase in the number of nets fished. Such an uncontrolled increase would undermine the applicable DAS effort controls. The gillnet limit was implemented in 1996 by Amendment 7 and revised in Amendment 13.

Sectors requested that their Day gillnet vessels be exempt from gillnet limits. Sectors seek to increase landings per trip with this exemption. Under this exemption Day gillnet vessels would be able to use up to 150 nets total regardless of RMA and could mark their gear with one tag per net. Previously, a vessel fishing in the GOM RMA could use this exemption seasonally, but was restricted to the 100 net gillnet limit in blocks 124 and 125 in May, and in blocks 132 and 133 in June. In light of the 2014 stock assessment update for GOM cod and the November 2014 interim action that NMFS implemented to protect GOM cod (79 FR 67362; November 13, 2014), NMFS is proposing to deny this exemption for the GOM for FYs 2015/2016; however, in future years, this exemption could be approved; therefore, it is included in this Programmatic EA.

4. *Prohibition on a Vessel Hauling another Vessel's Gillnet Gear*

Current regulations prohibit one vessel from hauling another vessel's gillnet gear (§648.14(k)(6)(ii)(A) and §648.84). These requirements help enforce existing regulations since a single vessel is associated with each set of gear.

Sectors requested an exemption to the rules prohibiting hauling another vessels gear. With this exemption fishermen within the same sector could haul each other's gillnet gear. However, all vessels participating in "community" fixed gear would be required to mark the gear and would be jointly liable for any violations associated with that gear. Sectors seek to increase their operational flexibility and potentially decrease expenses with this exemption.

5. *Limitation on the Number of Gillnets that May be Hauled on Georges Bank When Fishing Under a Groundfish/Monkfish DAS*

Day gillnet vessels fishing on a groundfish DAS cannot possess, deploy, fish, or haul more than 50 nets on Georges Bank (§ 648.80(a)(4)(iv)). As a result, these regulations limit the number of gillnets vessels can haul on Georges Bank when fishing under a groundfish/monkfish DAS. Amendment 13 implemented this limit as a groundfish mortality control.

Sectors requested an exemption to Georges Bank net hauling limits. The exemption would not permit the use of additional nets. Dual-permitted sector vessels would simply haul nets they deployed in accordance to the Monkfish FMP more efficiently. Sectors seek to increase landings per trip with this exemption.

6. *Limitation on the Number of Hooks that may be Fished*

Vessels can't fish or possess more than 2,000 rigged hooks in the GOM RMA (§648.80(a)(3)(iv)(B)(2)), more than 3,600 rigged hooks in the GB RMA (§648.80(a)(4)(iv)(B)(2), more than 2,000 rigged hooks in the SNE RMA (§648.80(b)(2)(iv)(B)(1)), or more than 4,500 rigged hooks in the MA RMA (§648.80(c)(2)(v)(B)(1))). A 2002 interim action (67 FR 50292) initially implemented these hook limits as a way to control fishing effort. Amendment 13 made these limits permanent.

Sectors requested that their vessels be exempt from hook limits. With this exemption sectors seek to increase landings per trip by increasing the number of hook days associated with each trip.

7. *Length and Horsepower Restrictions on DAS Leasing*

Amendment 16 exempts sector vessels from the requirement to use Northeast Multispecies DAS to harvest groundfish. However, some sector vessels would still need to use Northeast Multispecies DAS when fishing for monkfish. The Monkfish FMP includes a requirement that limited access monkfish Category C and D vessels harvesting more than the incidental monkfish possession limit must fish under both a monkfish and a groundfish DAS. Therefore, sector vessels still use and lease Northeast Multispecies DAS. Multispecies vessels can currently lease DAS from other vessels provided that the vessel receiving the DAS has no more than 20% greater horsepower and/or is no more than 10% greater in baseline length of the lessee vessel (§648.82(k)(4)(ix). The DAS leasing restrictions maintain the character of the fleet and control groundfish fishing effort through vessel characteristics.

Sectors requested an exemption to allow DAS leasing within and between approved sectors that is not restricted by vessel characteristics. This leasing would occur for the purpose of complying with the Monkfish FMP. Sectors seek to expand the DAS leasing pool with this exemption.

8. *Prohibition on Discarding*

Sector vessels may not discard any legal-sized fish of the 15 allocated stocks (§ 648.87 (b)(1)(v)(A)). Amendment 16 contained this provision to ensure accurate monitoring of sector ACE.

Sectors requested a partial exemption from this prohibition due to operational and safety concerns. Vessels store the unmarketable catch on deck separate from food grade product. This takes up valuable deck and hold space while potentially creating unsafe working conditions for sector vessels at sea. Dealers typically absorb the cost associated with disposing of the unmarketable fish. The cost varies according to the amount and condition of the fish. The burden to the dealer is in labor and record keeping. This burden takes approximately 15 minutes per offload. Dealers often sell some of the damaged fish as bait to partially offset the cost of disposal. If high discard trips became a recurring event the dealer may decide to pass off some of the costs to the fisherman. However, this scenario is not likely to occur.

This regulatory exemption defines, “unmarketable” fish as “any legal-sized fish the vessel owner/captain elects not to retain because of poor quality as a result of damage prior to, or from, harvest.” The determination of what fish to discard is at the discretion of the vessel operator, but must be based on physical damage to the fish.

All vessels in a sector opting for this exemption would be required to discard all legal-sized unmarketable fish on all trips, with or without an observer on board. All legal-sized unmarketable allocated fish will be accounted for in the overall sector-specific discard rates through observer and at-sea monitor coverage. This is the same way discards of undersized fish are currently incorporated.

There is a financial incentive for vessel operators to retain and market as much of their catch of allocated stocks as possible. Since discarded fish still counts against the sector’s ACE and are incorporated into the sector’s discard rates, retaining fish maximizes the value a sector’s ACE.

This exemption would allow sector vessels to discard legal-sized unmarketable fish at sea. This exemption seeks to alleviate operational and safety concerns for sector vessels.

9. *Daily catch reporting by Sector Managers for Sector Vessels Participating in the Closed Area I Hook Gear Haddock Special Access Program*

Sector vessels submit daily reports to the Sector Manager while fishing in the Closed Area I Hook Gear Haddock SAP. The Sector Manager then compiles this information and submits it to NMFS (§ 648.85(b)(7)(v)(C)). Sectors can request an exemption from SAP reporting requirements but can’t request an exemption from any other reporting requirements.

Framework 40A implemented this reporting requirement to help NMFS monitor quota in real time. Amendment 16 alleviated reporting requirements for sector vessels participating in other Special Management Programs (SMPs). However, reporting requirements remained in place for the CA I Hook Gear Haddock SAP. This allowed NMFS to monitor the overall haddock TAC, which applies to sector and common pool vessels fishing in this SAP.

This exemption would relax the requirement that vessels submit a daily catch report to the Sector Manager and that the manager report directly to NMFS. Instead, the sector would require each vessel to submit its own report directly to NMFS via VMS. This exemption seeks to reduce the administrative burden on the sector. Further, because sector vessels must already submit VMS catch reports for operating in one or more Broad Stock Areas on the same trip, requiring similar reporting for the Closed Area I Hook Gear Haddock SAP would maintain consistency.

10. *Gear Requirements in the U.S./Canada Management Area*

The United States and Canada coordinate the management of several transboundary fisheries stocks in the U.S./Canada Management Area. These stocks include GB cod, GB haddock, and GB yellowtail flounder. The U.S./Canada Area consists of Eastern and Western sections. GB cod and GB haddock generally occur in the Eastern U.S./Canada Area while GB yellowtail flounder occur across the full U.S./Canada Management Area. The U.S./Canada Sharing Agreement establishes the amount of fish each country can harvest. The management objective for these shared stocks is to achieve but not exceed the U.S. fraction of the harvest (NEFMC 2003).

Current regulations require that a NE multispecies vessel fishing with trawl gear in the Eastern U.S./Canada Area fish with a Ruhle trawl, a haddock separator trawl, or a flounder trawl net (§ 648.85(a)(3)(iii)). Amendment 13 included provisions to constrain U.S. catches of the three shared stocks (69 FR 22906, 4/27/04). Historically, vessels tend to reach the TAC for GB cod first. Therefore, to help avoid exceeding the U.S. fraction, Amendment 13 required vessels to use gear designed to minimize the catch of cod. Amendment 13 restricted the use of trawl gear so that only the haddock separator trawl and the flounder trawl net could be in the Eastern U.S./Canada Area. Use of the Ruhle trawl, which also minimizes cod catch, was later approved through an in-season action in 2008 (73 FR 53158, 8/15/08), extended through an interim rule in 2009 (74 FR 17030, 4/13/09; 74 FR 55158, 10/27/09), and made permanent by Amendment 16.

Application of this gear requirement does not apply to the Western US/Canada Area (69 FR 22906, 4/27/04). Gear requirements in the Western U.S./Canada Area are not necessary since each of these three gear types affect cod selectivity, and the cod TAC is specific only to the Eastern U.S./Canada Area.

Sectors requested an exemption to allow their vessels to use any type of trawling gear while fishing in the U.S./Canada area. Sectors seek to increase catch rates of all allocated stocks with this exemption.

11. Requirement to Power a VMS While at the Dock

Vessels use a VMS unit to submit area declarations, hail reports, and catch information to NMFS. The VMS enables NMFS to monitor fishing vessel location, catch, DAS use, gear requirements, and trip limits (75 FR 18262, 4/9/10).

Per § 648.10(b)(4), groundfish vessels must have an approved and operational VMS on board:

- to fish on a Northeast Multispecies DAS
- to fish on a sector trip, or
- when a common pool vessel has declared their intent to fish in more than one broad stock area on the same trip.

Once a multispecies vessel declares its first DAS or sector trip, it must use a properly functioning VMS for the remainder of the fishing year. The VMS unit must transmit accurate positional information (i.e., polling) at least every hour, 24 hours per day, throughout the year (§ 648.10(c)(1)(i)). A limited access Northeast Multispecies vessel may power down its VMS only when done in accordance with the power down rules specified at § 648.10(c)(2).

Vessels can power down a VMS:

- if the vessel will be out of the water for more than 72 consecutive hours, or
- if the vessel does not participate in any fisheries and will not move from the dock/mooring for a minimum period of 30 consecutive days.

Powering down a VMS requires a letter of exemption from the NMFS Regional Administrator.

Sectors requested an exemption from keeping the VMS units powered while tied to the dock or on a mooring. This exemption seeks to reduce costs and energy consumption for sector vessels. Vessels granted this exemption and electing to power down must submit the appropriate VMS declaration, as specified on the sector's letter of authorization. Since sectors may only request exemptions from NE multispecies regulations, this exemption only applies to NE multispecies requirements. Therefore, if the vessel has permits for other FMPs, it must continue to comply with the requirements of those FMPs. For instance, a vessel in a sector granted this exemption that has a surfclam/ocean quahog permit would still need to have active VMS 24 hours a day, 7 days a week.

12. *Prohibition on Fishing Inside and Outside the Closed Area I Hook Gear Haddock SAP while on the Same Trip*

Multispecies vessels fishing on a trip within the Closed Area I Hook Gear Haddock SAP are prohibited from deploying fishing gear outside of the SAP on the same trip when they are declared into the SAP (§ 648.85(b)(7)(ii)(G)). This restriction was established to avoid potential quota monitoring and enforcement complications that could arise when a vessel fishes both inside and outside the SAP on the same trip (Framework Adjustment 40-A, 2004). This exemption would allow sectors vessels to fish both inside and outside the Closed Area I Hook Gear Haddock SAP on the same trip. To identify catch from inside and outside the SAP on the same trip, sector vessels would be required to send NMFS a catch report that specifically identifies GB Haddock (and any other shared allocation) catch from inside the SAP within 24 hours of landing or prior to the end of the trip. Sectors wish to increase their operational flexibility and efficiency with this exemption by having the opportunity to fish both inside and outside the SAP on the same trip.

13. *Prohibition on a Vessel Hauling Another Vessel's Hook Gear*

Current regulations prohibit one vessel from hauling another vessel's hook gear (§§ 648.14(k)(6)(ii)(B)). The regulations facilitate the enforcement of existing regulations as a single vessel is associated with each set of gear. Sectors have requested an exemption to the rules prohibiting hauling another vessels gear. The exemption would allow fishermen from within the same sector to haul each other's hook gear. However, all vessels participating in "community" fixed gear would be jointly liable for any violations associated with that gear. Additionally, each member intending to haul the same gear will be required to mark the gear consistent with §§ 648.14(k)(6)(ii)(B) and 648.84(a).

14. *Requirement to Declare Intent to Fish in the Eastern US/CA Area Haddock SAP and CA II Yellowtail/Haddock SAP Prior to Departure.*

Multispecies vessels are required to declare that they will be fishing in either the Eastern US/CA Haddock SAP or the CA II Yellowtail/Haddock SAP prior to leaving the dock (§ 648.85(b)(8)(v)(D) and § 648.85(b)(3)(v)). Framework 40A (2004) implemented this measure so that vessels fishing strictly in those areas could be credited days-at-sea (DAS) for their transit time to and from those SAPs. Sectors are requesting an exemption from having to declare their intent to fish in those areas because they are no longer limited by multispecies DAS and their catch is limited to their ACE. Therefore, this exemption will allow sector vessels to declare their intent to fish in these SAPs while at sea. Sectors seek to increase their efficiency with this exemption.

15. *Seasonal Restrictions for the Eastern US/CA Haddock SAP (Year Round Access)*

Multispecies vessels may fish in the Eastern US/CA Haddock SAP from August 1 through December 31 (50 CFR § 648.85(b)(8)(iv). The SAP was created to allow vessels to target a healthy stock of haddock while minimizing bycatch of other stocks. In particular, the seasonal restriction was put in place to lower cod and winter flounder catch rates through Framework Adjustments 40-A and 42, respectively (Framework Adjustment 40-A, 2004; Framework Adjustment 42, 2006). This exemption is being proposed by NMFS to exclude the use of the standard otter trawl. The rationale for this prohibition on otter trawl is to ensure that, consistent with the Councils intent, vessels would target healthy stocks and avoid stocks such as GB Cod and GB yellowtail flounder.

Sectors seek to increase their operational flexibility and efficiency with this exemption by having the opportunity to fish year-round in the SAP.

16. *Seasonal Restrictions for the CA II YT/Haddock SAP (Year Round Access)*

Multispecies vessels can fish in the Closed Area II Yellowtail/Haddock SAP from July 1 through December 31 to target yellowtail flounder, and from August 1 through January 31 to target haddock (§ 648.85(b)(3)(iii)). The seasonal restrictions were established to allow vessels to target denser populations of yellowtail flounder and haddock while avoiding cod in the summer and spawning groundfish in the spring (Framework 40-A, 2004; Amendment 13, 2004). While Amendment 16 gave sectors an exemption from trip limits for this SAP, it did not adjust the seasonal restrictions. This exemption is being proposed by NMFS to exclude the use of the standard otter trawl. The rationale for this prohibition is to ensure that, consistent with the Councils intent, vessels would target healthy stocks and avoid stocks such as GB Cod and GB yellowtail flounder.

Sectors seek to increase their operational flexibility and efficiency with this exemption by having the opportunity to fish year-round in the SAP.

17. EFP-like Exemption for Sampling

Regulations prohibit possession of fish below minimum fish sizes (§648.83), species under quota closures (§648.80, §648.81, §648.85), and fish in excess of possession limits (§648.86). Such fish must be immediately returned to the ocean. An exemption permitting temporary possession authorizes a federally permitted fishing vessel that is accompanied by an eligible research technician to temporarily retain fish that are not compliant with applicable fishing regulations to collect data (e.g., lengths and weights of discards). All non-compliant fish are returned to the sea as soon as practicable following data collection. This sampling exemption is not extended to species protected under the Endangered Species Act or Marine Mammal Protection Act.

Some sectors have proposed independent sampling programs, where data would be collected from fish that otherwise must be immediately discarded. This exemption request would allow these sectors interested in collecting the data to do so.

18. Access to Western Portion of Nantucket Lightship Closed Area

This measure would allow sector vessels to access portions of the Nantucket Lightship Closed area between 70° 00’W and 70° 20’W. Vessels would be authorized to use all legal trawl gear, hook gear, and gillnets with a 10-inch (25.4-cm) or larger diamond mesh. Gillnet vessels would be required to use pingers when fishing in the Nantucket Lightship Closed Area – Western Exemption Area in May, and December through April, 2015 and 2016, because this area lies within the existing Southern New England Management Area of the Harbor Porpoise Take Reduction Plan.

This exemption would impose no additional at-sea monitoring coverage for sector vessels fishing in the Western Nantucket Lightship Closed Area. However, vessels would have to declare their intent to fish in this area prior to departure. NMFS may elect to provide additional monitoring coverage if funds are made available. This exemption would allow sector vessels access to the western portion of the Nantucket Lightship Closed Area to target monkfish and skates.

Western Nantucket Lightship Closed Area

POINT	LATITUDE	LONGITUDE
A	40°50'N	70°20'W
B	40°50'N	70°00'W
C	40°20'N	70°00'W
D	40°20'N	70°20'W
A	40°50'N	70°20'W

19. Access to Eastern Portion of Nantucket Lightship Closed Area

This exemption would allow sector vessels to access portions of the Nantucket Lightship Closed Area between 69° 30’W and 69° 00’W. Trawl vessels would be restricted to selective trawl gear, including the separator trawl, the Ruhle trawl, the mini-Ruhle trawl, rope trawl, and any other selective trawl gear authorized by the Council in a management action. Flounder nets would be prohibited. Selective trawl gear would be required in the Eastern portion of the Nantucket Lightship Closed Area to minimize impacts to an important source sub-population of yellowtail flounder.

Vessels would also be allowed to use hook gear and gillnets with a 10-inch (25.4-cm) or larger diamond mesh. Gillnet vessels would not be required to use pingers when fishing in the Nantucket Lightship Closed Area – Eastern Exemption Area. This exemption would allow sector vessels access to the eastern portion of the Nantucket Lightship Closed Area to target monkfish and skates.

Eastern Nantucket Lightship Closed Area

POINT	LATITUDE	LONGITUDE
A	40°50'N	69°30'W
B	40°50'N	69°00'W
C	40°20'N	69°00'W
D	40°20'N	69°30'W
A	40°50'N	69°30'W

20. 5.5-inch Mesh Size or Greater for Directed Redfish Trips *(novel exemption for FY 2015/16)*

Minimum mesh size restrictions (§ 648.80(a)(3)(i), (a)(4)(i), (b)(2)(i), (c)(2)(i)) were implemented under Amendment 13 (69 FR 22906, 4/27/04) in conjunction with other management measures, including Framework 42 (FW 42) (71 FR 62156, 10/23/06), to reduce overall mortality on groundfish stocks, change the selection pattern of the fishery to target larger fish, improve survival of sublegal fish, and allow sublegal fish more opportunity to spawn before entering the fishery. Beginning in FY 2012, sectors were allowed to use a 6-inch codend to target redfish in the Gulf of Maine. Subsequently, at the end of FY 2012 and into FY 2013, sectors were allowed to use a 4.5-inch codend to target redfish provided that 80-percent or greater of their groundfish landings were redfish and no more than 5 percent of total catch was groundfish discards (including redfish). For FY 2014, NMFS allowed sector vessels to use a 6-inch mesh, or larger, codend to target redfish with the 80-percent threshold of groundfish landings and 5 percent threshold of groundfish discards.

This year’s exemption is similar to prior redfish exemption requests. The vessels participating in the redfish fishery would be subject to the same Northeast Fisheries Observer Program (NEFOP) and at-sea monitor coverage as standard groundfish trips (i.e., less than 100 percent of trips would be monitored). A vessel would be required to declare its intent to use a 5.5-inch cod end to target redfish by submitting a Trip Start Hail through its VMS unit prior to departure. The hail would be used for monitoring and enforcement purposes. Trips declaring the redfish exemption would have separate discard rates for both the large mesh and small mesh portion of their trip, separate from trips that do not declare the exemption. The vessel trip report would be used to identify whether or not the 5.5-inch mesh was actually used on the trip. If a vessel declares the exemption but does not use the 5.5-inch mesh on a trip,, the restrictions associated with the exemption (e.g., thresholds) do notapply. The thresholds only apply to the portions of each trip that utilize the 5.5 inch mesh.

Under this exemption, vessels must fish as described below:

1. Vessels must declare their trip into the observer program under standard requirements, but there are no additional monitoring requirements above the target coverage for the groundfish fishery (i.e., ~26% in FY 14)

2. Prior to leaving the dock, any vessel that intends to use the redfish exemption on a trip must declare so through the VMS system. This notification must be made if the vessel intends to use 5.5 codend or larger to target Redfish on any portion of the trip.

3. Any vessel declaring this must submit catch reports each day for the entire trip, including Parts 1 and 2 of the trip as described below.

4. Vessels can use a 5.5 inch mesh and greater codend within the Redfish Exemption Area. The northern boundary ensures that the exemption is used in deeper water (i.e., greater than 50 fathoms). The "cod closure" consists of block 131, and would be closed seasonally in February and March due to concerns about GOM cod.

- *Part 1 of Trip*

5. Vessels may fish using a 6.0 inch mesh codend with selective gear in the GB Broad Stock Area (BSA; current mesh flexibility allowed from Council exemption est. in 2010) or 6.5 inch mesh codend in any BSA, including the Gulf of Maine. If a vessel intends to target redfish for their entire trip, the requirements given in the following steps 6-8 do not apply.

6. Any sub-legal codend must be stowed below deck for the entire portion of the trip (transiting and fishing) using the current mesh flexibility, i.e. any codend below 6.0 inches when fishing with selective gear in the GB BSA and any codend below 6.5 inches when fishing with standard trawl gear in any BSA.

7. Once the vessel plans on switching codends to direct on redfish, they must first transit to the Redfish Exemption Area. Once the vessel is in the Redfish Exemption Area, they must declare that their vessel is switching to the 5.5 inch mesh codend (or larger) and will be conducting the remainder of their fishing activity for the trip exclusively in the Redfish Exemption area. The vessel can then retrieve the 5.5 inch mesh codend from below deck and begin using it.

Any catch thresholds do not apply for Part 1 of the trip.
Part 2 of Trip

8. Once the vessel is in the Redfish Exemption Area and declares a codend switch via VMS, it may retrieve the 5.5 inch mesh codend from below deck and begin using it. The vessel may use a 5.5 inch mesh codend (or greater) for the remainder of the trip in Redfish Exemption Area.

9. All fishing activity for the remainder of the trip may only occur in the Redfish Exemption area.

10. For all trips targeting redfish under Part 2 of the trip, at least 50 percent of the total allocated groundfish kept must be redfish, and;

11. For observed trips (NEFOP/ASM) targeting redfish under "Part 2" of the trip, total groundfish discards of allocated stocks (including redfish) from Part 2 of the trip may not exceed 5 percent of all kept fish (K_{all}).

12. The vessel must submit a final catch report and a Trip End Hail via VMS at the end of the trip.

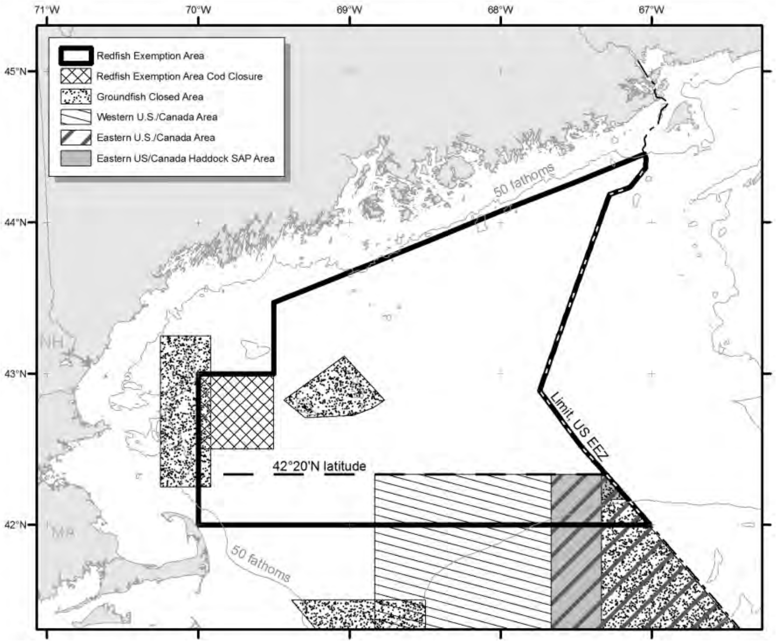


Figure 1. Proposed Redfish Exemption Area

The Redfish Exemption Area is bounded on the east by the U.S.-Canada Maritime Boundary, and bounded on the north, west, and south by the following coordinates, connected by straight lines in the order listed:

Point	N. Lat.	W. Long.	Note
A	44°27.25'	67°02.75'	
B	44°16.25'	67°30.00'	
C	44°04.50'	68°00.00'	
D	43°52.25'	68°30.00'	
E	43°40.25'	69°00.00'	
F	43°28.25'	69°30.00'	
G	43°00.00'	69°30.00'	
H	43°00.00'	70°00.00'	
I	42°00.00'	70°00.00'	
J	42°00.00'	(67°00.63')	(1)

(1)The intersection of 42°00' N. latitude and the U.S.-Canada Maritime Boundary, approximate longitude in parentheses.

Due to concerns about GOM cod, we have modified the redfish exemption area to exclude block 138 for the entire fishing year, and include block 131 as a seasonal closure. The area is bounded on the east, north, west, and south by the following coordinates, connected by straight lines in the order listed:

Point	N. Lat.	W. Long.
G	43°00.00'	69°30.00'
H	43°00.00'	70°00.00'
K	42°30.00'	70°00.00'
L	42°30.00'	69°30.00'
G	43°00.00'	69°30.00'

Reporting Requirements: Vessels will be required to submit unique VTRs per standard requirements, such as when they switch chart area, gear, and/or mesh size. The mid-trip "declaration" is primarily for enforcement purposes, to notify OLE/USCG that the vessel will retrieving its smaller codend from below deck, rather than allowing vessels to have the codend readily available on a second net reel.

Internal Sector Monitoring: The Sector will develop internal monitoring procedures that utilize to the extent practicable the same mathematical calculations adopted by the Agency to determine whether the sector is meeting either of the catch thresholds for redfish trips (as identified in the Trip Start Hail). The Sector acknowledges that ultimately the Agency will provide its own analysis that show whether the thresholds are being met.

Agency Sector Monitoring: Upon notification by the Agency that the Sector has not been meeting either of the catch thresholds, the Sector will be afforded one month (i.e. 30 days) to get into compliance. In the event the Sector fails to come into compliance with the catch thresholds, the Sector acknowledges that the Agency may withdraw authorization of this exemption to the Sector.

21. 6.5 inch Trawl Mesh Size Requirement to Target Small Mesh Species (silver hake, red hake, and squid) While on a Sector Trip in the SNE RMA

Minimum mesh size restrictions for the GOM, GB, and SNE RMAs (§ 648.80(a)(3)(i), (a)(4)(i), (b)(2)(i)) were implemented under Amendment 13 (69 FR 22906, 4/27/04) in conjunction with other management measures, including FW 42 (71 FR 62156, 10/23/06), to reduce overall mortality of groundfish stocks, change the selection pattern of the fishery to target larger fish, improve survival of sublegal fish, and allow sublegal fish more opportunity to spawn before entering the fishery.

FW 42 set requirements for trawl codends in the SNE RMA to be made of either square or diamond mesh no smaller than 6.5 inches. The minimum mesh requirements implemented by FW 42 were intended to reduce discards of yellowtail flounder thereby increasing the rate of yellowtail flounder rebuilding. Since the yellowtail flounder stock was not rebuilding quickly, even small improvements in rebuilding were considered important. Framework 48 (78 FR 18188, 3/25/13) updated the status of the SNE/MA stock of yellowtail flounder to rebuilt based on the results of SARC 54 in June 2012.

Small-mesh trawl gear is currently permitted within several exempted fisheries. These fisheries allow vessels to fish for specific species, such as whiting or squid, in designated, areas using mesh sizes smaller than the minimum mesh size allowed under the Regulated Mesh Area (RMA) regulations. No one may fish using a mesh smaller than those set in the regulations above unless they are eligible to participate in, and comply with all of the requirements of, a specific exempted fishery. To be approved and implemented by the Regional Administrator, exempted fisheries must have demonstrated that incidental catch of regulated species is less than 5 percent of the total catch, by weight, and that the exemption will not jeopardize fishing mortality objectives.

For FY 2014 NMFS approved an exemption that would allow their vessels to possess and use small mesh and large mesh on a single trip within portions of the SNE RMA. Sectors requested this exemption to allow a vessel to engage in exempted fisheries while on a sector trip, to increase efficiency of fishing effort and gross revenue per trip, while decreasing vessel operating costs.

In 2013 a similar exemption request was disapproved due to monitoring and enforcement concerns. Those concerns included the possibility that, through this exemption, a vessel could circumvent the regulations and target allocated NE multispecies with small mesh, and therefore increase catch of juvenile fish, negatively affecting fish stocks. To address this concern, the sectors proposed that vessels using this exemption would be required to use trawl gear with one of the following gear modifications:

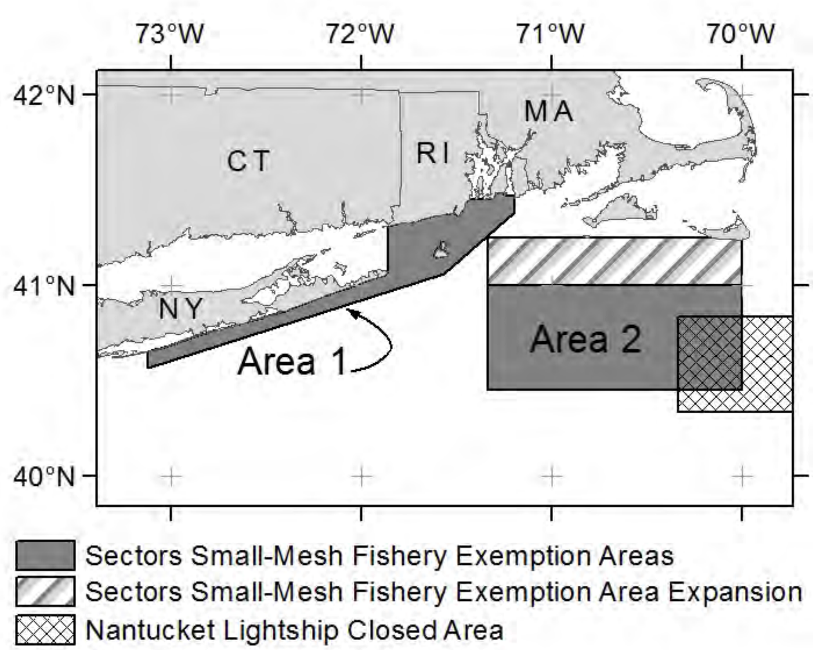
- drop chain sweep – minimum of 12” in length;
- large mesh belly panels – minimum of 32” mesh size; or
- excluder grate secured forward of the codend with an outlet hole forward of the grate – bar spacing of no more than 1.97” wide.

NMFS believs that these gear modifications should eliminate the incentive for a sector vessel using this exemption to target groundfish, and could reduce possible bycatch of groundfish as these gear modifications have been shown to reduce, but not eliminate, the catch of legal and sub-legal groundfish stocks. However, the use of a drop chain sweep could increase groundfish catch if it is not properly configured. For 2015 /16, the exemption's northern boundary is being expanded slightly to 41 degrees 15 mintues. This expansion will allow for greater opportunities to target small mesh species.

A vessel using this exemption would be subject to the same NEFOP and at-sea monitoring coverage as standard groundfish trips (i.e., less than 100 percent of trips would be monitored). Trips declaring this exemption could only use small mesh in specific areas (see maps and coordinates below). The large mesh must be used first. After hauling the large mesh gear, the vessel would have to submit a Multispecies Catch Report via VMS, listing all catch on board at that time. After the submission of the VMS Catch Report, the vessel would be authorized to deploy small mesh, and the large mesh could not be redeployed. The vessels would be required to declare their intent to use small mesh to target non-regulated species by submitting a Trip Start Hail through its VMS unit prior to departure; this would be used for monitoring and enforcement purposes. Each time the vessel switches mesh size or statistical area, it must fill out a new VTR. Any legal-sized allocated groundfish stocks caught during these small mesh hauls would be landed and the associated landed weight (dealer or VTR) would be deducted from the sector's ACE.

Vessels using this exemption would have their trips assessed with a new discard strata treated separately than sector trips that do not declare this exemption. After one year, an analysis would be conducted to determine whether large mesh hauls on these trips should remain a separate stratum or be part of existing strata. On unobserved trips, the weight of the kept catch from these small mesh hauls would be included in the K_{all} computation for the assumed discard calculation. On observed trips, the weight of any observed discards of allocated groundfish stocks would be charged to the Sector's ACE for the trip. The weight of these observed discards as well as the total weight of the observed kept catch (observed K_{all}) on the small mesh hauls will be included in the calculation of the sector's discard rate for unobserved trips using this exemption.

Figure 2. Sector Small Mesh Fishery Exemption Areas



Sectors Small-Mesh Fishery Exemption Area 1 is meant to provide exemption access within five miles of the southern shore of Long Island and within five miles of Block Island. The primary target would be squid in late spring. It is bounded by the following coordinates connected in the order listed by straight lines, except where otherwise noted:

Sectors Small-Mesh Fishery Exemption Area 1 is bounded by the following coordinates connected in the order listed by straight lines, except where otherwise noted:

POINT	LATITUDE	LONGITUDE
A	40°39.2'N	73°07.0'W
B	40°34.0'N	73°07.0'W
C	41°03.5'N	71°34.0'W
D	41°23.0'N	71°11.5'W
E	41°27.6'N	71°11.5'W (1)
F	41°18.3'N	71°51.5'W
G	41°04.3'N	71°51.5'W (2)
A	40°39.2'N	73°07.0'W

(1) From POINT E to POINT F along the southernmost coastline of Rhode Island and crossing all bays and inlets following the COLREGS Demarcation Lines defined in 33CFR§80.

(2) From POINT G to POINT A along the southernmost coastline of Long Island, NY and crossing all bays and inlets following the COLREGS Demarcation Lines defined in 33CFR§80.

Sectors Small-Mesh Fishery Exemption Area 2 is bound by the following coordinates connected in the order listed by straight lines.

POINT	LATITUDE	LONGITUDE
H	41°15.0'N	71°20.0'W
I	41°15.0'N	70°00.0'W
J	40°27.0'N	70°00.0'W
K	40°27.0'N	71°20.0'W
H	41°15.0'N	71°20.0'W

Sectors Small-Mesh Fishery Exemption Area 2 overlaps the Nantucket Lightship Closed Area. Small mesh is not permitted in the closed area. Further, the exemption to allow access to the closed area does not propose to allow small mesh. Accordingly, we are only proposing to grant this exemption in the portion of the proposed area that does not overlap the Nantucket Lightship Closed Area. For 2015/16, the exemption's northern boundary is being expanded slightly to 41 degrees 15 mintues. This expansion will allow for greater opportunities to target small-mesh species. Data indicate the groundfish catch in this expanded area is not likely to be substantially different than in 2013.

3.3.1 No Action Alternative 2

The No Action for Alternative 2 would not approve one or more of the sector -specific exemptions. The No Action would apply independently to each exemption. Under the No Action, sectors would not be exempt from the specific regulations, and would continue to follow the current regulations.

3.4 ALTERNATIVES CONSIDERED BUT REJECTED FROM FURTHER ANALYSIS

Amendment 16 established the rules for sector exemptions (§648.87 (b)(1)(xvi) & § 648.87(c)(2)). Sectors cannot request exemptions from:

1. permitting restrictions
2. gear restrictions designed to minimize habitat impacts
3. certain reporting requirements
4. regulations outside of the Northeast Multispecies FMP

Given these prohibitions, NMFS considered several exemptions, but rejected them for further analysis. These included, but were not limited to, exemptions from internal NMFS policy, reporting requirements related to observer coverage, discard calculation methodology, and confidentiality. Unless sectors provided new information or data in their FY 2015/16 requests, NMFS also rejected most exemptions it disapproved for FY 2010 through FY 2014.

4.0 AFFECTED ENVIRONMENT

4.1 BACKGROUND SECTOR DATA FOR MULTIPLE VECS

4.1.1 Introduction to Sector Data

FY 2010 marked the first year that the sector program was allocated the majority of the commercial groundfish sub-ACLs and the first year the sector program was responsible for the overwhelming majority of groundfish landings. This document includes sector data from FY 2010 through FY 2013. Data from FY 2009 is also included for vessels that were sector members in FY 2010. This approach informs the analysis and provides a baseline for the public to better understand the operation of the sector fishery. It is possible that differences in totals between data presented in prior Sector EAs for previous years could differ from the data presented in this EA. Differences are due to updates to the source data (VTR database and Data Matching and Imputation database (DMIS)) as well a minor modification to the sector membership algorithm. Sector membership is now based on MRI rather than vessel permit number. The reason for this is that the MRIs within a sector do not change during the fishing year, whereas a vessel permit (permanently associated with a particular hull) may move into or out of a sector (although this is uncommon). Hence, MRI is a more reliable means of tracking sector membership.

> ***What's in Section 4?***
>
> This section describes the environment of the area
> proposed action and alternatives. NMFS identifie
> Ecosystem Components (VECs) which are the im
> environmental facets used to evaluate impacts in
> section contains background data for multiple VE
> to FY 2013. It then has subsections describing ea
> VECs include:
>
> - Physical environment/Essential Fish Hab
> - Allocated target species
> - Non-allocated target species and bycatch
> - Protected resources
> - Human communities

For the purpose of this EA, and for the management of the sector fishery, the Greater Atlantic Regional Fisheries Office defines a "groundfish trip," as a sector trip where groundfish is landed, and applied to a sector ACE. This definition differs from other methods of defining a groundfish trip. Other methodologies use a sector VMS declaration to define a groundfish trip 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 in this section, and elsewhere in the document, from vessel trip reports (VTR). The Greater Atlantic Regional Fisheries Office used VTR data because it contains effort data, and gear and positional information. NMFS took some of the data in the document, such as that concerning protected resources, from the Northeast fisheries observer data set. It is important that the reader be informed 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 Northeast Fishery Science Center, and from data published for other uses.

The EA analysis uses complete data sources. As such, we excluded trips with undefined gear, missing land dates, missing sector membership, and trips that did not submit a VTR. 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 multiple years in order to determine the impacts of sector management. 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 are matched 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.
- Since the EA analyses seek to determine the effect of sector management, it focuses on the activity of vessels which were sector members. For the purpose of quota monitoring, sector membership is determined at the time of each landing.
- 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.

4.1.2 Annual Catch Entitlement Comparison

As stated in Section 1.1.1, each sector receives a total amount (in pounds) of fish it can harvest for each stock. This amount is the sector's Annual Catch Entitlement (ACE). 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 commercial groundfish sub-ACL to get the sector's ACE. Since the annual ACE is dependent on the amount of the ACL for a given fishing year, the ACE may be higher or lower from year to year even if the sector's membership remained the same. As seen in Table 4, there are substantial shifts in ACE for various stocks between FY 2009 and FY 2014. ACL was reduced 15.23 percent in FY 2014 over FY 2013. It is expected that in FY 2015, ACL will continue to decline for several stocks in critical condition, namely GOM cod. As seen in the below data, there has been a general decrease in trips, and catch for sector vessels. In addition, 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 overall decrease in ACLs coupled with the shift from the DAS to the sector system.

Table 4. Commercial Groundfish Sub ACL FY 2009 to FY 2014

Groundfish Stock	FY 2009 target/hard TAC (lbs)	FY 2010 ACL (lbs)	% Change 2009 to 2010	FY 2011 ACL (lbs)	% Change 2010 to 2011	FY 2012 ACL (lbs)	% Change 2011 to 2012	FY 2013 ACL (lbs)	% Change 2012 to 2013	FY 2014 ACL (lbs)	% Cha 2013 to
GB Cod East	1,161,836	745,162	-35.86%	440,925	-40.83%	357,149	-19.00%	202,825	-76.09%	326,284	60
GB Cod West	10,965,793	6,816,693	-37.84%	9,041,157	32.63%	9,795,138	8.34%	3,780,928	-159.07%	3,573,693	-5
GOM Cod	23,642,373	10,068,512	-57.41%	10,637,304	5.65%	4,310,037	-59.48%	1,829,837	-135.54%	1,829,837	
GB Haddock East	24,471,311	26,429,016	8.00%	21,252,562	-19.59%	15,167,804	-28.63%	8,276,153	-83.27%	22,055,045	166
GB Haddock West	171,861,356	62,725,923	-63.50%	46,164,798	-26.40%	45,322,632	-1.82%	57,752,636	21.52%	15,800,530	-72
GOM Haddock	3,448,030	1,818,814	-47.25%	1,715,196	-5.70%	1,439,619	-16.07	412,264	-249.20%	961,215	133
GB Yellowtail Flounder	3,564,875	1,814,404	-49.10%	2,517,679	38.76%	479,946	80.94%	257,500	-86.39%	561,076	117
SNE/MA Yellowtail Flounder	857,598	683,433	-20.31%	1,155,222	69.03%	1,675,513	45.04%	1,256,635	-33.33%	1,243,407	-1
CC/GOM Yellowtail Flounder	1,895,975	1,717,401	-9.42%	2,072,345	20.67%	2,306,035	11.28%	1,055,908	-118.39%	1,056,014	0
American Plaice	7,085,657	6,278,765	-11.39%	6,851,967	9.13%	7,226,753	5.47%	3,130,529	-130.85%	3,046,788	-2
Witch Flounder	2,489,019	1,878,338	-24.53%	2,724,914	45.07%	3,192,294	8.34%	1,344,725	-137.39%	1,344,820	0
GB Winter Flounder	4,418,064	4,082,961	-7.58%	4,424,678	8.37%	7,467,057	68.76%	7,777,909	4.00%	7,462,648	-4
GOM Winter Flounder	835,552	348,330	-58.31%	348,330	0.00%	1,576,305	352.53%	1,575,685	-0.04%	1,575,644	
SNE/MA Winter Flounder	0	Not Allocated	NA	Not Allocated	NA	Not Allocated	NA	2,667,593	NA	2,667,593	
Redfish	18,990,619	15,092,846	-20.52%	16,625,059	10.15%	18,653,483	10.4	22,336,999	16.49%	23,291,838	4
White Hake	5,238,183	5,635,015	7.58%	6,556,548	16.35%	7,237,776	10.39%	8,485,592	14.71%	9,431,376	11
Pollock	13,990,535	36,493,118	160.84%	30,758,895	-15.71%	27,804,700	-9.60%	28,425,081	2.18%	29,153,930	2
Totals	**294,916,777**	**182,628,733**	**-38.07%**	**163,287,579**	**-10.59%**	**153,712,242**	**-5.86%**	**147,901,206**	**-3.93%**	**125,381,739**	**-15**

4.1.3 Introduction to Sector Fishing Data

In general, overall data are consistent for sector vessels between FY 2009 and FY 2014 However, there are major differences in trips, catch and geardays when looking at what fisheries the sector vessels are participating in. The following tables present this data.

There are several methods used to measure fishing effort. These include:

- the number of trips to fishing grounds
- the length of the trips
- the amount of gear used on a trip
- the length of time that the gear was in the water fishing, and
- the size of the gear.

Catch per unit of effort is a widely used measure of how efficient a vessel is at catching fish. This analysis uses a "gearday" as a proxy for catch per unit effort. We define a gearday as a 24 hour approximation of the amount of gear in the water multiplied by several factors including gear size, hauls, and soak time. This can be expressed mathematically as:

$$\text{GEAR DAY} = \frac{\text{(GEAR QUANTITY) x (GEAR SIZE) x (\# OF HAULS) x (SOAK OR TOW TIME)}}{\text{24 HOURS}}$$

The definition of gear quantity, gear size, number of hauls and soak/tow time are consistent with the definitions found in the VTR reporting instructions. Table 5 presents these definitions.

Table 5. VTR Fishing Effort Definitions by Gear Type

Trawls	Gear Quantity:	number of trawls
	Gear Size:	sweep (foot rope) length in feet
	# of Hauls:	number of tows hauled per trip
	Tow/Soak Time:	time gear is completely hooked up to when gear is completely hauled back
Dredge	Gear Quantity:	number of dredges
	Gear Size:	dredge width in inches
	# of Hauls:	number of tows hauled per trip
	Tow/Soak Time:	time gear is completely hooked up to when gear is completely hauled back
Gillnet	Gear Quantity:	average number of nets per string
	Gear Size:	average length of the nets used in the string (not the entire string)
	# of Hauls:	number of strings hauled per tip
	Tow/Soak Time:	from when the first piece of gear is deployed until the last piece of gear is hauled back
Longline	Gear Quantity:	number of hooks
	Gear Size:	N/A*
	# of Hauls:	number of lines hauled per trip
	Tow/Soak Time:	from when the first piece of gear is deployed until the last piece of gear is hauled back
Pots	Gear Quantity:	average number of pots per string
	Gear Size:	total number of pots in the water
	# of Hauls:	number of strings hauled per trip
	Tow/Soak Time:	from when the first piece of gear is deployed until the last piece of gear is hauled back

* VTR Instruction Table #3 does not specify a reporting method for longline.

4.1.4 Data from All Trips Fished by Sector Vessels

The following tables compare trips, catch, and geardays for sector vessels during FY 2009 through FY 2013. The data in Section 4.1.4 is not confined to groundfish trips, but includes information for catch, trips, and geardays from all trips taken by these vessels, whether on a groundfish trip or a non-groundfish trip (i.e., lobster fishing).

4.1.4.1 Overall Trends in Catch, Trips, and Geardays by Sector Vessels Fishing on Any Trip

Table 6. Overall Trips, Catch, and Geardays for Sector Vessels Fishing on All Trips

Fishing Year	Trips	Catch (lbs)	Geardays*	Non-Lobster Geardays	Lobster Geardays
2009	33,565	174,819,879	5,399,664,586	351,855,642	5,047,808,944
2010	27,424	157,659,041	6,327,590,015	280,412,706	6,047,177,309
2011	31,376	195,186,641	9,648,515,194	374,797,304	9,273,717,890
2012	31,494	189,653,351	9,096,310,772	410,854,262	8,685,456,510
2013	27,796	183,384,739	9,969,900,386	372,069,398	9,597,830,989

* Lobster pots primarily account for the increase in overall geardays

Table 6 illustrates total trips (including groundfish trips) taken by sector vessels. Due to the higher numbers of quantity and soak time, increases in effort with fixed gear (e.g., gillnets, longlines, pots) are likely disproportionately higher than an increase (or decrease) in effort by trawl vessels. While the overall non-lobster geardays increased slightly between FY 2009 and FY 2013, there are differences in trends between gear types (see Table 7 through Table 11), and variability throughout the years. Therefore, when reviewing geardays, it is more informative to analyze trends within individual gear types (e.g., gillnet, trawl, longline, etc.) for a sense of how gear was used in a given fishing year than to examine overall changes. A comparison that combines geardays from different gear types is not as informative since the gears are all fished differently, and cumulative comparisons should not be made.

4.1.4.2 All Trips - Data Trends Across Gear Types

Gillnet Gears

Table 7. Overall Trips, Catch, and Geardays for Sector Vessels Fishing on All Trips with Gillnet Gear

Fishing Year	Trips	Catch (lbs)	Geardays
2009	10,933	30,818,877	320,712,367
2010	6,458	20,444,101	246,828,424
2011	7,966	23,836,050	329,344,165
2012	6,998	22,688,260	349,889,249
2013	5,015	15,638,781	310,752,176

Trips and catch fell substantially for gillnet vessels, while geardays fell marginally.

Trawl Gears

Table 8. Overall Trips, Catch, and Geardays for Sector Vessels Fishing on All Trips with Trawl Gear

Fishing Year	Trips	Catch (lbs)	Geardays
2009	16,457	138,290,539	2,635,703

2010	13,754	131,516,962	2,400,718
2011	14,310	163,855,793	2,737,806
2012	14,861	157,001,915	2,769,485
2013	13,159	157,011,891	2,556,350

Table 8 shows how vessels that fished with trawl gear operated. For the period FY 2009 through FY 2013, trips and geardays fell while catch rose slightly.

Longline Gears

Table 9. Overall Trips, Catch, and Geardays for Sector Vessels Fishing on All Trips with Longline Gear

Fishing Year	Trips	Catch (lbs)	Geardays
2009	703	2,441,161	8,024,182
2010	563	1,712,628	8,114,058
2011	795	1,841,855	5,275,658
2012	891	1,835,906	786,780
2013	406	1,197,054	122,002

Table 9 shows the operation of vessels fishing with longlines. This gear type includes both bottom and pelagic longlines. Catch and geardays fell substantially from FY 2009 to FY 2013. The substantial increase in geardays within the longline fleet in FY 2010 was caused by a small number of vessels that reported geardays upward of 230 million, while the overwhelming majority of the longline vessels reported gearday decreases of between 0 and 500,000 from FY 2009 to FY 2013. The longline decline between 2012 and 2013 was primarily due to changes in the sectors that historically contributed the most to longline effort. That decline was the result of effort shifting to participation in other fisheries.

Pots

Table 10. Overall Trips, Catch, and Geardays for Sector Vessels Fishing on All Trips with Pot Gear

Fishing Year	Trips	Catch (lbs)	Geardays	Non-Lobster Geardays	Lobster Geardays
2009	4,405	2,828,660	5,068,266,642	20,457,698	5,047,808,944
2010	5,497	3,402,805	6,070,246,054	23,068,745	6,047,177,309
2011	7,384	5,051,680	9,311,155,987	37,438,097	9,273,717,890
2012	7,872	6,434,637	8,741,310,119	57,398,009	8,683,912,110
2013	8,438	6,815,123	9,629,278,392	58,626,748	9,570,651,645

Table 10 shows the operation of vessels fishing with pots. These gears include lobster, shrimp, crab, fish, and other pots. Trips, geardays, and catch have increased from FY 2009 to FY 2013. Much of this is due to a shift of effort by sector vessels that held lobster permits fishing more in the lobster fishery.

Other Gears

Table 11. Overall Trips, Catch, and Geardays for Sector Vessels Fishing on All Trips with Other Gear Types

Fishing Year	Trips	Catch (lbs)	Geardays
2009	1,089	440,642	25,693
2010	1,175	582,545	762
2011	941	601,263	1,578
2012	906	1,692,633	10,739
2013	789	2,721,890	12,084

The other gears category consists primarily of handgear.

4.1.4.3 Data Trends by Location – Regulated Mesh Area (RMA)

Table 12. Overall Trips, Catch, and Geardays for Sector Vessels by RMA

	Fishing Year	Trips*	Catch (lbs)	Geardays	Non-Lobster Geardays	Lobster Landings from Non-Lobster Geardays	Lobster Geardays
GB	2009	4,551	55,306,271	1,615,143,389	58,444,622	632,863	1,556,698,768
	2010	4,892	51,341,837	1,606,312,810	43,039,358	487,390	1,563,273,452
	2011	4,996	52,353,735	1,998,282,143	44,425,549	579,062	1,953,856,594
	2012	4,793	41,592,063	1,380,452,918	39,028,911	536,761	1,341,424,008
	2013	4,399	42,731,717	1,491,373,491	33,370,379	446,621	1,458,003,112
GOM							
	2009	21,635	58,943,883	3,461,055,685	209,227,320	237,390	3,251,828,365
	2010	15,269	44,216,308	4,407,755,488	156,794,407	169,761	4,250,961,081
	2011	18,183	56,306,809	7,470,084,265	215,072,852	234,569	7,255,011,413
	2012	18,070	58,380,096	7,059,557,895	209,901,611	233,465	6,849,656,284
	2013	14,519	63,091,331	7,627,953,808	188,937,114	183,325	7,439,016,694
MA							
	2009	572	9,430,952	6,208,735	6,042,626	2,319	166,109
	2010	635	7,155,190	9,871,997	6,582,417	24,042	3,289,581
	2011	524	18,226,772	11,378,142	5,924,066	149	5,454,075
	2012	424	21,979,637	4,765,517	4,765,517	7	-
	2013	404	9,419,343	3,051,718	3,051,718	25	-
UNK							
	2009	72	364,846	57,634	57,634	10,139	-
	2010	55	539,897	65,788	65,788	8,658	-
	2011	80	835,156	117,575	117,575	10,943	-
	2012	138	3,150,075	6,613,490	275,802	5,958	6,337,689
	2013	95	825,645	351,229	351,229	9,377	-
SNE							
	2009	6,853	50,773,927	317,199,143	78,083,440	16,303	239,115,703
	2010	7,138	54,405,809	303,583,932	73,930,737	15,047	229,653,195
	2011	8,324	67,464,169	168,653,070	109,257,261	11,697	59,395,809

	2012	8,700	64,551,480	644,920,952	156,882,422	7,035	488,038,530	
	2013	9,091	67,316,703	847,170,141	146,358,958	8,336	700,811,183	
Total								
	2009	33,565	174,819,879	-	-	899,014	-	
	2010	27,424	157,659,041	-	-	704,898	-	
	2011	31,376	195,186,641	-	-	836,420	-	
	2012	31,494	189,653,351	-	-	783,226	-	
	2013	27,796	183,384,739	-	-	647,684	-	
* Note area trip counts may exceed the grand total trip count because trips may fish in multiple areas.								

As is seen in the location data, trips were down in the GOM RMA, while catch was constant in MA RMA. The increases in geardays in most RMAs is likely due to a shift of effort into the lobster fishery or from lobster vessels with a small groundfish allocation enrolling in sectors, as can be seen in the increase in pot geardays as shown in Table 10.

There are two likely reasons for the increase in lobster gear days. First, sector vessels that primarily target lobster may have increased their geardays. Lobster vessels with a NE multispecies permit must enroll in a sector to receive any allocation associated with that permit. Therefore, if these lobster vessels increased their effort, it would appear that sectors were increasing their lobster effort. However, this would not be the case because these vessels had targeted lobsters in previous fishing years. Thirty three sector vessels landed mostly lobsters in FY 2010 while 51 sector vessels landed mostly lobsters in FY 2011. Second, of the 51 lobster vessels in sectors in FY 2011, 16 were not in a sector the previous year but were lobster vessels in either FY 2010 or FY 2009. Data on lobster catch and geardays are relatively constant through FY 2013. As a result, much of the gearday increase that is seen is due to lobster vessels enrolling in sectors, not due to sector vessels switching effort from groundfish into lobster. Importantly, only 5 vessels enrolled in sectors switched from groundfishing FY 2010 to lobstering in FY 2011. In conclusion, the increase in lobster geardays is not from an effort shift from groundfish vessels but from an increase by lobster vessels that are enrolled in sectors.

4.1.4.4 Seasonal Data Trends

Table 13 - Seasonal Trips, Catch, and Geardays for Sector Vessels

	Fishing Year	Trips	Catch (lbs)	Geardays	Non-Lobster Geardays	Lobster Landings from Non-Lobster Geardays	Lobster Geardays	Lobster Landings on Lobster Geardays
SPRING								
	2009	5,495	33,478,590	1,026,829,575	66,905,527	257,015	959,924,048	83,920
	2010	4,756	35,529,570	1,108,489,170	70,568,396	196,752	1,037,920,775	113,945
	2011	5,417	37,023,756	1,757,333,701	82,173,350	251,279	1,675,160,351	221,605
	2012	5,526	36,638,975	1,786,147,543	89,075,306	209,340	1,697,072,237	198,145

	2013	4,767	31,810,140	1,817,564,977	93,718,150	137,998	1,723,846,826	226,671
SUMMER								
	2009	11,069	55,970,355	1,441,381,860	125,090,090	270,912	1,316,291,770	486,335
	2010	9,420	47,382,408	1,816,301,964	109,130,724	207,362	1,707,171,240	737,691
	2011	10,806	69,594,330	2,565,927,713	121,573,429	223,621	2,444,354,284	1,030,194
	2012	11,508	70,973,982	2,623,805,052	125,969,655	238,543	2,497,835,397	1,283,134
	2013	10,497	66,649,745	2,942,644,967	133,777,854	223,046	2,808,867,113	1,370,664
FALL								
	2009	8,320	43,733,843	1,847,578,063	104,211,796	175,560	1,743,366,267	861,611
	2010	7,126	34,734,176	2,258,933,204	60,049,489	121,168	2,198,883,715	1,112,984
	2011	8,889	45,341,553	3,319,101,940	89,583,253	113,878	3,229,518,687	1,583,570
	2012	9,169	46,568,882	2,955,710,218	114,012,554	155,210	2,841,697,664	1,589,809
	2013	8,155	45,785,562	3,242,390,874	99,167,695	106,469	3,143,223,179	1,747,505
WINTER								
	2009	8,681	41,637,091	1,083,875,088	55,648,229	195,527	1,028,226,859	277,781
	2010	6,122	40,012,887	1,143,865,677	40,664,097	179,616	1,103,201,580	311,209
	2011	6,264	43,227,002	2,006,151,841	81,467,272	247,642	1,924,684,569	541,249
	2012	5,291	35,471,512	1,730,647,960	81,796,748	180,133	1,648,851,212	477,435
	2013	4,377	39,139,292	1,967,299,569	45,405,699	180,171	1,921,893,870	528,227

4.1.4.5 Overall Data Trends by Sector

The sector-specific data for all fishing trips by sector vessels show tremendous variability for trips, catch, and geardays between sectors.

Table 14. Overall Trips, Catch, and Geardays for Sector Vessels by Sector

Fixed Gear Sector						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	3,259	10,388,942	342,936,158	91,732,426	251,203,732
	2010	3,531	8,376,263	375,913,380	80,266,948	295,646,432
	2011	3,930	9,773,441	424,902,240	103,524,023	321,378,217
	2012	3,570	9,116,285	356,863,071	95,529,614	261,333,457
	2013	3,357	7,911,757	347,419,432	84,131,091	263,288,340
NCCS						

	Fishing Year	Trips	Catch (lbs)	Geardays	Non-Lobster Geardays	Lobster Geardays
	2009	1,007	760,377	531,015,786	4,262	531,011,524
	2010	1,029	694,131	559,304,448	551,468	558,752,980
	2011	1,606	1,110,204	1,208,603,449	7,200,702	1,201,402,747
	2012	1,759	1,572,257	1,256,389,030	26,847,849	1,229,541,182
	2013	1,898	1,416,671	1,403,771,292	18,663,715	1,385,107,577
NEFS 2						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	4,402	12,076,459	322,641,337	721,621	321,919,717
	2010	2,792	10,980,809	333,668,532	244,619	333,423,913
	2011	3,728	13,114,796	664,806,510	255,845	664,550,665
	2012	3,426	12,157,861	501,418,957	279,240	501,139,717
	2013	2,456	8,402,021	515,136,935	228,317	514,908,618
NEFS 3						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	6,260	8,496,459	1,528,971,194	102,510,209	1,426,460,985
	2010	3,714	5,948,267	1,978,840,629	88,946,250	1,889,894,379
	2011	4,917	6,546,091	2,433,151,450	133,456,499	2,299,694,951
	2012	4,511	6,213,380	2,165,386,951	141,945,827	2,023,441,124
	2013	3,304	3,712,321	2,208,871,478	103,734,579	2,105,136,900
NEFS 5						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	3,139	30,057,638	141,952,700	5,123,272	136,829,428
	2010	3,197	29,440,638	58,939,027	3,324,960	55,614,067
	2011	2,882	27,852,334	162,134	162,134	-
	2012	2,515	26,023,245	161,612	161,612	-
	2013	3,038	23,852,078	88,708,804	6,079,863	82,628,942
NEFS 6						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	272	4,359,201	774,711,690	173,059	774,538,631
	2010	276	4,046,407	762,210,485	138,875	762,071,610
	2011	328	4,260,067	2,145,993,216	140,492	2,145,852,725
	2012	294	3,845,825	759,760,615	153,170	759,607,446

	2013	507	3,359,777	936,486,618	128,899	936,357,719
NEFS 7						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	963	13,793,466	83,146,195	13,423,885	69,722,310
	2010	827	7,341,063	102,764,709	12,813,878	89,950,831
	2011	559	5,421,878	17,693,555	17,216,372	477,183
	2012	528	5,145,371	62,159,862	16,440,887	45,718,975
	2013	561	6,560,842	82,341,650	23,982,684	58,358,966
NEFS 8						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	390	7,886,358	208,479	208,479	-
	2010	323	7,176,508	137,472	137,472	-
	2011	343	7,916,462	152,645	152,645	-
	2012	276	6,070,357	143,859	143,859	-
	2013	245	6,400,194	112,290	112,290	-
NEFS 9						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	696	8,784,960	482,988	482,988	-
	2010	594	9,375,466	473,057	473,057	-
	2011	691	13,542,737	612,509	612,509	-
	2012	757	12,558,507	580,491,878	604,414	579,887,464
	2013	790	12,320,748	784,207,600	506,456	783,701,143
NEFS 10						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	2,259	3,688,554	88,041,067	22,832,786	65,208,281
	2010	1,820	2,945,014	337,598,034	27,536,787	310,061,247
	2011	2,439	3,983,207	520,091,106	33,567,875	486,523,232
	2012	2,926	4,028,774	819,356,239	36,672,430	782,683,809
	2013	1,624	1,826,427	371,746,051	33,359,540	338,386,511
NEFS 11						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	3,733	10,341,763	853,540,944	74,226,391	779,314,553
	2010	2,775	6,454,037	923,328,005	49,858,624	873,469,381

	2011	2,819	6,109,485	1,165,309,049	44,362,508	1,120,946,541
	2012	3,027	6,042,107	1,483,484,537	47,145,533	1,436,339,004
	2013	2,453	3,964,359	1,582,760,617	39,797,132	1,542,963,485
NEFS 12						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	610	1,117,405	5,309,779	165,048	5,144,730
	2010	381	856,886	105,406	5,477	99,929
	2011	502	1,966,640	7,271,965	7,171,902	100,063
	2012	570	1,493,581	11,109,774	10,121,337	988,437
	2013	410	942,825	37,033,872	13,075,148	23,958,724
NEFS 13						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	1,156	18,898,878	307,768	307,768	-
	2010	1,255	21,307,399	302,827	302,759	68
	2011	1,522	28,766,755	331,854	331,854	-
	2012	2,347	31,005,554	129,615,122	3,968,154	125,646,968
	2013	2,746	35,666,515	116,776,252	1,928,365	114,847,887
Maine Coast Community						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	2,331	6,815,907	527,248,977	25,506,023	501,742,954
	2010	2,016	4,419,611	682,625,544	8,193,691	674,431,852
	2011	1,953	4,025,282	764,521,232	17,687,560	746,833,672
	2012	1,909	4,697,158	952,779,110	16,203,064	936,576,046
	2013	2,008	16,941,033	1,469,126,586	21,010,457	1,448,116,129
Sustainable Harvest 1						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	2,437	32,010,788	46,328,055	13,378,401	32,949,654
	2010	2,277	31,926,702	48,179,999	4,991,455	43,188,544
	2011	1,950	38,663,150	111,879,894	4,149,004	107,730,890
	2012	1,892	37,006,705	9,359,184	6,806,303	2,552,881
	2013	1,884	40,696,614	25,323,353	25,253,306	70,047
Sustainable Harvest 3						

	Fishing Year	Trips	Catch (lbs)	Geardays	Non-Lobster Geardays	Lobster Geardays
	2009	-	-	-	-	-
	2010	-	-	-	-	-
	2011	577	17,750,209	28,165	28,165	-
	2012	612	17,643,130	29,339	29,339	-
	2013	576	9,410,557	77,555	77,555	-
Tri-State Sector						
	Fishing Year	**Trips**	**Catch (lbs)**	**Geardays**	**Non-Lobster Geardays**	**Lobster Geardays**
	2009	754	5,342,724	152,821,468	1,059,023	151,762,445
	2010	698	6,369,822	163,198,462	2,626,386	160,572,076
	2011	634	4,282,771	180,140,422	1,913,416	178,227,006
	2012	627	5,033,254	7,801,631	7,801,631	-
	2013	-	-	-	-	-

4.1.5 Effort Data for Sector Vessels on Groundfish Trips

The next series of data shows shifts in effort over a four-year period by looking at groundfish trips taken by sector participants along with DOF (i.e. trips where the vessel declared out of the groundfish fishery) trips taken by sector participants. This gives an idea of the magnitude of trips, and catch from vessels that are fishing inside and outside the groundfish fishery in FY 2009 through FY 2013. As in the previous data set, the FY 2009 data is from vessels that were members of a sector in FY 2010.

Table 15. Trips, Catch, and Geardays for Sector Vessels on Groundfish Trips by Gear

Gillnet

Fishing Year	Trips	Catch (lbs)	Geardays
2009	10,742	30,267,285	311,206,108
2010	5,967	18,856,042	230,376,382
2011	7,456	22,521,894	309,935,581
2012	6,583	21,681,534	327,617,596
2013	4,643	14,576,977	295,701,608

Longline

Fishing Year	Trips	Catch (lbs)	Geardays
2009	559	2,203,370	8,014,186
2010	494	1,531,818	8,102,401
2011	733	1,687,125	5,265,342
2012	764	1,485,525	780,128
2013	121	104,269	92,519

Fish Traps and Weirs

Fishing Year	Trips	Catch (lbs)	Geardays
2009	-	-	-
2010	-	-	-
2011	-	-	-
2012	-	-	-
2013	-	-	-

Pots

Fishing Year	Trips	Catch (lbs)	Geardays
2009	29	23,004	19,293,381
2010	5	1,499	670,596
2011	-	-	-
2012	19	13,045	16,042,245
2013	6	2,480	3,394,321

Trawl, Seine or Dredge

Fishing Year	Trips	Catch (lbs)	Geardays
2009	8,500	60,234,103	1,625,337
2010	4,402	55,987,303	1,389,086
2011	5,771	65,742,909	1,837,664
2012	6,162	56,047,520	1,766,415
2013	4,618	51,206,266	1,545,279

Undefined

Fishing Year	Trips	Catch (lbs)	Geardays
2009	355	227,241	473
2010	140	198,168	170
2011	171	184,694	419
2012	42	82,484	1,835
2013	29	14,569	115

Data from groundfish trips, and trips using a groundfish or monkfish DAS, broken out by gear type, show a major reduction in trips, and catch (aside from trawl), while geardays have remained constant for gillnet and trawl vessels.

Table 16. Trips and Catch for Sector Vessels on Groundfish Trips by RMA

GB	Fishing Year	Trips	Catch (lbs)
	2009	3,157	44,992,904
	2010	3,089	39,425,957
	2011	3,312	40,110,818
	2012	3,138	28,721,303
	2013	2,614	28,159,323

GOM	Fishing Year	Trips	Catch (lbs)
	2009	15,769	40,590,541
	2010	7,115	27,465,428
	2011	9,669	37,168,314
	2012	8,992	38,439,605
	2013	5,474	26,207,681

MA	Fishing Year	Trips	Catch (lbs)
	2009	124	444,367
	2010	117	340,636
	2011	130	298,861
	2012	100	220,525
	2013	93	217,244

ORM	Fishing Year	Trips	Catch (lbs)
	2009	18	281,323
	2010	32	364,304
	2011	55	709,823
	2012	87	941,882
	2013	71	737,381

SNE	Fishing Year	Trips	Catch (lbs)
	2009	1,189	6,605,956
	2010	1,184	8,978,505
	2011	1,657	11,848,806
	2012	1,840	10,986,793
	2013	1,823	10,578,132

In terms of RMA, data show that the number of groundfish trips has decreased substantially in the GOM RMA, while catch has increased most in SNE. The recent decreases in the GOM cod and haddock ACLs may help to explain the decrease in the number of trips in the GOM, while allocating SNE/MA winter flounder to sector vessels may help to explain the increase in SNE trips.

Table 17. Trips and Catch for Sector Vessels Fishing on DOF Trips by RMA

GB	Fishing Year	Trips	Catch (lbs)
	2009	592	7,315,961
	2010	643	9,679,556
	2011	485	8,461,694
	2012	456	8,183,467
	2013	663	9,696,901

GOM	Fishing Year	Trips	Catch (lbs)
	2009	3,246	6,886,019
	2010	4,711	8,270,443
	2011	3,635	4,434,187
	2012	3,561	3,035,538
	2013	3,322	2,329,715

MA	Fishing Year	Trips	Catch (lbs)
	2009	228	7,511,696
	2010	233	4,739,791
	2011	236	15,050,061
	2012	222	19,719,128
	2013	176	7,496,811

SNE	Fishing Year	Trips	Catch (lbs)
	2009	3,318	31,694,319
	2010	3,570	34,361,003
	2011	3,718	36,465,446
	2012	4,108	35,535,184
	2013	3,779	35,036,606

Sector vessels also may elect to fish in other fisheries, depending on the permits that they hold. Overall, data show an increase in trips and catch. This indicates that many vessels in sectors increased their catch outside of the groundfish fishery in FY 2013 over FY 2009. Data provided by the sectors in their annual reports indicates that sector vessels shifted their effort into the lobster, dogfish, monkfish and skate fisheries. The decline in geardays in the GOM in 2012-2013 is most likely attributed to the reduction in quota for the Northern shrimp fishery.

Table 18. Overall Trips and Catch for Sector Vessels by Season

		Groundfish Trips		DOF Trips	
Spring	**Fishing Year**	**Trips**	**Catch (lbs)**	**Trips**	**Catch (lbs)**
	2009	3,176	21,636,880	1,287	9,058,108
	2010	2,317	21,216,904	1,147	10,436,385
	2011	2,747	23,035,041	1,065	9,989,631
	2012	2,528	20,476,550	1,425	12,071,839
	2013	1,955	17,884,923	1,168	10,118,919
Summer	**Fishing Year**	**Trips**	**Catch (lbs)**	**Trips**	**Catch (lbs)**
	2009	6,938	29,496,417	1,667	15,124,792
	2010	3,834	24,143,108	2,494	15,128,123
	2011	4,741	26,907,099	2,458	27,232,868
	2012	4,729	25,406,847	2,844	27,339,156
	2013	3,144	18,942,144	3,008	15,710,591
Fall	**Fishing Year**	**Trips**	**Catch (lbs)**	**Trips**	**Catch (lbs)**
	2009	4,598	22,407,799	2,047	14,485,925
	2010	2,650	15,471,454	2,488	13,033,585
	2011	3,484	20,313,300	2,545	15,207,102
	2012	3,696	18,045,920	2,562	17,094,035
	2013	2,479	15,853,219	2,594	17,121,256
Winter	**Fishing Year**	**Trips**	**Catch (lbs)**	**Trips**	**Catch (lbs)**
	2009	5,457	19,413,907	2,363	14,754,186
	2010	2,200	15,743,364	3,008	18,466,866
	2011	3,156	19,881,182	1,973	11,983,187
	2012	2,608	15,380,791	1,486	10,004,745
	2013	1,836	13,224,275	1,143	11,590,858

The seasonal data show that for groundfish trips, the number of trips is down substantially. However, DOF trips have shown an increase in catch and trips during the summer & fall.

Table 19. Overall Trips and Catch for Sector Vessels by Vessel Length

< 50 feet	Fishing Year	Groundfish Trips: Trips	Groundfish Trips: Catch (lbs)	DOF Trips: Trips	DOF Trips: Catch (lbs)
	2009	15,326	36,773,727	3,457	5,051,471
	2010	7,505	21,993,490	4,943	7,040,853
	2011	10,040	26,890,733	4,316	4,601,587
	2012	9,385	25,754,262	4,780	5,414,699
	2013	5,892	15,953,293	4,678	4,385,830

50 to 74 feet	Fishing Year	Trips	Catch (lbs)	Trips	Catch (lbs)
	2009	3,740	30,098,232	3,017	24,333,599
	2010	2,423	26,098,089	3,396	26,727,599
	2011	3,008	30,543,294	3,033	26,488,910
	2012	3,096	25,490,707	2,859	28,880,477
	2013	2,510	23,869,839	2,641	28,558,871

>=75 feet	Fishing Year	Trips	Catch (lbs)	Trips	Catch (lbs)
	2009	1,103	26,083,044	890	24,037,941
	2010	1,073	28,483,251	798	23,296,507
	2011	1,080	32,702,595	692	33,322,291
	2012	1,080	28,065,139	678	32,214,599
	2013	1,012	26,081,429	594	21,596,923

In looking at the length classes of groundfish vessels, the data show that catch and trips for groundfish trips taken by the smaller vessels fell more substantially than larger vessels. Conversely, data show that the number of trips and the amount of catch fluctuated, but did not decline substantially, for the largest vessel size analyzed.

4.1.6 Bycatch Data

Data in Table 20 show all catch by sector vessels on groundfish trips when vessels are not fishing on a Monkfish DAS. Data show an overall decrease in catch for groundfish trips taken without a monkfish DAS. Table 21 shows non-directed species catch by sector vessels while on groundfish trips without a monkfish DAS. Table 22 shows monkfish/skate/dogfish catch by sector vessels while on groundfish trips without a monkfish DAS.

Table 20. Sector Vessels on Groundfish Trips without a Monkfish DAS by Gear Class

Gillnet	Fishing Year	Catch (lbs)
	2009	26,695,687
	2010	15,512,914
	2011	18,593,493
	2012	18,228,964
	2013	11,888,193

Longline	Fishing Year	Catch (lbs)
	2009	2,203,370
	2010	1,531,818
	2011	1,687,125
	2012	1,485,525
	2013	104,269
Fish Traps and Weirs	**Fishing Year**	**Catch (lbs)**
	2009	-
	2010	-
	2011	-
	2012	-
	2013	-
Pots	**Fishing Year**	**Catch (lbs)**
	2009	22,625
	2010	-
	2011	-
	2012	13,045
	2013	1,220
Trawl, Seine or Dredge	**Fishing Year**	**Catch (lbs)**
	2009	56,241,299
	2010	51,331,270
	2011	60,345,912
	2012	51,850,802
	2013	49,826,007
Undefined	**Fishing Year**	**Catch (lbs)**
	2009	222,041
	2010	198,168
	2011	184,694
	2012	18,693
	2013	14,569

Table 21. Groundfish Trips without Monkfish DAS

Non-Directed Species Catch (lbs)					
GEAR CATEGORY	**2009**	**2010**	**2011**	**2012**	**2013**
Gillnet or Trap	12,970,984	8,249,204	10,173,158	12,347,715	7,310,893
Longline	919,114	472,929	658,222	1,353,375	29,351
Pots	9,500	-	-	13,009	1,185
Trawl, Seine, or Dredge	12,364,959	9,188,517	13,302,097	13,981,349	14,829,373
Undefined	31,992	133,916	101,400	6,600	1,774
Total	26,296,549	18,044,566	24,234,877	27,702,048	22,172,576

Table 22. Groundfish Trips without Monkfish DAS

Monkfish+Skate+Dogfish Catch (live lbs)					
GEAR CATEGORY	**2009**	**2010**	**2011**	**2012**	**2013**
Gillnet or Trap	15,627,113	11,301,148	13,717,087	15,446,906	10,037,964
Longline	919,672	464,144	639,842	1,355,176	25,414
Pots	2,064	-	-	-	
Trawl, Seine, or Dredge	15,365,127	10,603,433	15,964,152	15,956,833	16,703,194
Undefined	31,091	98,425	97,667	6,145	686
Total	31,945,067	22,467,150	30,418,747	32,765,061	26,767,258

The following data show catch when sector vessels are fishing on groundfish trips with a Monkfish DAS. Catch while using a monkfish DAS has remained relatively consistent between 2009 and 2013.

Table 23. Groundfish Trips with Monkfish DAS

All Catch (lbs)					
GEAR CATEGORY	**2009**	**2010**	**2011**	**2012**	**2013**
Gillnet or Trap	3,571,598	3,343,128	3,928,401	3,452,570	2,688,784
Trawl, Seine, or Dredge	3,992,804	4,656,033	5,396,997	4,260,509	1,380,259
Total	7,564,402	7,999,161	9,325,398	7,713,079	4,069,043

Table 24. Groundfish Trips with Monkfish DAS

Non-Directed Species Catch (lbs)					
GEAR CATEGORY	**2009**	**2010**	**2011**	**2012**	**2013**
Gillnet or Trap	3,361,987	3,218,000	3,819,621	3,390,138	2,538,391
Trawl, Seine, or Dredge	1,642,991	1,871,639	2,204,985	1,801,751	733,140
Total	5,004,978	5,089,639	6,024,606	6,780,276	3,271,531

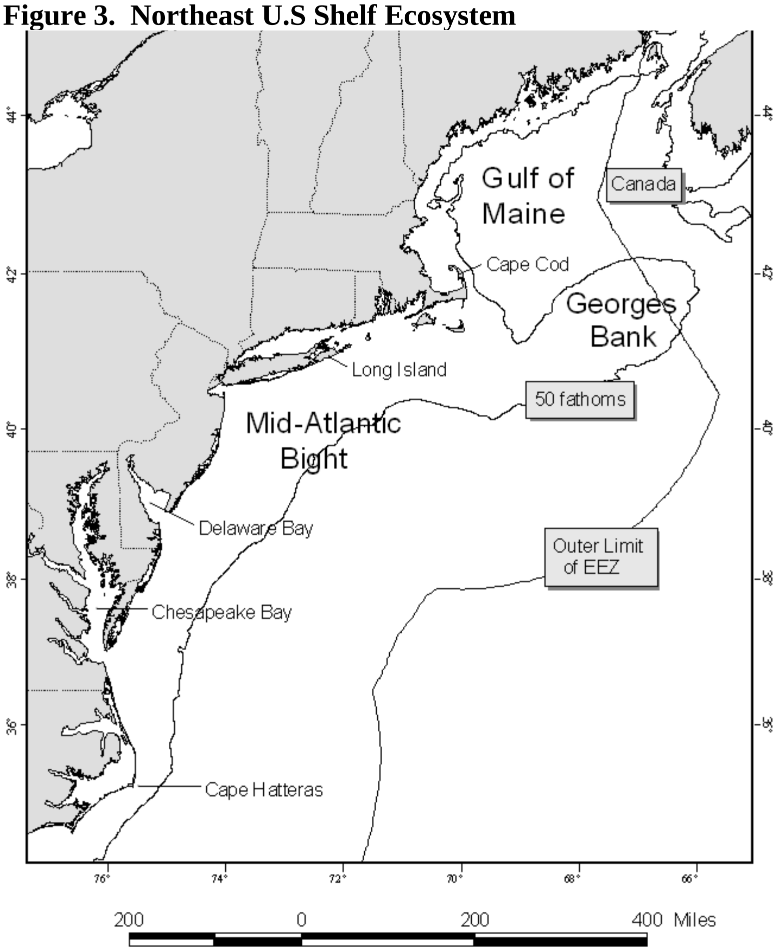
Table 25. Groundfish Trips with Monkfish DAS

Monkfish+Skate+Dogfish Catch (live lbs)					
GEAR CATEGORY	**2009**	**2010**	**2011**	**2012**	**2013**
Gillnet, or Trap	4,524,371	4,138,301	5,129,489	4,283,638	3,594,662
Trawl, Seine, or Dredge	2,596,421	2,508,126	3,255,577	2,697,836	1,019,314
Total	7,120,792	6,646,427	8,385,067	6,981,473	4,613,976

4.2 PHYSICAL ENVIRONMENT/HABITAT/EFH

The Northeast U.S. Shelf Ecosystem (Figure 3) 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 3. Northeast U.S Shelf Ecosystem



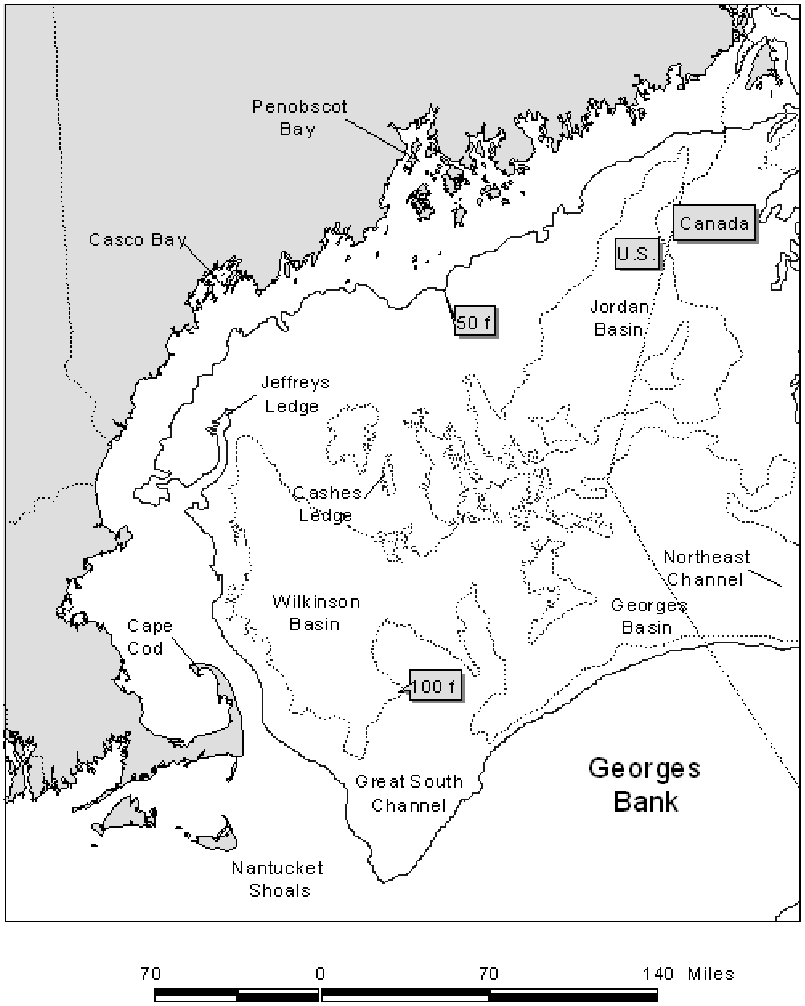
4.2.1 Affected Physical Environment

4.2.1.1 Gulf of Maine

The Gulf of Maine is bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Figure 4). 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 4. 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 (Stevenson et al. 2004). 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,[3] 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:[4] 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.

[3] 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.

[4] 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 and Tyler 1985) reported common[5] 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.

4.2.1.2 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 3). 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 and 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:

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

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

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.

4.2.1.3 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 3). 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 and 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 polycheates 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.[6]

- 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.

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

4.2.2 Habitat

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 26 briefly summarizes the habitat requirements for the demersal life stages of 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, species profiles available from NMFS (Clark 1998), and existing EFH descriptions.

Table 26. Summary of Geographic Distribution, Food Sources, Essential Fish Habitat Features, and Commercial Gear Used to Catch Each Species in the Northeast Multispecies Fishery Management Unit

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
Atlantic cod	Gulf of Maine, Georges Bank and southward	Omnivorous (invertebrates and fish)	(J): 82-245 ft (25-75 m)	(J): Cobble or gravel bottom substrates	Otter trawl, bottom longlines, gillnets
			(A): 33-492 ft (10-150 m)	(A): Rocks, pebbles, or gravel bottom substrate	
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)	(J): Pebble and gravel bottom substrates	Otter trawl, bottom longlines, gillnets
			(A): 131-492 ft (40-150 m)	(A): Broken ground, pebbles, smooth hard sand, smooth areas between rocky patches	
Acadian redfish	Gulf of Maine, deep portions of Georges Bank and Great South Channel	Crustaceans	(J): 82-1,312 ft (25-400 m)	(J): Bottom habitats with a substrate of silt, mud, or hard bottom	Otter trawl
			(A): 164-1,148 ft (50-350 m)	(A): Same as for (J)	
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)	(J): Bottom habitats with aquatic vegetation or substrate of sand, mud, or rocks	Otter trawl, gillnets
			(A): 49-1,198 ft (5-365 m)	(A): Hard bottom habitats including artificial reefs	
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)	(J): Bottom habitat with a substrate of sand, gravel, or clay	Otter trawl, bottom longlines
			(A): 328-2,297 ft (100-700 m)	(A): Same as for (J)	
			(J): 262 ft (<80 m)	(J): Bottom habitat, often smooth areas near rocks or algae	

Table 26 (continued)

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
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 as well as on mollusks and 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)	(L): Hard bottom nesting areas	
			(J): 262 ft (<80 m)	(J): Bottom habitat, often smooth areas near rocks or algae	
			(A): 361 ft (<110 m)	(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)	(J): Bottom habitat with seagrass beds or substrate of mud or fine-grained sand	Otter trawl, gillnets
			(A): 16-1,066 ft (5-325 m)	(A): Bottom habitats with substrate of mud or fine grained sand	
Yellowtail flounder	Gulf of Maine, southern New England, Georges Bank	Amphipods and polychaetes	(J): 66-164 ft (20-50 m)	(J): Bottom habitats with substrate of sand or sand and mud	Otter trawl
			(A): 66-164 ft (20-50 m)	(A): Same as for (J)	
American plaice	Gulf of Maine, Georges Bank	Polychaetes, crustaceans, mollusks, echinoderms	(J): 148-492 ft (45-150 m)	(J): Bottom habitats with fine grained sediments or a substrate of sand or gravel	Otter trawl
			(A): 148-574 ft (45–175 m)	(A): Same as for (J)	

Table 26 (continued)

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
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)	(J): Bottom habitats with fine grained substrate	Otter trawl
			(A): 82-984 ft) (25-300 m)	(A): Same as for (J)	
Winter flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Polychaetes, crustaceans	(E): 16 ft (<5 m)	(E): Bottom habitats with a substrate of sand, muddy sand, mud, and gravel	Otter trawl, gillnets
			(J): 0.3-32 ft (0.1-10 m) (3-164 ft age 1+) (1-50 m)	(J): Bottom habitats with a substrate of mud or fine grained sand	
			(A): 3.2-328 ft (1-100 m)	(A): Bottom habitats including estuaries with substrates of mud, sand, gravel	
Atlantic wolffish	Gulf of Maine & Georges Bank	Mollusks, brittle stars, crabs, and sea urchins	(E) 131.2-787.4 ft (40-240 m)	(E) Rocky substrates in nests	Otter trawl, bottom longlines, and gillnets
			(J): 131.2-787.4 ft (40-240 m)	(J): Rocky bottom, coarse and fine sediments	
			(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)	

4.2.3 Essential Fish Habitat (EFH)

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 surfclam 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 26 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 https://www.nero.noaa.gov/habitat/index.html. 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.

4.2.4 Gear Types and Interaction with Habitat

Sectors would 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 2014 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.

4.2.4.1 Gear Types

Table 27 summarizes the typical gear types used by the multispecies fishery.

Table 27. Descriptions of Gear Types Used by the Multispecies Fishery

	Gear Type			
	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	Footrope (sweep) of net, bridles, and ground cables to doors contact bottom	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/ Duration of Use	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

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 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 (NEFSC 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, and to get fish like flounders. Flounders that 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 (NEFSC 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 2008).

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 (NEFSC 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.

Fish Traps/Pots

Fish traps, pots, and lobster pots are similar. To help differentiate, the following descriptions are given. A non-lobster trap could be a trap that is configured with small mesh or small entrances that effectively exclude lobsters, or a floating trap that is fished off the bottom. If a fish pot or trap is configured in such a way that it is not capable of catching lobster, then NMFS would not consider it to be a lobster trap, and the vessel would not be subject to the lobster trap gear specifications. NMFS has determined that the floating Norwegian fish pots are not lobster traps.

The Norwegian design pots are collapsible two-chamber rectangular pots made of netting, with a single bridle with anchor along the short end of the pot, allowing it to float and to turn with the current, adapted from Furevik et al. (2008). They have one entrance at the opposite end as the bridle, and are made of 50 mm black poly mesh for the trap body and 50 mm white poly for the entrances (into the pot and between chambers). Three frames per pot were constructed of 2 cm diam. PVC electrical conduit, with 13 cm radius corners, glued with cement. The frame sizes were approx. 1.5 m x 1 m (4.79 ft x 3.28 ft), hung 0.7 m (2.3 ft) apart forming two chambers with a widemouth entrance in between. The bridles were anchored with >5 kg links of chain. The PVC pipes were then perforated and 11 deep-water gillnet floats were added along the upper frame to achieve proper orientation. During the tank investigation, the top of the Norwegian pot was measured to be 3 m off bottom; the bottom of the pot was 1.5 m off-bottom.

Some sector vessels have shifted effort into the lobster fishery in recent years. These are vessels that hold a lobster permit, and can fish pursuant to that permit on a trip that is not considered a sector trip. These vessels use lobster pots. The description of this gear is included in this document as effort shift is an impact of sector management. 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.

Hook and Line Gear

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. Hand lines 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.

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 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.

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 (NEFSC 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.

4.2.4.2 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.

Amendment 13 (NEFMC 2003) describes the general effects of bottom trawls on benthic marine habitats. This analysis primarily uses an advisory report prepared for the International Council for the Exploration of the Seas. This report identified a number of possible effects of bottom otter trawls on benthic habitats (International Council for the Exploration of the Seas 2000). The International Council for the Exploration of the Seas report 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;
- <u>Changes are not likely to be permanent</u> 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
- <u>Changes are not likely to be permanent</u> 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 (National Research Council 2002) prepared a more recent evaluation of the habitat effects of trawling and dredging. Trawl gear 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 Mid-Atlantic Fishery Management Council (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 summarizes 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 and Chuenpagdee 2003). This group evaluated the habitat effects of 10 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).

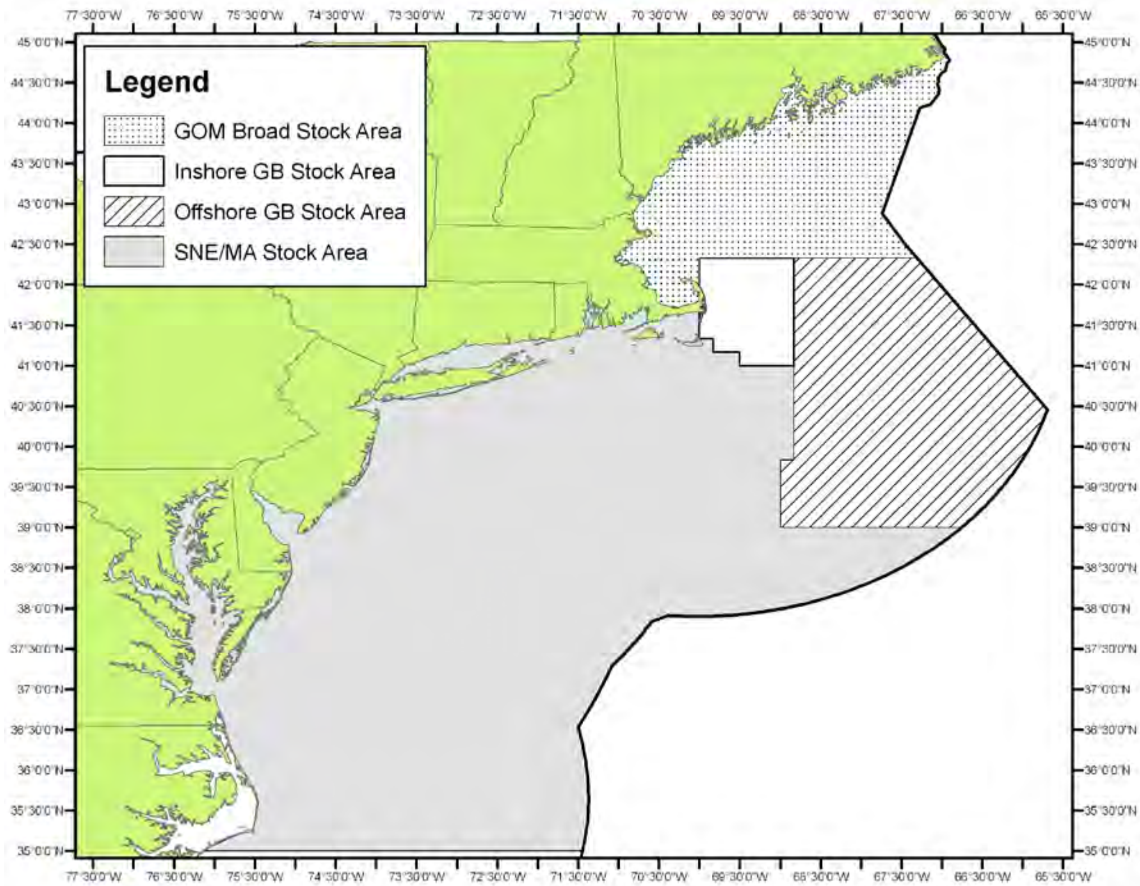
4.3 ALLOCATED TARGET SPECIES

This section describes the life history and stock population status for each allocated fish stock the sectors harvest under the Northeast Multispecies FMP. Figure 5 identifies the four broad stock areas used in the fishery. Please refer to the species habitat associations described in Section 4.2 for information on the interactions between gear and species. Section 4.2 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 4.2.4.1) 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/.

4.3.1 Species and Stock Status Descriptions

The 15 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, SNE/MA winter flounder, Cape Cod/GOM yellowtail flounder, GB yellowtail flounder, SNE/MA yellowtail flounder, redfish, pollock and white hake.

Figure 5. 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 4.4 and 5.1. Northeast Multispecies FMP does not allocate these species. They are managed under their own FMPs.

The Northeast Multispecies FMP also manages Atlantic halibut, ocean pout, windowpane flounder, and wolffish. However, sectors do not receive an allocation of these species. Therefore, this EA does not further discuss these species. Sector and common pool vessels may not land wolffish, ocean pout, or windowpane flounder, but may retain one halibut per trip.

4.3.1.1 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 peaks 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 occurring 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 18 percent of the biomass rebuilding target. Currently, the GOM cod stock is overfished and overfishing is occurring.

4.3.1.2 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.

4.3.1.3 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.

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 directs mostly at 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 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.

4.3.1.4 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.

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.

4.3.1.5 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.

4.3.1.6 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 between 32 and 50 °F (0 to 10^{o}C).

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

4.3.1.7 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 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.

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

4.3.1.8 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.

4.3.1.9 Southern New England-Mid-Atlantic 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 (15°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 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 2011).

4.3.1.10 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.

4.3.1.11 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.

4.3.1.12 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.

4.3.1.13 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.

4.3.1.14 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^{o}C) and peaks when temperatures are approximately 40 to 43 °F (4.5 to 6^{o}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.

4.3.1.15 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 56th SAW Assessment for white hake in 2013 concluded the stock was not overfished and overfishing was not occurring.

4.3.2 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 4.2.2-1(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 28 vary slightly between the two studies. For further information on fish habitat relationships, see Table 26.

Table 28. 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		

4.3.3 Stock Status Trends

The most recent stock assessments for groundfish stocks can be found via the NEFSC website at http://www.nefsc.noaa.gov/publications/. The information in this section is adapted from the most recent stock assessments for the groundfish stocks. Table 29 summarizes the status of the northeast groundfish stocks.

The F_{MSY} is the fishing mortality rate (F) that produces the maximum sustainable yield (MSY), defined as the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions (National Standards Guidelines 50 CFR 600.310)

Table 29. Status of the Northeast Groundfish Stocks for fishing year 2014

Stock Status	Stock (assessment source)
<u>Overfished and Overfishing</u> Biomass < ½ B_{MSY} and F > F_{MSY}	GB Cod (GARM III) GOM Cod (SARC 54) Cape Cod/GOM Yellowtail Flounder (assessment update) Witch Flounder (assessment update) Northern Windowpane (operational assessment) GB Yellowtail Flounder (2012 TRAC)
<u>Overfished but not Overfishing</u> Biomass < ½ B_{MSY} and F $\leq$ F_{MSY}	Ocean Pout (assessment update) Atlantic Halibut (assessment update) GOM Winter Flounder (SARC 52)[b] Atlantic wolffish (assessment update) SNE/MA Winter Flounder
<u>Not Overfished but Overfishing</u> Biomass $\geq$ ½ B_{MSY} and F > F_{MSY}	GOM Haddock (assessment update)
<u>Not Overfished and not Overfishing</u> Biomass $\geq$ ½ B_{MSY} and F $\leq$ 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) White Hake (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.

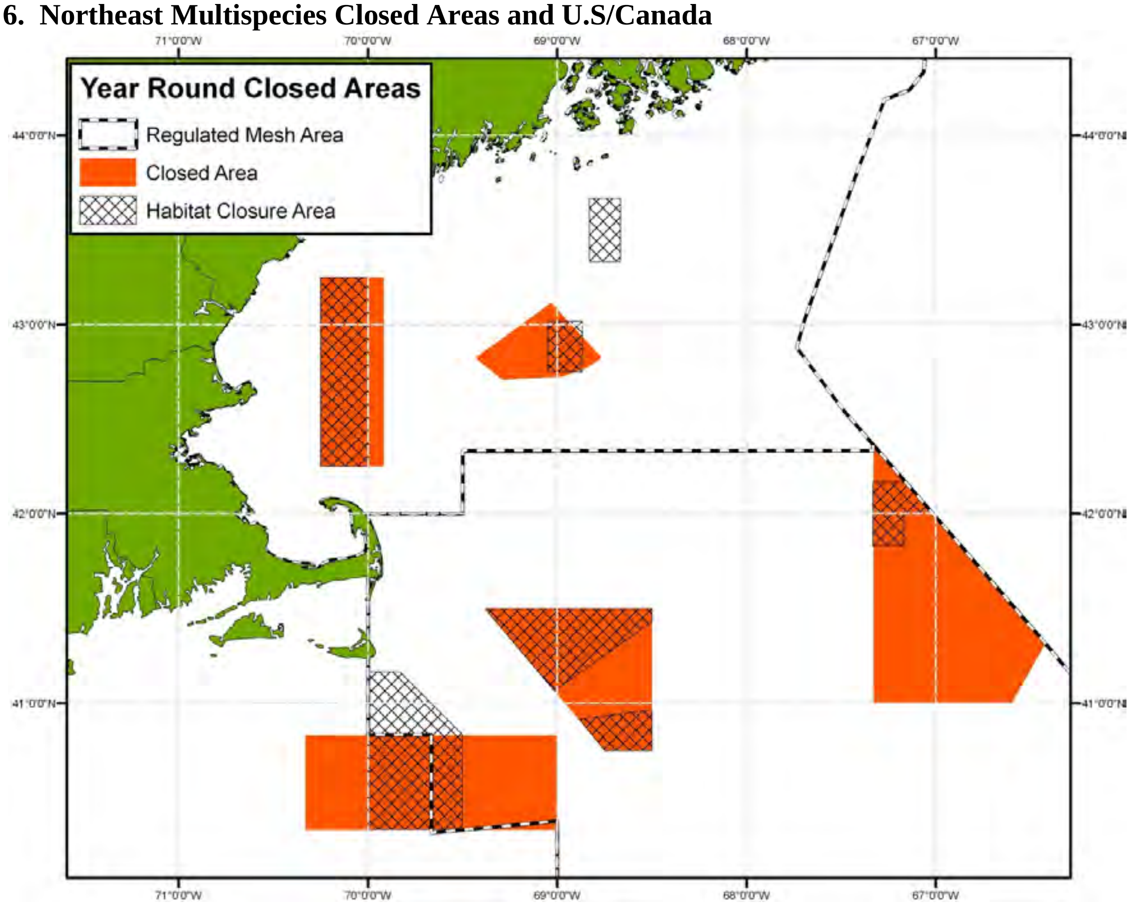
Assessment references (available at http://www.nefsc.noaa.gov/saw/)
Northeast Fisheries Science Center. 2008. Assessment of 19 Northeast Groundfish Stocks through 2007: Report of the 3rd Groundfish Assessment Review Meeting (GARM III), Northeast Fisheries Science Center, Woods Hole, Massachusetts, August 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

4.3.4 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 6 shows the Closed Areas for FY 2014.

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 26). In many cases, these closed areas overlap portions of the groundfish mortality closures (Figure 6). 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 and groundfish areas. Therefore, these areas may be changed or eliminated in the future. 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 6. Northeast Multispecies Closed Areas and U.S/Canada



4.3.5 Interaction between Gear and Allocated Target Species

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.

4.4 NON-ALLOCATED TARGET SPECIES AND BYCATCH

As defined in Section 1.1.1, 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 2014 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.

Atlantic halibut, Gulf of Maine-Georges Bank windowpane flounder, Southern New England-Mid-Atlantic Bight windowpane flounder, ocean pout, Atlantic wolffish, and Southern New England/Mid-Atlantic (SNE/MA) winter flounder are part of the Multispecies FMP, but are not allocated to sectors. Therefore, impacts to these species are assessed under this VEC as bycatch.

4.4.1 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.

4.4.2 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 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. One skate species is considered overfished (thorny) and overfishing is occurring on thorny and winter skates.

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.

4.4.3 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.

4.4.4 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).

4.4.5 Gulf of Maine-Georges Bank 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.

4.4.6 Southern New England-Mid-Atlantic Bight 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 (Collettee 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.

4.4.7 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 on 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).

4.4.8 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.

4.4.9 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).

4.4.10 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 4.1.

The Final Supplemental Environmental Impact Statement to Amendment 2 (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 2014.

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 30 shows that otter trawl gear caught the majority of non-allocated target species and bycatch between FY 1996 to FY 2006.

Table 30. Landings (mt) for Non-allocated Target Species and Bycatch by Gear Type[a]

	Gear Type									
	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	2646 [d]	151,505	491,280
Dogfish	24,368	61,914	72,712	39,852	--	--	946	--	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 1996-2005

[b.] Total landings or discards may differ slightly from the sum of the individual fishery entries due to differences in rounding.

[c] Shrimp Trawl

[d] Line and shrimp trawl

Source: Northeast Data Poor Stocks Working Group 2007a; Northeast Data Poor Stocks Working Group 2007b ; Sosebee et al. 2008; NEFSC 2006a.

4.5 PROTECTED RESOURCES

4.5.1 Species Present in the Area

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

Table 31 Species Protected Under the Endangered Species Act and/or Marine Mammal Protection Act that May Occur in the Operation Area for the Northeast Multispecies Fishery

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

Harp seal (*Phoca groenlandicus*)	Protected	Yes
Hooded seal (*Cystophora cristata*)	Protected	Yes
Critical Habitat		
North Atlantic Right Whale	ESA Listed	No
Atlantic Salmon	ESA Listed	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA Listed	No

Notes:

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

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

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

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

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

In regards to cusk, NMFS initiated a status review due to concerns over the status of and threats to cusk, particularly bycatch. NMFS is involved in various proactive conservation initiatives to obtain more information on this data poor species to assess its status and further conservation efforts. These initiatives involve cooperative efforts with industry, scientists, and other partners to learn more about cusk. NMFS is especially interested in the investigation and identification of methods to reduce bycatch or discard mortality of cusk, and, in particular, studies of how to alleviate barotrauma effects in released cusk are of high interest. In the Northeastern U.S., cusk are predominantly caught in the Gulf of Maine in commercial bottom trawl, bottom longline, gillnet, lobster trap, and handline/rod and reel gears, as well recreational handline gear (O'Brien, 2010; GMRI, 2012). Additional information on cusk and some conservation efforts can be found at http://www.greateratlantic.fisheries.noaa.gov/protected/pcp/soc/cusk.html; please note, however, as cusk receive no substantive or procedural protection under the ESA (due to its candidate species status), this species will not be discussed further in this document.

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

Based on available information, it has been determined that this action is not likely to affect shortnose sturgeon, hawksbill sea turtles, blue whales, or sperm whales. This determination has been made because either the occurrence of the species is not known to overlap with the multispecies fishery and/or there have never been documented interactions between the species and the multispecies fishery. Further, this action is not likely to adversely affect Atlantic salmon, the Northwest Atlantic DPS of loggerhead or North Atlantic right whale critical habitats. This determination has been made because either the habitat does not occur within the range of the multispecies fishery or the fishery will not affect the primary constituent elements of the critical habitat, and therefore, will not result in the destruction or adverse modification of critical habitat.

4.5.3 Species Potentially Affected by the Proposed Action

The multispecies fishery may affect multiple protected species of cetacean, sea turtles, pinnipeds, and fish (see Table 31). Of primary concern is the potential for the fishery to directly interact (e.g., bycatch, entanglement) with these species. To understand the potential risk of an interaction, it is necessary to consider:

1. Species occurrence in the affected area and how the fishery will overlap in time and space with this occurrence; and

2. Records of protected species interaction with particular fishing gear types.

Please see section X (Affected Physical Environment) Figure Y, for additional details on the sub-regions comprising the fishery. Information on protected species interactions with fishery gear will be presented in Section 4.5.4.

4.5.3.1 Sea Turtles

<u>Status and Trends</u>

Table 32 includes the four ESA listed species of sea turtles that occur in the affected environment of the multi-species fisheries. Three of the four species are considered hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status of the other four species, as well as a description and life history of the species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant *et al.* 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS *et al.* 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

Table 32 Sea turtle species found in the affected environment of the multispecies fishery

Species	Listed At	Status	Trends
Green	Species Level	Endangered: Breeding populations in Florida and on the Pacific coast of Mexico Threatened: Other populations	Based on nesting data for four nesting sites, green sea turtle abundance is increasing.[1]
Kemp's ridley	Species Level	Endangered	Total annual number of nests at Rancho Nuevo, Tamaulipas, Mexico, the primary stretch of nesting beach, showed gradual increases in 1990s. Since 2009, nesting has not shown a notable increase.[2]
Loggerhead	Distinct Population Segment (DPS)	Northwest Atlantic DPS: Threatened	• Nesting data from 2008-2012 shows a positive nesting trend since 2007.[3] • In-water studies show an increasing trend in abundance from 3 of the 4 in-water sites in the southeast U.S.(the other site showed no discernable trend, and a decreasing trend at 2 sites in the Mid-Atlantic.[4]
Leatherback	Species Level	Endangered	Nesting counts in many areas show an increasing trend, while the largest nesting area (Suriname and French Guiana) show a stable trend.[5]
Sources: [1] Seminoff 2004; NMFS and USFWS 2007d. [2] NMFS and USFWSc; NMFS *et al*. 2011;Pena *et al*. 2012. [3] http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trends/[3] http://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trends/; NMFS and USFWS 2008; Witherington *et al*. 2009; and TEWG 2009. [4] TEWG 2009; NMFS and USFWS 2008. [5] NMFS and USFWS 2013			

Occurrence and Distribution

The multispecies fishery occurs in waters north of 35°N, where sea turtles occur seasonally. A general overview of sea turtle occurrence and distribution in the continental shelf waters of the Northwest Atlantic Ocean is provided below to assist in understanding how the multispecies fisheries overlaps in time and space with the occurrence of the sea turtles listed in Table 32.

Hard-shelled sea turtles

Distribution

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

Seasonality

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

Leatherback sea turtles

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

4.5.3.2 Large Cetaceans

Status and Trends

Table 33 provides the species of large whales that occur in the affected environment of the multispecies fisheries. For additional information on the biology, status, and range wide distribution of each whale species please refer to: Waring *et al*. 2014; NMFS 1991, 2005, 2010b, 2011, 2012.

Table 33 Large whale species in the affected environment of the multispecies fishery

Species	Designation Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock[7]
North Atlantic Right Whale	Endangered	Yes	454	positive and slowly accelerating	Yes
Humpback Whale	Endangered	Yes	823	positive	Yes
Fin Whale	Endangered	Yes	2,817	unknown	Yes
Sei Whale	Endangered	Yes	236	unknown	Yes
Minke Whale	Not listed	Yes	16,199	unknown	No

Occurrence and Distribution

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

The multispecies fishery occurs in waters north of 35^{o}N and whales may be present in these waters throughout the year. The multispecies fisheries and large whales are likely to co-occur in the affected area. To further assist in understanding how the multispecies fisheries overlaps in time and space with the occurrence of large whales, a general overview on species occurrence and distribution in the continental shelf waters of the affected environment of the

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

multispecies fishery is provided in the following table (Table 34). For additional information on the biology, status, and range wide distribution of each whale species please refer to: Waring *et al*. 2014; NMFS 1991, 2005, 2010b, 2011, 2012.

Table 34 Large cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries(1)

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

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

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

Species	Prevalence in Affected Area	High Use Areas and Approximate Months of Occurrence (if known)
Sources: NMFS 1991, 2005, 2010b, 2011, 2012; Hain *et al.* 1992; Payne 1984; Hamilton and Mayo 1990; Schevill *et al*. 1986; Watkins and Schevill 1982; Payne *et al*.1990; Winn et al. 1986; Kenney et al. 1986, 1995; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; 50 CFR 224.105; CETAP 1982; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012; Baumgartner *et al*. 2011; Cole *et al*. 2013; Risch *et al*. 2013; Waring *et al*. 2014.		

4.5.3.3 Small Cetacean

Status and Trends

Table 35 provides the species of small cetaceans that occur in the affected environment of the multispecies fisheries. For additional information on the biology, status, and range wide distribution of each small cetacean species please refer to Waring *et al*. 2014.

Table 35 Small cetacean species that occur in the affected environment of the multispecies fishery

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

***Southern Migratory Coastal Stock*)**					

Notes:
[1] Harbor porpoise are considered a strategic stock under the MMPA as the level of direct human-caused mortality has exceeded the PBR level for this species.[2,3] Both northern and southern migratory coastal stocks of bottlenose dolphins are considered a strategic stock under the MMPA as both stocks are designated as depleted under the Act.

Source: Waring *et al*. 2014

Occurrence and Distribution

Small cetaceans are found throughout the waters of the Northwest Atlantic Ocean. In the affected area, they can be found throughout the year from Cape Hatteras, North Carolina (35^{o}N), to the Canadian border (Waring *et al*. 2014). Within this range; however, there are seasonal shifts in species distribution and abundance. The multispecies fishery occurs in waters north of 35^{o}N. Small cetaceans may be present in these waters throughout the year, the multispecies fisheries and small cetaceans are likely to co-occur in the affected area. To further assist in understanding how the multi-species fisheries overlaps in time and space with the occurrence of small cetaceans, a general overview of species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery is provided in the following table (Table 36). For additional information on the biology, status, and range wide distribution of each species please refer to Waring *et al*. 2014,

Table 36 Small cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries1

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

	SNE, and GB sub-regions (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Occasionally found in the Gulf of Maine (GOM sub-region). • Seasonal shift in distribution: *__January-May__: occur from Cape Hatteras, NC, to Georges Bank (Mid-Atl, SNE, and GB sub-regions) *__Mid-summer-autumn__: moves onto Georges Bank; *Peak abundance* found on Georges Bank in the autumn (GB sub-region).
Risso's Dolphin	• Common in the continental shelf edge waters of the Mid-Atl, SNE, and GB sub-regions; rare in the GOM sub-region. • From approximately March-November: distributed along continental shelf edge from Cape Hatteras, NC, to Georges Bank (Mid-Atl, SNE, and GB sub-regions). • From approximately December-February: distributed in continental shelf edge of the Mid-Atlantic (SNE and Mid-Atl. sub-regions).
Harbor Porpoise	• Distributed throughout the continental shelf waters (primarily in waters less than 150 meters) of the Mid-Atlantic (north of 35^{o}N), SNE, GB, and GOM sub-regions. • Seasonal shifts in distribution: *__July-September__: Concentrated in the northern Gulf of Maine; low numbers can be found on Georges Bank (GOM and GB sub-regions). *__October-December__: widely dispersed in waters from New Jersey to Maine (SNE/Mid-Atl, GB, and GOM sub-regions). *__January-March__: intermediate densities in waters off New Jersey to North Carolina (SNE and Mid-Atl sub-regions); low densities found in waters off New York to Gulf of Maine (SNE, GB, and GOM sub-regions). *__April-June__: widely dispersed from New Jersey to Maine (SNE/Mid-Atl, GB, GOM sub-regions).
Bottlenose Dolphin:	__Western North Atlantic Offshore Stock__ • Spring-Summer: Primarily distributed along the outer continental shelf/edge-slope of the Mid-Atl, SNE, and GB sub-regions • Winter: Distributed in waters south of 35^{o}N __Western North Atlantic Northern Migratory Stock__ • Summer (July-August): distributed from the coastal waters from the shoreline to approximately the 25-m isobaths between the Chesapeake Bay mouth and Long Island, New York (Mid-Atl and SNE sub-regions). • Winter (January-March): Distributed in coastal waters south of 35^{o}N. __Western North Atlantic Southern Migratory Stock__ • Spring and Summer (April-August): distributed along coastal waters from North Carolina to Virginia (Mid-Atl and SNE sub-regions).

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

4.5.3.4 **Pinnipeds**

<u>Status and Trends</u>

Table 37 provides the species of small cetaceans that occur in the affected environment of the multispecies fisheries. For additional information on the biology, status, and range wide distribution of each pinniped species please refer to Waring *et al*. 2014.

Table 37 Pinniped species that occur in the affected environment of the multispecies fishery

Species	Listed Under the ESA	Protected Under the MMPA	Minimum Population Size	Population Trend	MMPA Strategic Stock
Harbor Seal	No	Yes	55,409 (in U.S. waters)	unknown	No
Gray Seal	No	Yes	Unknown for U.S. waters; total	positive	No

			Canadian population=331,000		
Harp Seal	No	Yes	Unknown for U.S. waters; total western North Atlantic stock=7.1 million	positive	No
Hooded Seal	No	Yes	Unknown for U.S. waters; minimum population size for the North Atlantic stock=512,000	unknown	No
Source: Waring *et al*. 2014					

Occurrence and Distribution

Pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. In the affected area, they are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35^{o}N) (Waring *et al*. 2007, 2014). The multi-species fishery occurs in waters north of 35^{o}N, and pinnipeds may be present in these waters throughout the year. The multispecies fisheries and pinnipeds are likely to co-occur in the affected area. To further assist in understanding how the multi-species fisheries overlaps in time and space with the occurrence of pinnipeds, a general overview of species occurrence and distribution in the affected environment of the multispecies fishery is provided in the following table (Table 38). For additional information on the biology, status, and range wide distribution of each species of pinniped please refer to Waring *et al*. 2007, 2014.

Table 38 Pinniped occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the multi-species fisheries

Species	Prevalence and Approximate Months of Occurrence (if known)
Harbor Seal	• Primarily distributed in nearshore waters from New Jersey to Maine (SNE/Mid-Atl, GOM sub-regions); however, increasing evidence indicates that their range is extending into waters as far south as Cape Hatteras, North Carolina (35^{o}N) (Mid-Atl sub-region). • Seasonal distribution: ***Year Round**: Nearshore waters of Maine (GOM sub-regions). ***September-May**: Nearshore waters from New England to New Jersey (GOM and SNE/Mid-Atl sub-regions); potential for some animals to extend range into waters as far south as Cape Hatteras, NC (Mid-Atl sub-region).
Gray Seal	• Distributed in nearshore waters from New Jersey to Maine (SNE/Mid-Atl, GOM sub-regions). • Seasonal distribution:

	*Year Round: Nearshore waters from Maine to Massachusetts (SNE and GOM sub-regions). *September-May: Nearshore waters from Rhode Island to New Jersey (SNE/Mid-Atl sub-regions).
Harp Seal	• Winter-Spring (approximately January-May): nearshore waters from Maine to New Jersey (GOM and SNE/Mid-Atl sub regions); represents the southern extent of the harp seal's range.
Hooded Seal	• Winter-Spring (approximately January-May): nearshore waters of New England (GOM and SNE sub regions).
Sources: Waring *et al*. 2007 (for hooded seals); Waring *et al*. 2014.	

4.5.3.5 Atlantic Sturgeon

Status

Table **39** lists the 5 DPSs of Atlantic sturgeon likely to occur in the affected area. For additional information on the biology, status, and range wide distribution of each distinct population segment please refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007).

Table 39. Atlantic Sturgeon DPSs occurring in the affected environment of the multispecies fishery

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

Occurrence and Distribution

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

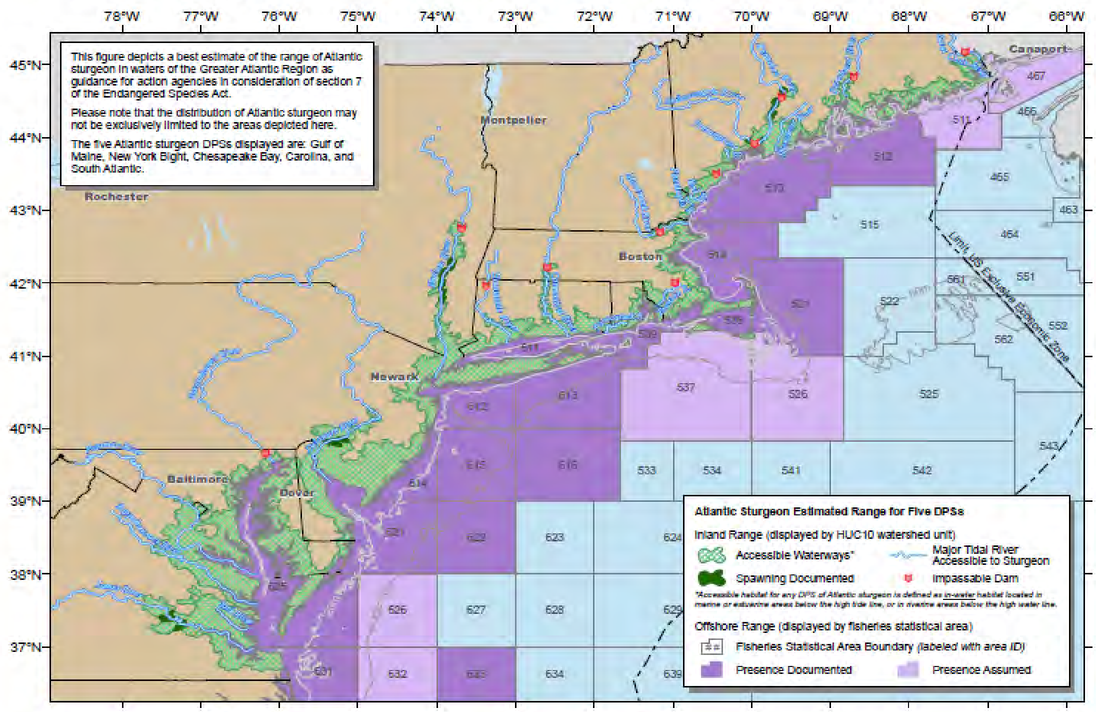


Figure 7 Estimated Range of Atlantic Sturgeon Distinct Population Segments (DPSs)
Source: http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/atlanticsturgeon.pdf.pdf

In the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein *et al*. 2004 a,b; Erickson *et al*. 2011; Dunton *et al*. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Ste
in *et al*. 2004a,b; Dunton *et al*. 2010; Erickson *et al*. 2011)). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon undertake seasonal movements along the coast. Seasonal trends in Atlantic sturgeon movements found by Dunton *et al*. 2010 and Erickson *et al.* 2011 show a coastwide distribution of Atlantic sturgeon during the spring and fall; a southerly (e.g., North Carolina, Virginia) and deeper water distribution during the winters; and a centrally located (e.g., Long Island to Delaware) and shallower water distribution during the summer. These studies provide some indication that Atlantic sturgeon are undertaking seasonal movements horizontally and vertically along the U.S. eastern coastline. While some studies show seasonal movement, inshore surveys conducted by the Northeast Fisheries Science Center in the region of the GOM show that Atlantic sturgeon have been caught in the fall, winter, and spring between the Saco and Kennebec Rivers (Dunton *et al*. 2010).

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

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

Numerous genetic studies show that all 5 DPSs comingle in varying percentages. Results from genetic studies (Waldman *et al*. 2013; O'Leary *et al*. 2014) have shown that coastal aggregations in New England and New York waters, regardless of location, were comprised of all 5 DPSs, with the NYB DPS consistently identified as the main contributor of the mixed aggregations, followed by the GOM, CB, SA, and Carolina DPSs. Results from the Northeast Fisheries Observer and At Sea Monitoring Program genetic assessment affirmed that in waters of the Mid-Atlantic, all 5 DPSs co-occur (Figure 2), with the percentage of each DPS estimated to be as follows: 51% NYB DPS; 22% SA DPS; 13 % CB DPS; 11% GOM DPS; 2 % Carolina DPS; and 1 % Canadian stock (Damon-Randall *et al*. 2013); however, these results have not been examined relative to the amount of observed fishing effort throughout the area. Although additional studies are needed to further clarify the DPS distribution and composition in non-natal estuaries and coastal locations, these studies provide some initial insight on DPS distribution and co-occurrence in particular areas along the U.S. eastern seaboard.

Based on the above studies and available information, Atlantic sturgeon from any of the 5 DPSs may be present during the operation of the multispecies fishery.

4.5.3.6 Atlantic Salmon (Gulf of Maine DPS)

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

Based on the above information, it is possible that the multispecies fishery will overlap in time and space with Atlantic salmon migrating northeasterly between U.S. and Canadian waters.

4.5.4 **Interactions Between Gear and Protected Resources**

Protected species described in Section 4.5.3 are all known to be vulnerable to interactions with various types of fishing gear. In the following sections, available information on gear interactions with a given species (or species group) will be provided. Please note, these sections are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on those gear types that are known to pose the greatest risk of interaction to the species under consideration.

4.5.4.1 Marine Mammals

Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery.[8]The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.

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

- **Tier 1-** considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are less than or equal to ten percent of the stock's potential biological removal rate (PBR), all fisheries associated with this stock fall into Category III.[9] -If mortality and serious injury rates are greater than ten percent of PBR, the following Tier 2, analysis occurs.

- **Tier 2** -considers fishery-specific mortality and serious injury for a particular stock. Specifically, this analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR to designate the fishery as a Category I, II, or III fishery (see Table 10).

Table 40 Descriptions of the LOF Tier 2 Fishery Classification Categories (50 CFR 229.2)

Category	Level of incidental mortality or serious injury of marine mammals	Annual mortality and serious injury of a stock in a given fishery is…

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

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

Category I	frequent	≥50% of the PBR level
Category II	occasional	between 1% and 50% of the PBR level
Category III	remote likelihood, or no known	≤1% of the PBR level

The following discussion on fishery interactions with marine mammals (large cetaceans, and small cetaceans and pinnipeds) is in reference to the Tier 2 classifications of fisheries in Table 40.

4.5.4.1.1 Large Cetaceans

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel and breed in many of the same ocean areas utilized for commercial fishing. The greatest entanglement risk to large whales is posed by fixed fishing gear (e.g., sink gillnet and trap/pot gear) comprised of lines (vertical or ground) that rise into the water column. Any line can become entangled in the mouth (baleen), flippers, and/or tail of the whale when the animal is transiting or foraging through the water column. Based on a number of studies (Johnson *et al*. 2005; NMFS 2014; Kenney and Hartley 2001; Hartley *et al*. 2003; Whittingham *et al*. 2005a,b; Waring *et al.* 2014), determining which part of fixed gear[10] creates the most entanglement risk for large whales is difficult . As a result, any type or part of fixed gear is considered to create an entanglement risk to large whales and should be considered potentially dangerous to large whale species (Johnson *et al.* 2005).

The effects of entanglement to large whales range from no injury to death (NMFS 2014; Johnson *et al*. 2005; Angliss and Demaster 1998; Moore and Van der Hoop 2012). "When… [whales] become fouled in gear, normal breathing and movement may be impaired or stopped completely. If the animal does manage to struggle free, portions of gear may remain attached to the body. This trailing gear, often made of durable synthetic material, may create excess drag, snag onto objects in the environment and impede normal behavior like breathing, feeding, movement, or breeding. Other effects include infections and deformations" (quote from Center for Coastal Studies, May 14, 2003, in NMFS 2014; Moore and Van der Hoop 2012). Considering these factors, the risk of injury or death in the event of an entanglement may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables (NMFS 2014). Available data indicates that entanglement in fishing gear is a significant source of serious injury or mortality for Atlantic large whales (Table 41; Waring *et al*. 2014).

As described in Section 4.5.3 (Species Potentially Affected), there are four species of large whales likely to occur in the affected area of the multispecies fishery: North Atlantic right

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

whale; humpback whale; fin whale; and minke whale. Table 41 summarizes all known serious injury and fatal entanglements of humpback, fin, sei, minke, and North Atlantic right whales from 1997 to 2011 (NMFS 2014; Waring *et al*. 2014). The entanglement data comes from the 2014 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Report and pertains only to entanglements that the National Marine Fisheries Service considers to be the primary cause of serious injury or death to a whale (Waring *et al*. 2014).[11] In addition, only entanglement data from U.S. waters is presented.

Table 41 Summary of confirmed serious injury and mortality of fin, minke, humpback, sei, and North Atlantic right whales from 1997-2011 due to fisheries entanglements

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

Notes: [1] "Annual Fishing Mortality" refers to mortality and serious injury resulting from large whale interactions with commercial fisheries.
Sources: NMFS 2014; Waring *et al*. 2014.

As many entanglement events go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, it is important to recognize that the information presented in Table 41 likely underestimates the rate of large whale serious injury and mortality due to entanglement. Further, scarring data suggests that entanglements may be occurring more frequently than the observed incidences indicate (i.e., Table 41; NMFS 2014). For instance, a study conducted by Robbins (2009) analyzed entanglement scars observed in photographs taken during 2003-2006. This analysis suggests high rates of entanglements of Gulf of Maine humpback whales in fishing gear. In an analysis of the scarification of right whales, 519 of 626 (82.9%) whales examined during 1980-2009 were scarred at least once by fishing gear (Knowlton *et al*. 2012). Further research using the North Atlantic Right Whale Catalogue has indicated that, annually, between 8.6% and 33.6% of right whales have been involved in entanglements (Knowlton *et al*. 2012). Based on this information, care should be taken when interpreting entanglement data as it is likely more incidences of entanglement are occurring than observation alone indicates.

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

Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the (Northwest) Atlantic Ocean (Table 40). As humpback, fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA (see Section 1.1.3 Species Potentially Affected). Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan (TRP) for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, In 1997, the ALWTRP was implemented; however, since 1997, the Plan has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In fact, two recent adjustments include the "Sinking Groundline Rule," that became effective in April 2009 (September 2, 2008; 73 FR 51228), and the "Vertical Line Rule," that became effective August 26, 2014 (June 27, 2014; 79 FR 36586).[12]

NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP or Plan)) to reduce serious injury to, or mortality of, large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[13] The Plan was implemented in 1997 and has since been amended. Broadly speaking, the Plan consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries (http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/; 73 FR 51228; 79 FR 36586). Specifically, the Plan identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in the Northeast, Mid-Atlantic, and Southeast regions of the U.S.; these fisheries must comply with all regulations of the Plan.[14]
The following table (Table 42) provides a brief summary of the specified gear modification requirements and restrictions under the ALWTRP for trap/pot or gillnet fisheries in the Northeast or Mid-Atlantic region of the U.S. As the affected environment of the proposed action will not extend into the Southeast region, those provisions of the Plan will not be discussed further. For further details on the gear modification requirements and restrictions

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

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

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

under the ALWTRP please see:
http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/

Table 42 Summary of gear modification requirements and restrictions for the Northeast and Mid-Atlantic Trap/Pot and Gillnet Fisheries under the Atlantic Large Whale Take Reduction Plan

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

Except for the universal gear requirements, the additional gear modification requirements and restrictions identified in Table 42 will vary by location (i.e., management areas) and dates. The following table (Table 43) and figures (Figure 8 and Figure 9) provide the Management Areas recognized by the ALWTRP in the Northeast and Mid-Atlantic; for details on the specific gear modification requirements and restrictions in each Management Area please see http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/

Table 43 Northeast and Mid-Atlantic Gillnet or Trap/Pot Management Areas under the Atlantic Large Whale Take Reduction Plan

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

Gillnet	• Stellwagen Bank/Jeffreys Ledge Restricted Area • Great South Channel Restricted Gillnet Area • Other Northeast Gillnet Waters (Northeast)
Mid-Atlantic Trap/Pot	• Southern Nearshore Trap/Pot Waters • Offshore Trap/Pot Waters (Mid-Atlantic)
Mid-Atlantic Gillnet	• Other Northeast Gillnet Waters (Mid-Atlantic) • Mid/South Atlantic Gillnet Waters

Figure 8 Summary of Trap/Pot Management Area under the Atlantic Large Whale Take Reduction Plan

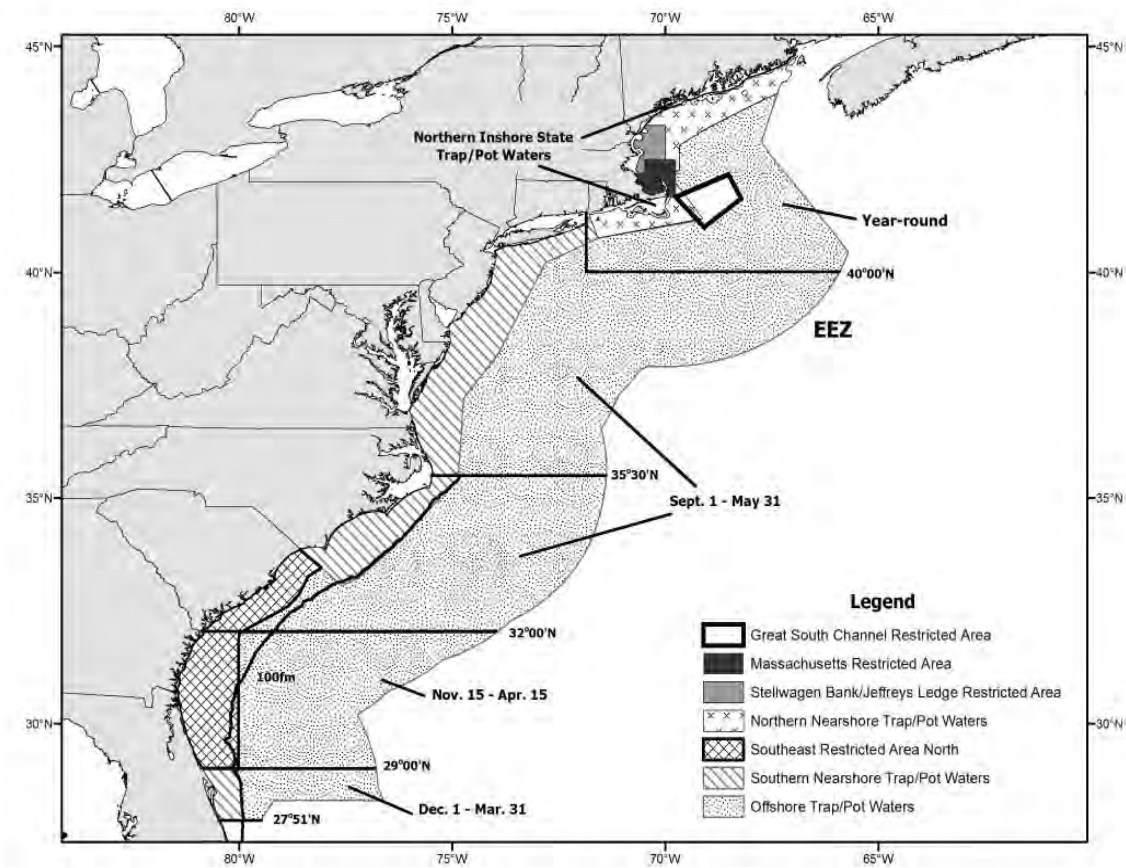
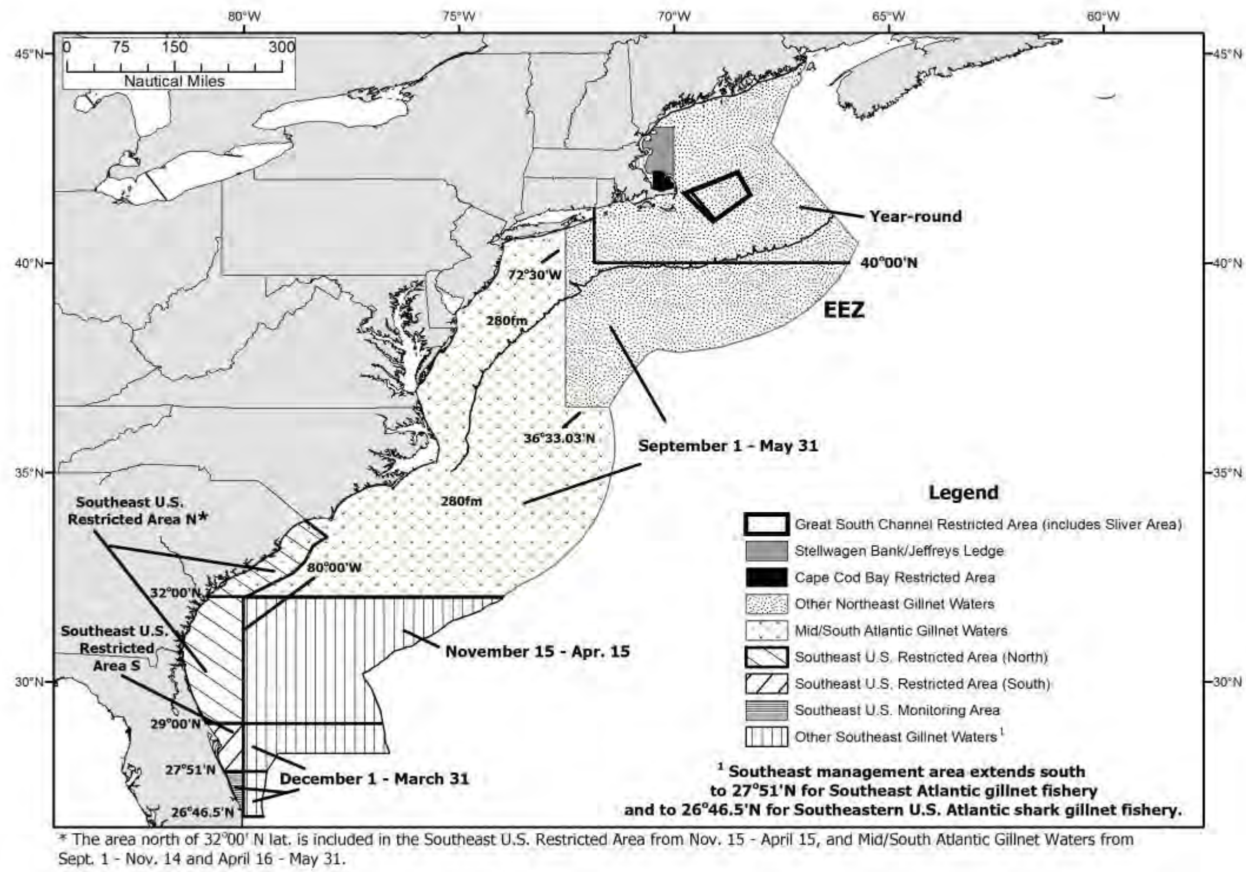


Figure 9 Summary of Gillnet Management Areas under the Atlantic Large Whale Take Reduction Plan



4.5.4.1.2 *Small Cetaceans and Pinnipeds*

Small cetaceans and pinnipeds are found throughout the waters of the Northwest Atlantic (see Section 4.5.3). As they feed, travel and breed in many of the same ocean areas utilized for commercial fishing, they are at risk of becoming entangled or bycaught in various types of fishing gear used in the multispecies fishery (see Table 44), with interactions resulting in serious injury or mortality to the animal. As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Table 44 provides information on the small cetacean and pinniped species that have been observed incidentally injured and/or killed by the Category I and II fisheries that occur in the affected environment of the multispecies fishery. Information is also provided on the most recent mean annual mortality estimates for those species observed incidentally injured/killed in the fishery from 2007-2011.[15] Please note, Table 44 does not provide a comprehensive list of all species affected by each fishery, it only addresses those

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

species that occur in the affected environment of the multispecies fishery (see Section 4.5.3). For a comprehensive list of species affected by each category of fishery, please see the recently issued LOF.

Table 44 Small cetacean and pinniped species observed seriously injured and/or killed by Category I, II, and III fisheries in the affected environment of the multispecies fishery. A (1) indicates those species driving the fisheries classification.

Category I			
Fishery	**Species Observed Injured/Killed**	**Observed in 2007-2011**	**Mean Annual Mortality[1]**
Northeast Sink Gillnet	Bottlenose dolphin (offshore)	N	N/A
	Harbor porpoise (1)	Y	462
	Atlantic white sided dolphin	Y	33
	Short-beaked common dolphin	Y	41
	Pilot whale	Y	1
	Harbor seal	Y	346
	Gray seal	Y	1,043
	Harp seal	Y	208
Mid-Atlantic Gillnet	Bottlenose dolphin (Northern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (Southern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (offshore)	N	N/A
	Long-finned pilot whale	N	N/A
	Short-finned pilot whale	N	N/A
	White-sided dolphin	N	N/A
	Harbor porpoise	Y	198
	Short-beaked common dolphin	Y	12
	Risso's dolphin	Y	6.8
	Harbor seal	Y	49
	Harp seal	Y	63
	Gray seal	Y	57
Pelagic Longline	Long-finned pilot whale (1)	N	N/A
	Risso's dolphin	Y	10
	Short-finned pilot whale (1)	Y	119

	Short-beaked common dolphin	Y	1.7
	Bottlenose dolphin (offshore)	Y	1.7
Northeast/Mid-Atlantic American Lobster Trap/Pot	Harbor seal	N	N/A
Category II			
Mid-Atlantic Mid-Water Trawl-Including Pair Trawl	Bottlenose dolphin (offshore)	N	N/A
	Risso's dolphin	Y	0.2
	White-sided dolphin (1)	Y	6
	Short-beaked common dolphin	Y	0.6
	Long and short-finned pilot whales	Y	2.4
	Gray seal	Y	0.2
	Harbor seal	Y	0.2
Northeast Mid-Water Trawl-Including Pair Trawl	White-sided dolphin	N	N/A
	Short-beaked common dolphin	N	N/A
	Long and short-finned pilot whales (1)	Y	4
	Harbor seal	Y	0.7
Northeast Bottom Trawl	Harp seal	Y	0.4
	Harbor seal	Y	0.8
	Gray seal	Y	9.2
	Long and short-finned pilot whales	Y	10
	Short-beaked common dolphin	Y	19
	White-sided dolphin (1)	Y	73
	Harbor porpoise	Y	4.5
	Bottlenose dolphin (offshore)	Y	20
	Risso's dolphin	Y	2.5
Mid-Atlantic Bottom Trawl	White-sided dolphin	Y	4
	Long and short-finned pilot whales (1)	Y	26
	Short-beaked common dolphin (1)	Y	96
	Risso's dolphin (1)	Y	42
	Bottlenose dolphin (offshore)	Y	20
	Harbor seal	Y	0.2
Northeast Anchored Float	Harbor seal	N	N/A

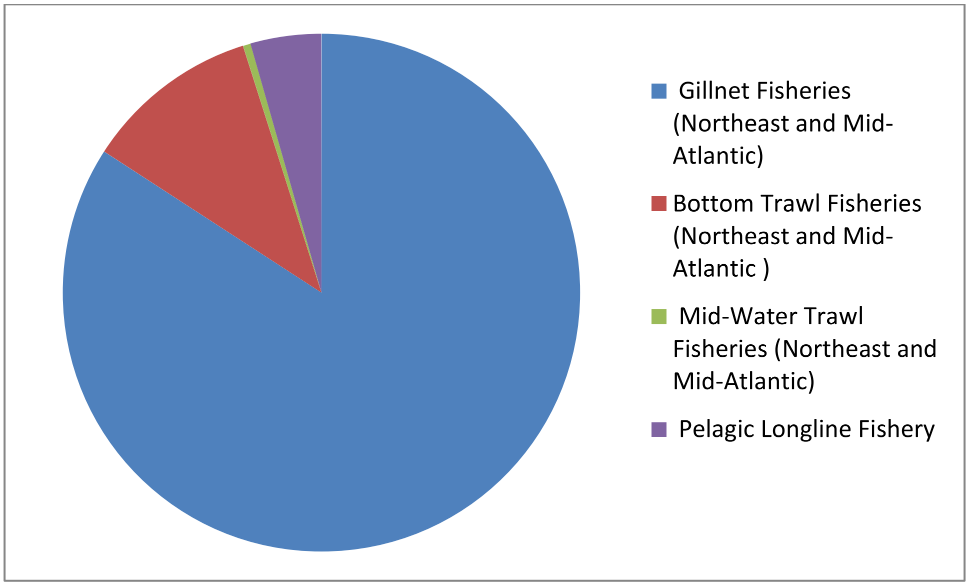
Gillnet	White-sided dolphin	N	N/A
Atlantic Blue Crab Trap/Pot	Bottlenose dolphin (Northern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (Southern Migratory coastal) (1)	N	N/A
Mid-Atlantic Haul/Beach Seine	Bottlenose dolphin (Northern Migratory coastal) (1)	N	N/A
	Bottlenose dolphin (Southern Migratory coastal) (1)	N	N/A

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

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

The information provided in Table 44 shows that of the Category I and II fisheries in the affected environment of the multispecies fishery the Northeast and Mid-Atlantic gillnet fisheries, followed by the bottom trawl fisheries (Category I and II fisheries, respectively) pose the greatest risks of serious injury and mortality to small cetaceans and pinnipeds (Figure 6). Based on the available observer data from 2007-2011 (Table 44), approximately 84% of the total mean annual mortality to marine mammals (small cetaceans and seals, large whales excluded) is attributed to gillnet fisheries, followed by bottom trawl (10.94%), pelagic longline (4.42%) and mid-water trawl (0.48%) fisheries.

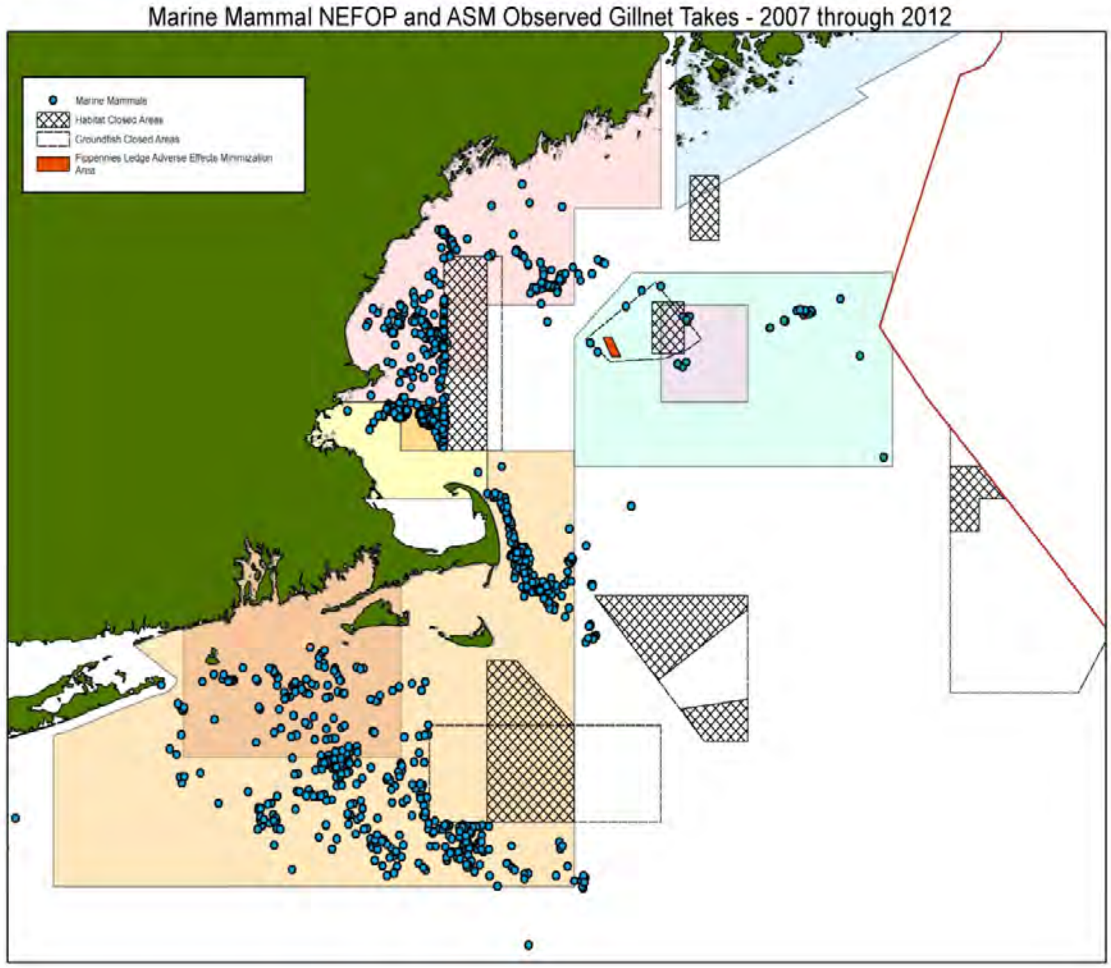
Figure 10 2007-2011 total mean annual mortality of small cetaceans and pinnipeds by Category I and II Fisheries.



Although there are multiple Category I and II fisheries that result in the serious injury and morality of small cetaceans and pinnipeds, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For instance, the following figures (Figure 11, and Figure 12) depict observed marine mammal takes (large whales excluded) in gillnet and trawl gear in the GOM, GB, and SNE sub-regions of the multispecies fisheries from 2007-2011.[16] As depicted in Figures 7 and 8, over the last 5 years, there appears to be particular areas of the GOM, GB, and SNE sub-regions where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence. Although uncertainties, such as shifting fishing effort patterns and data on true density (or even presence/absence) for some species, remain, the available observer data, as depicted in (Figure 11, and Figure 12), does provide some insight into areas in the ocean where the likelihood of interacting with a particular species is high and therefore, provides a means to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds.

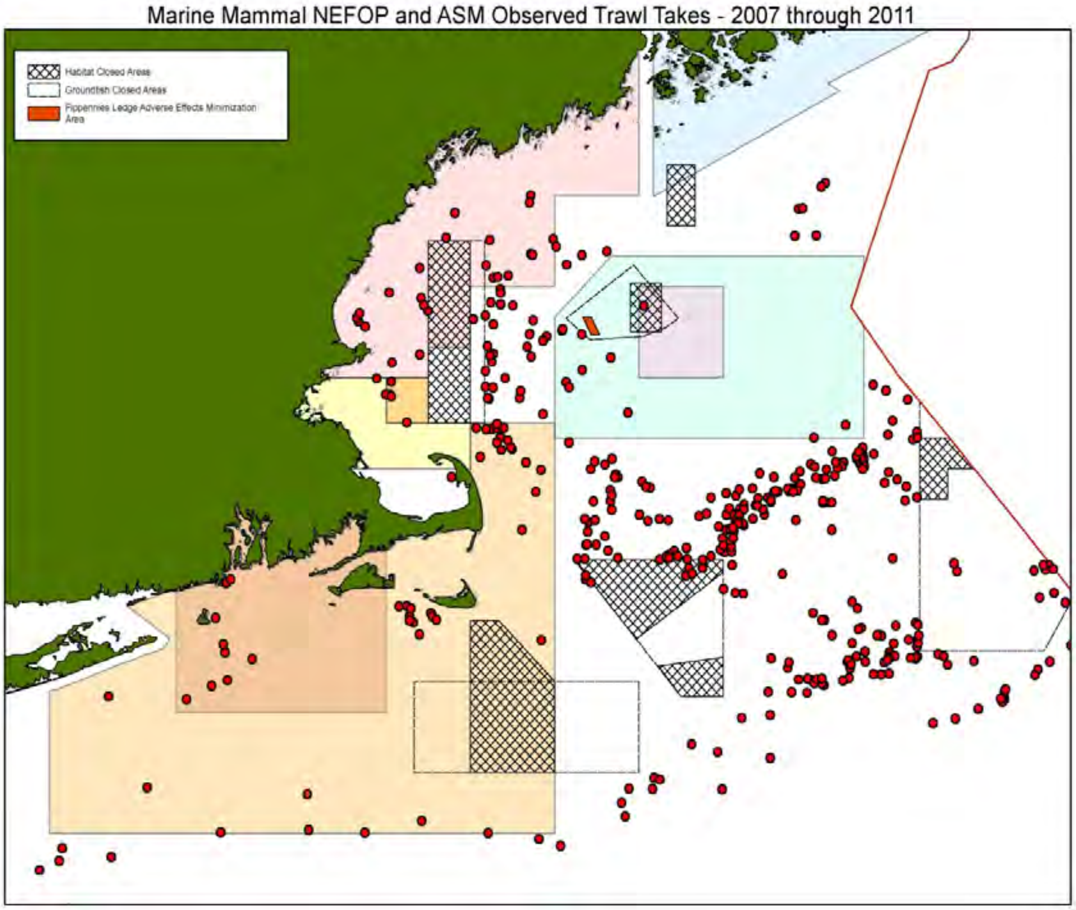
[16] Additional maps of marine mammal takes in various fishing gear can be found in Waring *et al*. 2014.

Figure 11 Map of marine mammal bycatch in gillnet gear in the New England region (excluding large whales) observed by traditional fishery observers and at sea monitors between 2007 and 2011.



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

Figure 12 Map of marine mammal bycatch in trawl gear in the New England region (excluding large whales) observed by traditional fishery observers and at sea monitors between 2007 and 2011.



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

Several species of small cetaceans and pinnipeds listed in Table 44 have experienced such great losses to their populations as a result of interactions with Category I and II fisheries that they are now considered strategic stocks under the MMPA.[17] These species are the harbor porpoise, the Western North Atlantic Northern Migratory Coastal Stock of bottlenose dolphin and the Western North Atlantic Southern Migratory Coastal Stock of bottlenose dolphin. Section 118(f)(1) of the MMPA requires the preparation and implementation of a TRP for any strategic marine mammal stock that interacts with Category I or II fisheries. As a result, the Harbor Porpoise TRP (HPTRP or Plan) and the Bottlenose Dolphin TRP (BDTRP or

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

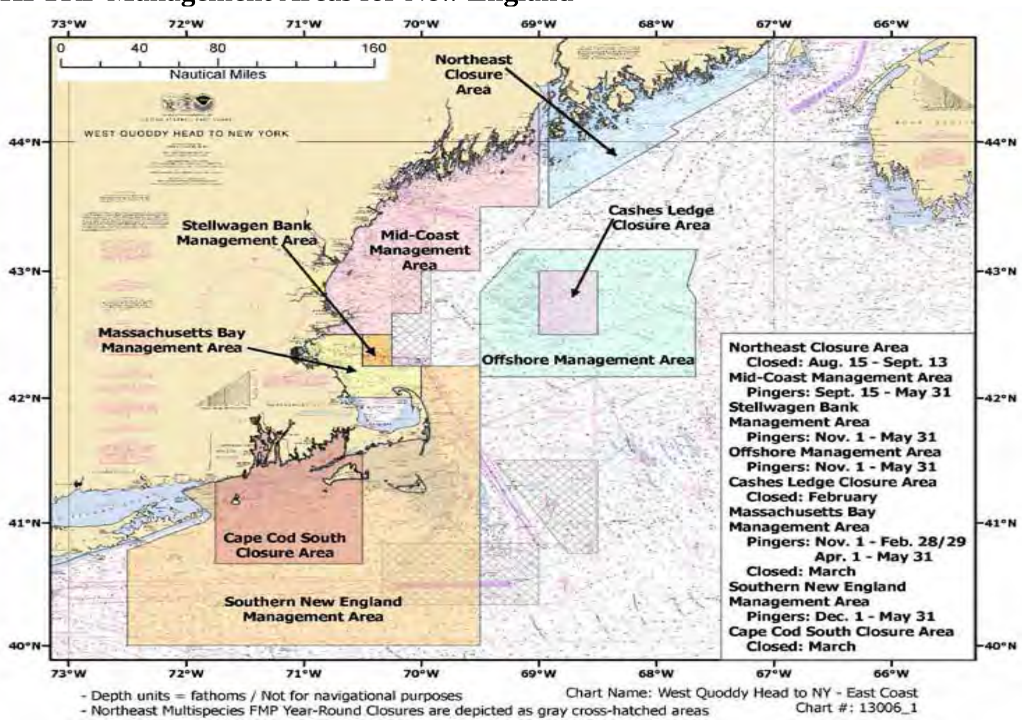
Plan) were developed and implemented for these species. The following provides a brief overview and summary for each TRP; however, additional information on each TRP can be found at: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/ or http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm

Harbor Porpoise Take Reduction Plan (HPTRP)

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

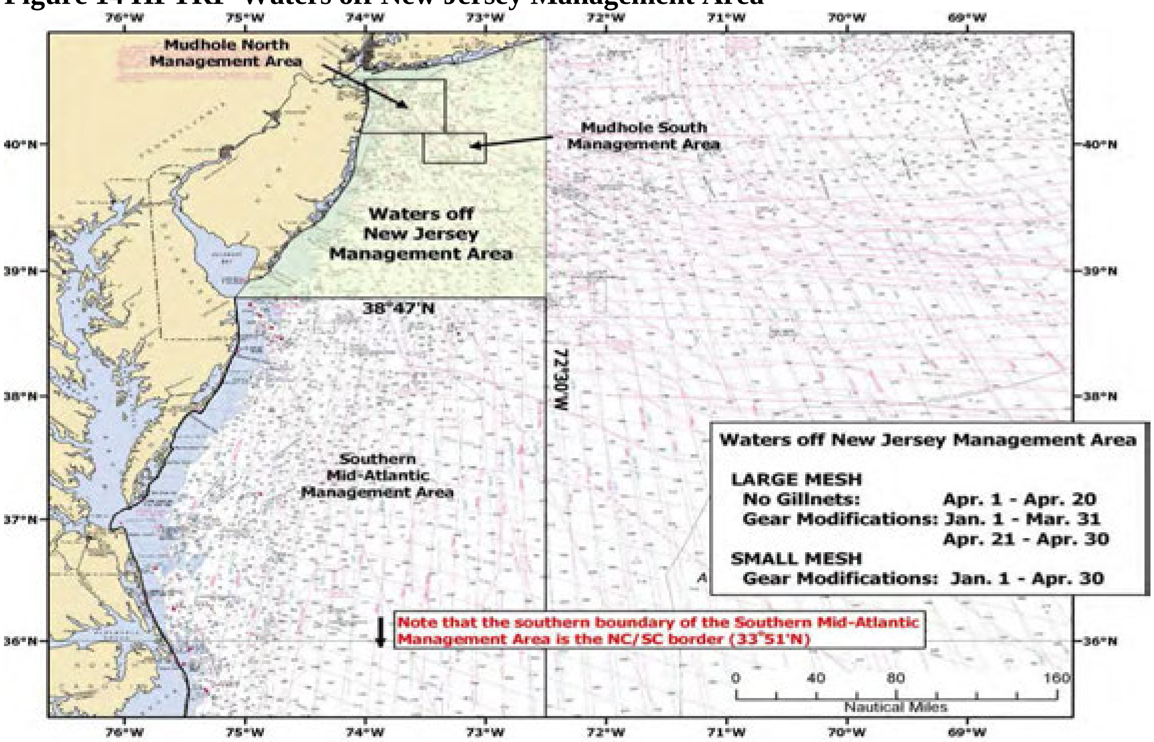
- **New England Region**: The New England component of the HPTRP pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. This portion of the Plan includes time and area closures, as well as closures to multispecies gillnet fishing unless pingers are used in the manner prescribed in the TRP regulations (Figure 9). For additional details see 50 CFR 229.33 and the outreach guide at http://www.greateratlantic.fisheries.noaa.gov/prot_res/porptrp/doc/HPTRPNewEnglandGuide.pdf).

Figure 13 HPTRP Management Areas for New England



- **Mid-Atlantic Region:** The Mid-Atlantic portion of the HPTRP pertains to the Mid-Atlantic shoreline from the southern shoreline of Long Island, New York to the North Carolina/South Carolina border. It includes four management areas (Waters off New Jersey, Mudhole North (located in Waters off New Jersey Management Area), Mudhole South (located in Waters off New Jersey Management Area), and Southern Mid-Atlantic), each with time and area closures to gillnet fishing unless the gear meets certain specifications. Additionally, during regulated periods, gillnet fishing in each management area of the Mid-Atlantic is regulated differently for small mesh (> 5 inches to < 7 inches) and large (7-18 inches) mesh gear. The Plan also includes some time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Figures 10 and 11 provide a depiction of the Mid-Atlantic Management Areas. For additional details see 50 CFR 229.34 and the outreach guide at http://www.greateratlantic.fisheries.noaa.gov/prot_res/porptrp/doc/HPTRPMidAtlanticGuide_Feb%202010.pdf

Figure 14 HPTRP-Waters off New Jersey Management Area



Notes:

Mudhole North Management Area Small Mesh

Gear Modification: Jan. 1- Apr. 30
No Gillnet: Feb. 15-Mar. 15

Mudhole North Management Area Large Mesh

Gear Modification: Jan. 1- Apr. 30
Mar. 31;
No Gillnet: Feb. 15-Mar. 15; Apr. 1-Apr. 20

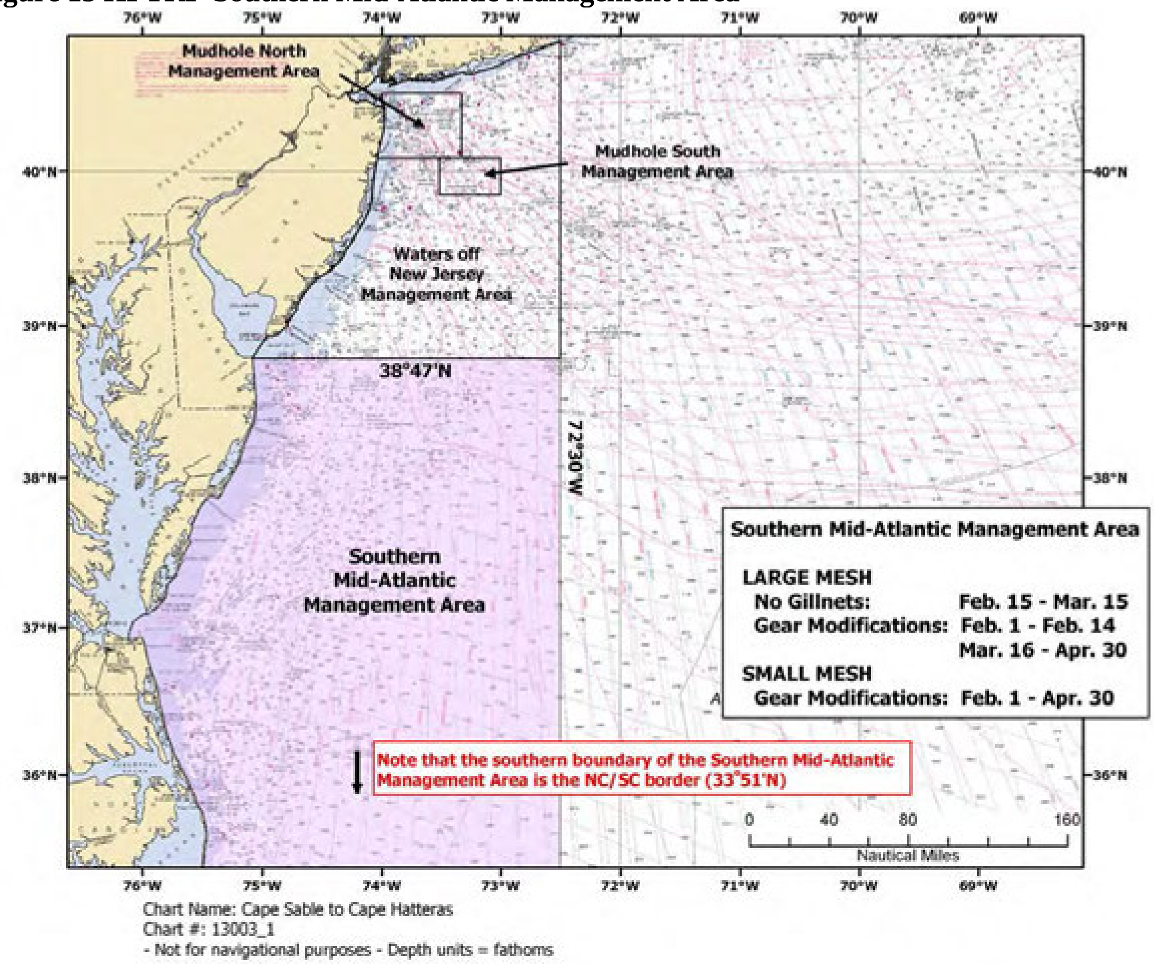
Mudhole South Management Area Small

Gear Modification: Jan. 1- Jan.31; Mar. 16-Apr.30
No Gillnet: Feb. 1-Mar.15

Mudhole South Management Area Large

Gear Modification: Jan. 1- Jan.31; Mar. 16-Mar. 31;
Apr. 21- Apr. 30
No Gillnet: Feb. 1-Mar.15; Apr. 1- Apr. 20

Figure 15 HPTRP-Southern Mid-Atlantic Management Area



Bottlenose Take Reduction Plan

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

4.5.4.2 Sea Turtles

As described in section 4.5.3, sea turtles are widely distributed in the waters of the Northwest Atlantic. As a result, sea turtles often occupy many of the same ocean areas utilized for commercial fishing and therefore, interactions with fishing gear are possible. Sea turtles have been incidentally injured or killed in various gear types (e.g., gillnets, trawls, hook and line gear, dredge); however, of the gear types that could be possibly used in the multispecies fishery, trawl and gillnet pose the greatest risk to sea turtles and therefore, will be the focus of the following discussion. In addition, although sea turtle interactions with trawl and gillnet gear have been observed in waters from the Gulf of Maine to the Mid-Atlantic, most of the observed interactions have occurred in the Mid-Atlantic. As few sea turtle interactions have been observed in the Gulf Maine and Georges Bank regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl or gillnet gear in these regions and therefore, produce a bycatch estimate for these regions. As a result, the following bycatch estimates are based on observed sea turtle interactions in trawl and gillnet gear in the Mid-Atlantic.

In a study done by Warden (2011a), it was estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border) was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but being released through a Turtle Excluder Device.[18] Of the 292 average annual observable loggerhead interactions, approximately 44 of those were adult equivalents (Warden 2011a).[19] This estimate is a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated to be 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a). Warden (2011b), using species landed, also estimated total loggerhead interactions attributable to managed species. Five loggerhead interactions (estimated observable and unobservable but quantifiable) were attributed to Northeast multispecies. In addition, green, Kemp's ridley, and leatherback sea turtles have been documented in bottom trawl gear in areas that overlap with the Northeast groundfish fishery (NEFSC FSB database). One of these, a leatherback sea turtle, was captured on trip where the top landed species was whiting, while another sea turtle (unknown species) was captured on trip where the top landed species was pollock.

Murray (2013) conducted an assessment of loggerhead and unidentified hard-shell turtle interactions in Mid-Atlantic gillnet gear from 2007-2011. Based on Northeast Fisheries Observer Program data from 2007-2011, interactions between loggerhead and hard-shelled

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

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

turtles (loggerheads plus unidentified hard-shelled) and commercial gillnet gear in the Mid-Atlantic averaged 95 hard-shelled turtles and 89 loggerheads (equivalent to 9 adults) annually (Murray 2013). However, average estimated interactions in large mesh gear in warm, southern Mid-Atlantic waters have declined relative to those from 1996-2006 (Murray 2009), as did the total commercial effort (Murray 2013). Murray (2013) also estimated interactions by managed species landed in gillnet gear from 2007-2011. An estimate was not provided for the Northeast multispecies fisheries; however, takes have been observed in sink gillnet fisheries targeting other species. One of these was documented by an at sea monitor north of 42° N latitude. Leatherback, Kemp's ridley, and green sea turtles have also been documented in Mid-Atlantic gillnet gear by fishery observers (NEFSC FSB database), with observed takes of Kemp's ridley and leatherback sea turtles having occurred in areas that overlap with the Northeast multispecies fishery.

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

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

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

4.5.4.3 Atlantic Sturgeon

As described in Section 4.1.3, the marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range, although genetic analyses suggests that the distribution of each varies within that range (King *et al*. 2001; Laney *et al*. 2007; Dunton *et al*. 2012; Wirgin *et al*. 2012; Waldman *et al*. 2013; O'Leary *et al*. 2014). Three separate publications using different information sources reached the same conclusion; Atlantic sturgeon occur primarily in waters less than 50 meters (although deeper waters are also used), aggregate in certain areas, and exhibit seasonal movement patterns (see Stein *et al*. 2004b; Dunton *et al*. 2010; Erickson *et al*. 2011; see Section 4.1.3 for additional details). These characteristics of Atlantic sturgeon occurrence and distribution result in Atlantic sturgeon occupying many of the same ocean areas utilized for commercial fishing and therefore, occupying areas in which interactions with fishing gear are possible.

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

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

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

4.5.4.4 Atlantic Salmon

As described in section 4.1.3, the marine range of the Gulf of Maine Distinct Population Segment extends from the Gulf of Maine (primarily northern portion), to the coast of Greenland (NMFS and USFWS 2005; Fay *et al*. 2006). Although the distribution of Atlantic salmon in the marine environment likely overlaps with commercial fisheries, there have been a low number of observed interactions with fisheries and various gear types. According to the Biological Opinion issued by NMFS Greater Atlantic Regional Fisheries Office on December 16, 2013, NMFS Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer and At-Sea Monitoring Programs documented a total of15 individual salmon incidentally caught on over 60,000 observed commercial fishing trips from 1989 through August 2013 (NMFS 2013;Kocik *et al*. 2014). Specifically, Atlantic salmon were observed bycaught in gillnet (11/15) and bottom otter trawl gear (4/15), with 10 of the incidentally caught salmon listed as "discarded" and five reported as mortalities (Kocik (NEFSC), pers. comm (February 11, 2013) in NMFS 2013). The genetic identity of these captured salmon is unknown; however, the NMFS 2013 Biological Opinion considers all 15 fish to be part of the Gulf of Maine Distinct Population Segment, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts).

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

4.6 HUMAN COMMUNITIES/SOCIAL-ECONOMIC ENVIRONMENT

This EA considers the operations plans of the FY 2015/16 sectors and evaluates the effect they may have on people's income, employment, 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 such impacts could be solely experienced by individual sector participants, it is more likely that impacts would be experienced across communities, gear types, and/or vessel size classes.

The remainder of 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 participants as well as their homeports. Because some of the changes being considered for sector operation plans in 2015/2016 could have an effect on the lobster fishery, an overview of that fishery is included as well.

The information contained in this section provides background information and highlights some of the current industry trends. For a more detailed economic analysis of the Northeast multispecies fishery, see (Murphy T, Kitts A, Demarest C, Walden J. 2015). 2013 Final report on the performance of the northeast multispecies (groundfish) fishery (May 2013 -April 2014). US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-02; 106 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications/).

4.6.1 Overview of New England Groundfish Fishery

New England's fishery has been identified with groundfishing 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 related primarily to cod and haddock. Today, the Northeast Multispecies FMP (large-mesh and small-mesh) includes a total of 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 shore-side 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).

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.

In the early 1960s, 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 1970s, 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 1970s. 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 1980s (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 1980s until reaching a more or less constant level of around 40,000 tons (36,287 mt) annually since the mid 1990s.

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 2004 rule also 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 FY 2010, the NMFS Regional Administrator announced that, in addition to a previously stated 18 percent reduction in DAS, interim rules would be implemented to reduce fishing mortality during FY 2009. 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
- a reduction in some groundfish allocations (NOAA 2009).

In 2007, the Northeast Multispecies fishery included 2,515 permits. Of these permits about 1,400 were limited access, and 658 vessels actively fished. Those vessels included a range of gear types including hook, bottom longline, gillnet, and trawlers (NEFMC 2009a). In FY 2009, between 40 and 50 of these vessels were members of the GB Cod Sectors. The passage of Amendment 16 prior to FY 2010 issued in a new era of sector management in the New England groundfish fishery. Over 50 percent of eligible northeast groundfish multispecies permits and over 95 percent of landings history were associated with sectors in FY 2010. Approximately 56 percent of the eligible northeast groundfish multispecies permits constituting between approximately 99.4 percent and 77.5 percent of the various species ACLs were included in sectors for FY 2011. The remaining vessels were common pool groundfishing vessels.

Amendment 16 to the Northeast Multispecies Fishery Management Plan (FMP) was finally implemented for the New England groundfish fishery starting on May 1st 2010, the start of the 2010 fishing year. The new management program contained 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. Sectors received ACE for nine of 13 groundfish species (14 stocks + quotas for Eastern U.S./ 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 seventeen 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 60% of limited access permits participated in one of 16 sectors or one of 2 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 the 2011 fishing year, 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. 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 are also a reflection of the current system of sector management.

2012 signified the third year of the sector management regime. From 2011 to 2012 the number of groundfish limited access eligibilities for sector members increased by 22 and the number of eligibilities for the common pool decreased by 36. During FY2012, 61% of limited access permits participated in sectors. Preliminary sector sub-ACLs for allocated groundfish species accounted for almost 99% of the total groundfish sub-ACL in 2012, with the remaining 1% being assigned to the common pool (Northeast Multispecies Fishery Framework Adjustment 47).

In FY2013, the number of groundfish limited access eligibilities for sector members stayed relatively constant (increasing by 1) while the number of eligibilities for the common pool decreased by 29. Sectors again accounted for around 60% of all limited access permits with the sector sub-ACL accounting for 98% of the total commercial groundfish ACL.

4.6.2 Trends in the Number of Vessels

In 2010, the first year of sector management, the Northeast Multispecies fishery issued 1,383 permits, not including groundfish limited access eligibilities held as Confirmation of Permit History (CPH). Out of these permits, 753 vessels belonged to a sector and 636 remained in the common pool[20]. Not all permitted vessels were active and not all active vessels fished for groundfish. Of the 753 sector vessels issued groundfish permits, only 435 were considered active, having revenue from any landed species, and only 303 of those had revenue from at least one groundfish trip[21]. Among common pool vessels, 419 were considered active, and only 142 vessels had made at least one groundfish trip (**Table 45**).

The overall trend since the start of sector management has been a decreasing number of vessels with a limited access groundfish permit. By 2011 the total number of vessels with a limited access groundfish permit decreased slightly to 1,279. The number of vessels belonging to a sector actually increased to 772 in 2011 while the number of vessels in the Common Pool decreased to 514. Of the 772 sector vessels issued a groundfish permit in 2011, 443 were considered active, and only 301 of those had revenue from at least one groundfish trip. Among common pool vessels, 337 were considered active, and only 119 vessels had made at least one groundfish trip. From 2011 to 2012, the number of groundfish permits decreased further to 1,177 and the number of active vessels decreased to 763. During that same time period the number of active sector vessels increased slightly (2 vessels) along with the number of sector vessels with revenue from a groundfish trip (1 vessels). Conversely, the common pool saw declines in the number of active vessels (337 to 320) and those with revenue from one groundfish trip in 2012 (119 to 99).

The total number of active groundfish vessels continues to decline; the fishery lost 119, or 14.0%, of its active vessels over the 2010-2013 period (Table 43). In 2013, there were 735 active vessels in the limited access groundfish fleet, with 419 vessels (57%) enrolled in sectors and 316 vessels (43%) remaining in the common pool. From 2012 to 2013, the number of active vessels enrolled in sectors decreased by 26 vessels and the number of active vessels in the common pool decreased by 4 vessels (Table 43).

[20] The values of some of the metrics reported in Section 4.6 have been updated from previous reports. This is because vessels that are exclusively party boat/charter vessels are no longer included in the analysis since they cannot sell their landings.

[21] Note: A 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. The data for this declaration is taken from different source materials (VMS, etc.) than the data presented earlier in Section 4.1, and for the reasons stated in Section 4.1, this data may be slightly different than what is presented elsewhere in the document.

Table 45. Number of vessels by fishing year (May through April).

	2010			2011			2012			2013	
	Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool	Total	Sector Vessels
Vessels with a limited access groundfish permit	1,383	753	636	1,279	772	514	1,177	720	463	1,119	674
... those with revenue from any species**	854	435	419	777	443	337	763	445	320	735	419
... those with revenue from at least one groundfish trip	445	303	142	418	301	119	400	302	99	327	245
... those with no landings	529 (38%)	318 (42%)	217 (34%)	502 (39%)	329 (43%)	177 (34%)	414 (35%)	275 (38%)	143 (31%)	384 (34%)	255 (38%)

*These numbers exclude groundfish limited access eligibilities held as Confirmation of Permit History (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 2010-2012 data for either sector or common pool. It is also important to note that 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.
**Active vessels in this report received revenue from any species while fishing under a limited access groundfish permit

A key aspect of Amendment 16, and catch share programs in general, is the ability to jointly decide how a sector will harvest its ACE through redistribution within a sector and the ability to transfer ACE between sectors. Because it is then not possible to identify the extent to which inactive vessels in a sector may benefit if other sector vessels harvest their allocation, changes in the number of inactive vessels may describe a transfer of allocation and not necessarily permit holders with zero net benefit. In 2010, 529 vessels (38%) were inactive (no landings). Of these inactive vessels, 318 were sector vessels and 217 were common pool vessels. By 2011 the total number of inactive vessels had declined to 502 but because the number of vessels with a limited access groundfish permit declined as well, there was a small increase in the relative proportion of inactive vessels to 39%. The number of inactive sector vessels increased to 329 in 2011, but because the number of vessels with a limited access groundfish permit belonging to a sector also increased, the relative proportion of inactive sector vessels increased by less than 1% (42.2% to 42.7%). 177 common pool vessels were inactive in 2011, which is about 34% of the Common Pool. In 2012, the number of inactive vessels decreased in aggregate to 414 and the proportion of permits that were inactive dropped from 39% to 35%. Likewise, the number of inactive sector vessels decreased to 275 and the proportion of sector permits that were inactive decreased from 43% to 38%. 143 common pool vessels were inactive in 2012 (31% of all common pool permits). This trend continued in FY2013, when 255 (38%) sector vessels were inactive and 130 (29%) common pool vessels were inactive.

In general, from 2010 to 2013, the number of inactive vessels steadily declined, however the proportion of vessels that were inactive remained fairly constant (**Table 45**).

For the remainder of Section 4.6, this report will focus on trends in sector vessels since they are the impacted parties of this action[22]. Totals for the industry as a whole, sectors and common pool combined, will be presented and discussed.

4.6.3 Trends in Landings

Total groundfish landings on trips made by vessels possessing a limited access groundfish permit in 2011 were 62.2 million pounds, which is an increase from 2010 but a decline from a recent high of 72.2 million pounds in 2008. 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 174.1 million pounds in 2010 to 212.2 million pounds in 2011. Total landings of all species made by limited access vessels in the Northeast Multispecies fishery was about 274.6 million pounds in 2011. In 2013, groundfish accounted for only 16.5% of total landings by the groundfish fleet, sectors landed almost 70% of total landings and 98.5% of all groundfish landings.

Generally, from 2011-2013, total landings have decreased and non-groundfish species have become a larger proportion of total landings.

Table 46. Landings by Year (May through April, all trips)

	2010		2011		2012		2013	
Landed Pounds	Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels
Groundfish	58,712,494	57,415,659	62,284,826	61,754,943	47,424,690	47,069,991	42,247,934	41,611,966
Non-Groundfish	174,196,562	97,698,915	212,298,102	127,842,134	213,059,587	131,183,295	214,153,861	137,017,365
Total Pounds	232,909,055	155,114,574	274,582,928	189,597,077	260,484,276	178,253,286	256,401,794	178,629,331

Combined, 142.3 million (live) pounds of ACE were allotted to the sectors in 2013 but only 47.3 million (live) pounds were landed. Of the 16 ACEs allocated to sectors in 2013, 6 stocks approached the catch limit (>80% conversion) set by the total allocated ACE (**Table 47**). This represents a sizeable improvement from 2012 when the fleet caught over 80% of the allocation for only 1 stock. Overall, the fleet landed 33% of the total allocated ACE in 2013. As has been the case in previous years, Georges Bank haddock accounted for a majority of the unrealized landings. Collectively, East and West GB haddock, comprises almost 41% of total allocated ACE, yet only 14% of total catch. In general, total allocations have decreased since 2010 and total catch has never been above 41% of the allocation.

[22] As discussed by Murphy et al. (2013), due to fundamental differences between vessels that opt to join sectors versus those that remain in the common pool, direct comparison of sector and common pool performance measures should not serve alone as a basis for evaluating the success of the catch share management system.

Table 47. Stock level catch, ACE and utilization.

	2010			2011		
	Allocated ACE	Catch	% caught	Allocated ACE*	Catch	% caught
Cod, GB East	717,441	562,610	78%	431,334	357,578	83%
Cod, GB West	6,563,099	5,492,557	84%	9,604,207	6,727,837	70%
Cod, GOM	9,540,389	7,991,172	84%	1,242,220	9,561,153	85%
Haddock, GB East	26,262,695	4,122,910	16%	21,122,565	2,336,964	11%
Haddock, GB West	62,331,182	13,982,173	22%	50,507,974	6,101,400	12%
Haddock, GOM	1,761,206	819,069	47%	1,796,740	1,061,841	59%
Plaice	6,058,149	3,305,950	55%	7,084,289	3,587,356	51%
Pollock	35,666,741	11,842,969	33%	32,350,451	16,297,273	50%
Redfish	14,894,618	4,647,978	31%	17,369,940	5,951,045	34%
White hake	5,522,677	4,687,905	85%	6,708,641	6,598,273	98%
Winter flounder, GB	4,018,496	3,036,352	76%	4,679,039	4,241,177	91%
Winter flounder, GOM	293,736	178,183	61%	750,606	343,152	46%
Winter flounder, SNE	Not allocated			Not allocated		
Witch flounder	1,824,125	1,528,215	84%	2,839,697	2,178,941	77%
Yellowtail flounder, CC/GOM	1,608,084	1,268,961	79%	2,185,802	1,743,168	80%
Yellowtail flounder, GB	1,770,451	1,625,963	92%	2,474,662	2,176,921	88%
Yellowtail flounder, SNE	517,372	340,662	66%	963,033	795,267	83%
Grand Total	**179,350,461**	**65,433,630**	**36%**	**172,111,201**	**70,059,346**	**41%**

*includes sector carryover

Table 45 (continued). Stock level catch, ACE and utilization.

	2012			2013		
	Allocated ACE*	Catch	% caught	Allocated ACE*	Catch	% caught
Cod, GB East	349,326	146,887	42%	199,323	73,389	37%
Cod, GB West	0,320,365	3,331,816	32%	3,752,891	3,316,562	88%
Cod, GOM	8,761,312	4,699,621	54%	1,804,615	1,582,637	88%
Haddock, GB East	5,074,308	777,622	5%	8,249,383	1,276,136	15%
Haddock, GB West	9,398,411	1,808,495	4%	49,856,979	5,225,246	10%
Haddock, GOM	1,784,067	522,917	29%	412,428	368,570	89%
Plaice	7,400,614	3,426,646	46%	3,102,789	3,062,787	99%
Pollock	9,305,283	13,688,091	47%	28,481,182	10,569,073	37%
Redfish	19,052,388	9,096,051	48%	22,454,069	8,782,342	39%
White hake	7,365,297	5,294,489	72%	8,500,901	4,469,611	53%
Winter flounder, GB	7,695,773	4,237,884	55%	7,805,363	3,796,436	49%
Winter flounder, GOM	1,561,490	562,334	36%	1,531,079	367,701	24%
Winter flounder, SNE	Not allocated			2,367,913	1,477,896	62%

Witch flounder	3,291,703	2,122,567	64%	1,333,163	1,398,494	105%
Yellowtail flounder, CC/GOM	2,433,611	2,067,901	85%	1,035,799	823,535	80%
Yellowtail flounder, GB	798,315	474,236	59%	336,532	122,911	37%
Yellowtail flounder, SNE	1,342,708	938,303	70%	1,084,646	621,470	57%
Grand Total	**165,934,970**	**53,195,859**	**32%**	**142,309,054**	**47,334,794**	**33%**

4.6.4 Trends in Revenue

For both sector and common pool vessels, total gross revenues for all species (groundfish and non-groundfish) were at four year lows in 2013. Total all species gross revenue for the entire fleet was $269.9 million, an 8.8% decrease from 2012. Total all species gross revenue fell by $18.7 million (-9.2%) from 2012 to 2013 for vessels enrolled in sectors. Common pool vessels saw total all species gross nominal revenue fall by $7.4 million (-7.9%) (Table 48).

For 2013, declines in total all species revenues for sector vessels were driven primarily by the declines in groundfish revenues, while declines in total all species revenues for common pool vessels were driven by declines in non-groundfish revenues. In 2013, sector vessels had $54.2 million dollars in gross groundfish revenues, the lowest groundfish revenues for sector vessels since the implementation of catch shares in 2010. Groundfish revenues were nearly $13.0 million (19.3%) lower in 2013 than in 2012 for sector vessels, and declining groundfish revenue accounted for 69.6% of the decline in total all species revenue for these vessels. Total non-groundfish revenues also decreased for sector vessels, but this decrease was more modest, with non-groundfish revenues declining by $5.7 million (-4.2%) from 2012 to 2013 (Table 48).

Common pool vessels also experienced a decline in non-groundfish revenue from 2012, but their groundfish revenue was higher in 2013 than it was in 2011 and 2012. Groundfish revenues for common pool vessels were just over $1.0 million in 2013, a 66.4% increase over 2012. Common pool vessels saw their non-groundfish revenue drop to a four year low of $0.85 million in 2013, an 8.4% decline from 2012 (Table 48).

Sector vessels accounted for 68% of all revenue earned by limited access groundfish vessels in 2013. Sector vessels also accounted for 98% of groundfish revenue and 60% of non-groundfish revenue in 2013 (Table 48). It seems apparent that limited access permit holders, specifically sector vessels, were unable to offset declining groundfish revenues with higher non-groundfish revenues.

Table 48. Revenue by Year

	2010		2011		2012		2013	
Gross Revenue	Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels	Total	Se Ves
Groundfish	$83,212,207	$81,165,969	$88,821,349	$87,982,963	$67,815,297	$67,209,195	$55,220,469	$54,2
Non-Groundfish	$210,068,225	$115,537,375	$235,565,188	$141,895,314	$228,136,612	$135,359,399	$214,665,116	$129,6
Total Revenue	$293,280,432	$196,703,344	$324,386,537	$229,878,277	$295,951,909	$202,568,594	$269,885,585	$183,8

4.6.5 Trends in ACE Leasing

Starting with allocations in 2010, each sector was given an initial annual catch entitlement (ACE) determined by the pooled potential sector contribution (PSC) from each vessel joining that sector. 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 the first year of sector management, 282 sector-affiliated vessels had catch that exceeded their individual PSC allocations for at least one stock. These vessels are then assumed to have leased in an additional 22.5 million pounds of ACE and/or PSC with an approximate value of $11.5 million. In 2011 256 Sector-affiliated vessels had catch that exceeded their individual PSC allocations. To account for the additional catch these vessels would have had to lease an additional 30.8 million pounds of quota at an estimated value of $15.1 million, either as PSC from within the sector or as ACE from another sector. Although the number of vessels leasing ACE fell by 9% from 2010 to 2011, the estimated number of pounds leased was 36% greater. In 2012, 241 vessels are assumed to have leased in 23.3 million pounds of ACE and/or PSC at an estimated value of $8.2 million. This represents a 5.9% decrease in the number of vessels that leased quota and a 24.5% decrease in the amount of quota leased from 2011 to 2012 (Murphy et al., 2013).

There were 224 sector-affiliated MRIs with catch that exceeded individual PSC allocations for at least one stock in 2013, down from 242 in FY 2012. These MRIs leased in nearly 21 million pounds of ACE and/or PSC in FY 2013. Of all the major home ports, Gloucester, Massachusetts, had the largest number of lessees with 41 at the vessel level. The largest percentage of the 224 lessees identified (46%) were attached to vessels in the 30’ to <50’ vessel length category. Additionally, while the largest vessel size category (≥75’) was allocated 37% of all ACE in 2013, this size category caught 53% of total catch, indicating a broad shift of ACE/PSC from smaller to larger vessels (Murphy et al., 2014).

4.6.6 Trends in Effort

Some of the proposed benefits of a catch share system of management are the potential efficiency gains associated with increasing operational flexibility. Being released from the former effort controls but being held by ACLs, sector vessels were expected to increase their catch per unit effort by decreasing effort and increasing per-trip yields. Between 2009 and 2010, the total number of groundfish fishing trips and total days absent on groundfish trips declined by 46% and 24% respectively (25,897 trips in 2009 vs. 13,859 trips in 2010; 24,605 days absent in 2009 vs. 18,737 days absent in 2010) (**Table 49**). During the second year of sector management, 2011, the number of groundfish fishing trips and total days absent on groundfish trips increased by 16% and 17% respectively (13,859 trips in 2010 vs. 16,138 trips in 2011; 18,737 days absent in 2010 vs. 21,895 days absent in 2011) (**Table 49**). In 2012, the number of groundfish trips decreased by 11% and total days absent on groundfish trips decreased by 9% from the 2011 peak (16,138 trips in 2011 vs. 14,328 trips in 2012; 21,895 days absent in 2011 vs. 19,839 days absent in 2012). Sector vessels accounted for 90% of all groundfish trips in 2012 and 95% of days absent on groundfish trips (**Table 49**). Average trip length on groundfish trips increased by 43% in 2010 and then remained fairly constant through 2012 (**Table 49**). This implies that with the advent of the sector program, sector fishermen began taking fewer but longer trips to maximize per-trip yields and increase cost efficiency.

The number of non-groundfish trips and days absent on non-groundfish trips did not change substantially in the first year of sector management (+4% for non-groundfish trips; -1% for days absent on non-groundfish trips). Then in 2011, there were significant declines in the number of non-groundfish trips and days absent on non-groundfish trips (12% for non-groundfish trips; 11% for days absent on non-groundfish trips). In 2012, the number of non-groundfish trips continued to decline slightly by 2%, while the number of days absent on non-groundfish trips increased slightly by 4% (Table 49).

The numbers of groundfish trips taken were at four year lows in 2013 for both sector and common pool vessels. For sector vessels, the number of groundfish trips taken fell by 3,865 trips (-29.8%) from 2012 to 2013. Common pool vessels took 427 (-31.9%) fewer groundfish trips. The total numbers of days absent on groundfish trips also decreased to their lowest levels in 2013 for both sector and common pool vessels.

Sector vessels had 2,642 fewer days absent (-13.9%) on groundfish trips in 2013 than in 2012, while total days absent on groundfish trips for common pool vessels fell by 185 days absent (-22.0%) (Table 49).

Non-groundfish effort increased for sector vessels in 2013. Sector vessels took 4.2% more non-groundfish trips (+728 trips) than in 2012, reaching a four year high. Total days absent on non-groundfish trips also increased to a four year high for sector vessels, with 575 more days absent in 2013 than in 2012, a 3.5% increase. In contrast, effort measures for non-groundfish decreased slightly for common pool vessels in 2013 compared to 2012; common pool vessels took 435 fewer non-groundfish trips (-2.7%), with 288 fewer days absent on non-groundfish trips (-2.2%) (Table 49).

Table 49. Effort by Active Vessels

	2009	2010		2011		2012		2013	
		Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels
Number of Groundfish Trips	25,897	13,859	11,575	16,138	13,858	14,328	12,990	10,056	9,145
Number of non-groundfish Trips	37,173	38,507	16,547	33,727	16,814	33,024	17,172	33,317	17,900
Number of days absent on groundfish trips	24,605	18,737	17,131	21,895	20,393	19,839	18,997	17,013	16,356
Number of days absent on non-groundfish trips	31,606	31,354	16,022	28,032	15,486	29,151	16,340	29,439	16,916
Average trip length on groundfish trips (standard deviation)	0.96 (1.74)	1.35 (2.13)	1.48 (2.28)	1.36 (2.19)	1.47 (2.33)	1.39 (2.20)	1.46 (2.28)	1.69 (2.40)	1.79 (2.49)
Average trip length on non-groundfish trips (standard deviation)	0.92 (1.66)	0.86 (1.56)	1.01 (1.73)	0.86 (1.52)	0.97 (1.67)	0.91 (1.60)	0.97 (1.67)	0.90 (1.56)	0.96 (1.61)

4.6.7 Trends in Fleet Characteristics

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. For this analysis, the groundfish fleet has been divided into four "vessel size categories," vessels less than 30 feet in length, vessels between 30 and 50 feet in length, vessels between 50 and 75 feet in length and vessels greater than 75 feet in length. As discussed earlier, the total number of active vessels steadily declined between 2009 and 2013. The number of vessels smaller than 30' experienced the largest percentage decline (30%) between 2009 and 2013 (73 to 51 vessels). The 30' to < 50' vessel size category, which has the largest number of active vessels, experienced a 20% decline (478 to 384 active vessels) during the past 5 years. The majority of sector vessels fell into this 30' to <50' size category. The 50' to < 75' vessel size category, containing the second largest number of vessels, experienced a 18% reduction from 2009 to 2013 (236 to 193 active vessels). The 50' to < 75' size category also had the second largest number of sector vessels throughout the time period. The number of active vessels in the largest (75' and above) vessel size category declined by 17% between 2009 and 2013. For vessels less than 30' most decreases in active vessels occurred between 2009 and 2011. For all other vessel size categories declines occurred steadily from 2009 to 2013 (**Table 50**).

For active vessels with at least one groundfish trip, patterns of decline were similar to those for all active vessels. The main difference however was a much steeper drop from 2009 to 2010, when decreases ranged from 15% in the 75' and above category to 29% in the less than 30' category. During 2010 to 2012, there was little change in the number of sector vessels with at least one groundfish trip. However from 2012 to 2013, decreases occurred again, ranging from 23% for vessels 30' to <50' and 14% for the 50' to <75' category (**Table 50**).

The proportion of sector vessels within each vessel size category was increasing in relation to vessel size for the years 2010 to 2013. For the less than 30' category, sector vessels comprised between 7% and 15% of all active vessels. For the 30' to <50' category sector vessels accounted for between 50% and 57% of all active vessels and for the 50' to <75' category, sector vessels accounted for 60% to 65% of all active vessels. Finally, for the 75' and above category, sector vessels accounted for 67% to 70% of all active vessels from 2010 to 2013. The proportion of sector vessels within each vessel size category for vessels with at least one groundfish trip was also increasing in relation to vessel size for the years 2010 to 2013 and was generally higher in magnitude than it was for all active vessels. For the less than 30' category, sector vessels comprised between 5% and 7% of all active vessels with at least one groundfish trip. For the 30' to <50' category and the 50' to <75' category, sector vessels accounted for 61% to 72% and 78% to 83% of all vessels with at least one groundfish trip respectively. Finally, for the 75' and above category, sector vessels accounted for 92% to 95% of all active vessels with at least one groundfish trip during the time period of 2010 to 2013 (**Table 50**).

Table 50. Active vessels by size class

		2010		2011		2012		2013	
Vessel Size	**2009**	**Total**	**Sectors**	**Total**	**Sectors**	**Total**	**Sectors**	**Total**	**Sectors**
Vessels with revenue from any species									
Less than 30'	73	65	5	51	5	49	7	51	7
30' to < 50'	478	459	230	403	230	398	229	384	212
50' to < 75'	236	218	132	212	132	205	133	193	125
75' and above	129	113	76	111	76	111	76	107	75
Total	916	855	443	777	443	763	445	735	419
Vessels with at least one groundfish trip									
Less than 30'	34	24	1	20	1	16	1	17	1
30' to < 50'	305	242	150	218	150	207	150	159	115
50' to < 75'	157	121	95	119	95	117	97	102	83
75' and above	70	59	56	61	56	60	55	49	46
Total	566	446	302	418	302	400	303	327	245

Fishing effort, as described by either the number of trips taken or the total number of days absent, varies considerably by vessel size. In 2012 more than two thirds of groundfish trips were made by vessels ranging in size from 30 to 50 feet in total length. From 2009 to 2010, the number of groundfish trips and days absent on those trips dropped significantly across all vessel size categories, except for the 75' and above category which saw minimal declines. In 2011, these values increased for almost all vessel size categories, but then dropped again in 2012 and in 2013. Effort on groundfish trips generally decreased in 2013. The fleet is taking fewer groundfish trips, with fewer total days absent on these trips. However, when a groundfish trip is taken, most vessels are taking lengthier trips than in prior years. Both the number of groundfish trips taken and total days absent on groundfish trips were at four year lows in 2013, across all vessel length classes. However, for the groundfish trips taken, average trip length for all vessels was slightly longer in 2013 than it was in 2012.

Overall from 2010-2013, the largest percentage decline in the number of groundfish trips and days absent on groundfish trips occurred in the less than 30' category (25% and 33% respectively). However, there were relatively few trips per year in this vessel size category. In terms of magnitude, the 30' to < 50' vessel size category had the greatest decrease in groundfish trips and days absent (3,331 fewer groundfish trips and 711 fewer days absent on groundfish trips from 2010 to 2013). The 50’ to < 75’ vessel size category had a slight decrease of about 7% in groundfish trips and a 8% decrease in days absent on groundfish trips. The largest vessel class (75’ and above) experienced a reduction of 20% in groundfish trips and 7% in days absent on groundfish trips from 2010 to 2013 (**Table 51**).

Table 51. Vessel effort (as measured by number of trips and days absent) by vessel size category

	2010		2011		2012		2013	
Less than 30'	**Total**	**Sectors**	**Total**	**Sectors**	**Total**	**Sectors**	**Total**	**Sectors**
Number of Groundfish Trips	136	2	275	15	187	6	102	8
Number of non-groundfish Trips	1,465	315	1,161	199	1,105	192	1,243	242
Number of days absent on groundfish trips	61	0.8	102	7	70	2.9	41	3.8
Number of days absent on non-groundfish trips	470	107	376	68	335	61	409	82
Average trip length on groundfish trips * (standard deviation)	0.45 (0.13)	0.40 (0.88)	0.37 (0.12)	0.47 (0.10)	0.38 (0.13)	0.48 (0.10)	0.40 (0.19)	0.48 (0.09)
Average trip length on non-groundfish trips * (standard deviation)	0.33 (0.14)	0.35 (0.91)	0.33 (0.11)	0.35 (0.10)	0.32 (0.11)	0.32 (0.10)	0.34 (0.37)	0.36 (0.14)
30' to <50'								
Number of Groundfish Trips	9,593	7,829	11,343	9,639	9,888	8,879	6,262	5,694
Number of non-groundfish Trips	23,726	9,454	20,476	10,368	20,681	11,079	21,337	11,481
Number of days absent on groundfish trips	5,484	4,313	6,724	5,613	6,046	5,395	4,773	4,345
Number of days absent on non-groundfish trips	9,361	3,770	8,187	3,865	8,511	4,403	8,865	4,526
Average trip length on groundfish trips * (standard deviation)	0.57 (0.66)	0.55 (0.64)	0.59 (0.71)	0.58 (0.72)	0.61 (0.75)	0.61 (0.75)	0.76 (0.91)	0.76 (0.93)
Average trip length on non-groundfish trips * (standard deviation)	0.43 (0.36)	0.43 (0.34)	0.42 (0.36)	0.41 (0.29)	0.43 (0.32)	0.41 (0.26)	0.43 (0.33)	0.40 (0.24)

Table 49 (continued). Effort by active vessels (May through April).

	2010		2011		2012		2013	
50' to <75'	**Total**	**Sectors**	**Total**	**Sectors**	**Total**	**Sectors**	**Total**	**Sectors**
Number of Groundfish Trips	2,909	2,554	3,328	3,026	3,179	3,037	2,712	2,466
Number of non-groundfish Trips	11,074	5,559	9,938	5,071	9,105	4,736	8,757	4,990
Number of days absent on groundfish trips	6,456	6,124	7,581	7,310	6,858	6,751	5,946	5,766
Number of days absent on non-groundfish trips	12,888	7,246	11,807	7,121	12,293	7,431	12,511	7,994
Average trip length on groundfish trips *	2.23	2.41	2.28	2.42	2.16	2.22	2.19	2.34
(standard deviation)	(2.55)	2.66	(2.63)	(2.71)	(2.52)	(2.55)	(2.61)	(2.69)
Average trip length on non-groundfish trips *	1.18	1.32	1.20	1.42	1.36	1.57	1.44	1.61
(standard deviation)	(1.68)	(1.73)	(1.71)	(1.87)	(1.89)	(2.00)	(1.92)	(1.99)
75' and above								
Number of Groundfish Trips	1,221	1,190	1,192	1,178	1,074	1,068	980	977
Number of non-groundfish Trips	2,242	1,219	2,152	1,176	2,133	1,165	1,980	1,187
Number of days absent on groundfish trips	6,736	6,693	7,489	7,463	6,866	6,849	6,253	6,241
Number of days absent on non-groundfish trips	8,636	4,900	7,663	4,431	8,013	4,446	7,655	4,314
Average trip length on groundfish trips *	5.53	5.63	6.29	6.34	6.40	6.42	6.38	6.39
(standard deviation)	(2.89)	(2.82)	(2.91)	(2.88)	(2.84)	(2.83)	(2.57)	(2.57)
Average trip length on non-groundfish trips *	3.94	4.12	3.60	3.79	3.79	3.84	3.91	3.67
(standard deviation)	(3.58)	(3.52)	(3.26)	(3.30)	(3.35)	(3.31)	(3.14)	(3.09)

Table 49 (continued). Effort by active vessels (May through April).

All Vessels	2010 Total	2010 Sectors	2011 Total	2011 Sectors	2012 Total	2012 Sectors	2013 Total	2013 Sectors
Number of Groundfish Trips	13,859	11,575	16,138	13,858	14,328	12,990	10,056	9,145
Number of non-groundfish Trips	38,507	16,547	33,727	16814	33,024	17,172	33,317	17,900
Number of days absent on groundfish trips	18,737	17,131	21,895	20,393	19,839	18,997	17,013	16,356
Number of days absent on non-groundfish trips	31,354	16,022	28,032	15,486	29,151	16,340	29,439	16,916
Average trip length on groundfish trips * (standard deviation)	1.35 (2.13)	1.48 (2.28)	1.36 (2.19)	1.47 (2.33)	1.39 (2.20)	1.46 (2.28)	1.69 (2.40)	1.79 (2.49)
Average trip length on non-groundfish trips * (standard deviation)	0.86 (1.56)	1.01 (1.73)	0.86 (1.52)	0.97 (1.67)	0.91 (1.60)	0.97 (1.67)	0.90 (1.56)	0.96 (1.61)

***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.

4.6.8 Fishing Communities

There are over 100 communities that are homeport to one or more Northeast groundfish vessels. These ports occur throughout the coastal northeast and mid-Atlantic. Consideration of the social impacts on these communities from proposed fishery regulations is required as part of the National Environmental Policy Act (NEPA) of 1969 and the Magnuson Stevens Fishery Conservation and Management Act, 1976. 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. In recent amendments to the fishery management plan the council has categorized communities dependent on the groundfish resource into primary and secondary port groups so that community data can be cross-referenced with other demographic information. Further descriptions of Northeast fishing communities in general can be found on Northeast Fisheries Science Center's website (http://www.nefsc.noaa.gov/read/socialsci/community_profiles/).

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 small ports and communities that may only have a small number of vessels because such information could easily be attributed to a particular vessel or individual.

4.6.8.1 Vessel Activity

From 2012 to 2013, most homeport states in the Northeast Region experienced declines in the number of vessels with revenue from any species, with the numbers of active vessels at 4 year lows for Maine, New Hampshire, Massachusetts, and New York. At the state level, Massachusetts has the highest number of active vessels with a limited access groundfish permit. All states have shown a decline in the number of active vessels since 2009, but the largest percentage declines occurred in New Hampshire and New Jersey, where the number of active vessels dropped 28% and 23% respectively for both by 2013 (**Table 52**). In 2013, 56% of the active vessels belonging to a sector had a homeport in Massachusetts (235 vessels), while New Jersey and Connecticut are the two states in the Northeast that had the fewest vessels belonging to a sector (**Table 52**).

Five of the six major homeports in the region lost active vessels from 2012 to 2013, with Gloucester, New Bedford and Chatham at four year lows. All major homeports in the Northeast except Portland, Maine, saw decreases in the number of active vessels from 2009 to 2013. These declines ranged from 6% in Point Judith to 26% in Boston. Gloucester had the highest number of active sector vessels in 2013 (**Table 52**).

Table 52. Number of Active Vessels with Revenue from any Species (all trips) by Home Port and State

Home Port State/City		Fishing Year 2009	2010 Total	2010 Sector Vessels	2011 Total	2011 Sector Vessels	2012 Total	2012 Sector Vessels	2013 Total	2013 Sector Vessels
CT		12	11	4	11	4	10	5	10	4
MA		459	423	263	378	259	371	251	355	235
	BOSTON	62	52	41	45	37	47	37	46	35
	CHATHAM	42	43	31	38	27	38	29	35	26
	GLOUCESTER	110	107	71	92	66	88	66	83	60
	NEW BEDFORD	86	69	48	69	52	69	51	66	50
ME		112	101	62	88	70	95	76	87	68
	PORTLAND	17	16	14	16	15	18	16	17	15
NH		53	50	35	45	33	41	29	38	26
NJ		61	56	2	48	4	46	9	47	10
NY		95	93	15	91	16	87	19	82	20
RI		93	86	43	82	44	77	42	78	42
	POINT JUDITH	48	45	33	44	34	44	35	45	34
OTHER NORTHEAST		34	34	13	34	13	36	15	38	14
Grand Total*		916	855	435	777	442	763	446	735	419

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

Massachusetts is also the state with the highest number of active vessels with revenue from at least one groundfish trip. While all states showed a decline in the number of vessels making groundfish trips, the largest percentage decline (61%: 26 to 10 vessels) occurred in New Jersey (**Table 53**). Of the sector vessels making groundfish trips in 2013, 59% have a homeport in Massachusetts (146 vessels). Again, New Jersey and Connecticut are the two states with the fewest sector vessels making groundfish trips in 2013.

In 2013, all six major home ports in the Northeast region saw declines from 2012 in the number of vessels with revenue from a groundfish trip, with Boston, Chatham, Gloucester and New Bedford at four year lows. Most major homeports in the Northeast saw decreases in the number of active vessels with at least one groundfish trip from 2009 to 2013. These declines ranged from 6% in Portland to 45% in Boston and Gloucester. Gloucester had the highest number of active sector vessels with at least one groundfish trip in 2012 (**Table 53**).

Table 53. Number of Vessels with Revenue from at Least One Groundfish Trip by Home Port and State

Home Port State/City		Fishing Year								
			2010		2011		2012		2013	
		2009	Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels	Total	Sector Vessels
CT		8	7	3	5	2	5	3	5	3
MA		310	238	190	222	185	206	179	172	146
	BOSTON	46	35	33	30	30	28	28	25	24
	CHATHAM	28	26	23	25	22	23	21	20	17
	GLOUCESTER	97	75	60	69	55	61	54	53	46
	NEW BEDFORD	51	33	29	37	32	36	32	31	28
ME		64	42	37	48	45	51	48	39	34
	PORTLAND	15	14	13	15	15	16	16	14	14
NH		40	32	26	28	23	25	20	25	18
NJ		26	21	1	17	1	10	2	10	2
NY		47	40	8	42	9	42	12	29	8
RI		61	55	34	48	32	54	37	44	44
	POINT JUDITH	33	31	28	28	27	33	31	30	27
OTHER NORTHEAST		12	12	5	7	5	7	2	3	1
Grand Total*		566	446	303	418	301	400	303	327	245

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

4.6.8.2 Employment

Along with the restrictions associated with presenting confidential information there are 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 (Olson and Clay 2001, Thunberg 2007, Thunberg 2008, NMFS 2010, and Clay et al. 2008).

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

In general, trends in crew employment indicators were negative, suggesting that in 2013 there were fewer opportunities for crew work on most vessel sizes and in many of the region's home port states. For the fleet as whole, total crew positions, total crew trips, and total crew days were at four year lows in 2013. In 2013 vessels with limited access groundfish permits provided 2,046 crew positions, with about half (987) coming from vessels with home ports in Massachusetts. From 2010 to 2013, the total number of crew positions provided by limited access groundfish vessels declined by 11% (2,275 positions to 2,046). All home port states except Connecticut and New Jersey had fewer crew positions in 2013 than 2010.

Vessels with a home port in New Hampshire and Massachusetts experienced the largest percentage decline from 2010 to 2013 (26% in NH; 16% in MA) (**Table 54**).

Table 54. Number of Crew Positions and Crew-Days on Active Vessels by Home Port and State

Home Port State		Year			
		2010	2011	2012	2013
CT					
	Total CREW POSITIONS	37	42	39	39
	Total CREW-TRIPS	1,991	1,470	1,550	1,294
	Total CREW-DAYS	4,020	3,002	4,478	3,551
	Crew-days/Crew-trips	2.02	2.04	2.89	2.74
MA					
	Total CREW POSITIONS	1,140	1,071	1,050	987
	Total CREW-TRIPS	54,204	54,516	51,690	44,353
	Total CREW-DAYS	83,235	85,747	81,696	73,518
	Crew-days/Crew-trips	1.54	1.57	1.58	1.66
ME					
	Total CREW POSITIONS	244	222	242	228
	Total CREW-TRIPS	16,592	14,073	14,374	13,088
	Total CREW-DAYS	15,596	14,910	16,524	15,237
	Crew-days/Crew-trips	0.94	1.06	1.15	1.16
NH					
	Total CREW POSITIONS	108	106	95	86
	Total CREW-TRIPS	8,159	8,507	8,067	5,937
	Total CREW-DAYS	3,929	4,987	5,166	4,487
	Crew-days/Crew-trips	0.48	0.59	0.64	0.76

Table 52 (continued). Changes in employment indicators by home port state (May through April, all trips)

Home Port State		Year			
		2010	2011	2012	2013
NJ					
	Total CREW POSITIONS	150	144	149	153
	Total CREW-TRIPS	9,956	9,556	8,133	7,682
	Total CREW-DAYS	10,093	9,893	10,349	9,564
	Crew-days/Crew-trips	1.01	1.04	1.27	1.25
NY					
	Total CREW POSITIONS	208	217	208	191
	Total CREW-TRIPS	14,663	14,932	14,150	13,107
	Total CREW-DAYS	15,763	16,046	15,028	14,372
	Crew-days/Crew-trips	1.08	1.07	1.06	1.10
RI					
	Total CREW POSITIONS	256	247	232	226
	Total CREW-TRIPS	15,152	15,417	14,988	16,977
	Total CREW-DAYS	26,822	25,147	24,247	25,645
	Crew-days/Crew-trips	1.77	1.63	1.62	1.51
OTHER NORTHEAST					
	Total CREW POSITIONS	131	129	131	136
	Total CREW-TRIPS	4,316	4,314	4,166	4,263
	Total CREW-DAYS	11,818	11,610	11,640	11,227
	Crew-days/Crew-trips	2.74	2.69	2.79	2.63
Total*					
	Total CREW POSITIONS	2,275	2,179	2,145	2,046
	Total CREW-TRIPS	125,032	122,785	117,118	106,699
	Total CREW-DAYS	171,277	171,343	169,128	157,601
	Crew-days/Crew-trips	1.37	1.40	1.44	1.48

*Note: Vessels may change home ports during the year resulting in associated crew positions for more than one state. This means the total positions shown here are higher than the total positions as calculated at the permit level. The total work opportunity associated with these positions, crew trips and crew-days totals, is the same as reported at the permit level.

A crew day is another measure of employment opportunity that incorporates information about the time spent at sea earning a share of the revenue. Similar to a "man-hour," this measure is calculated by multiplying a vessel's crew size by the days absent from port, and since the number of trips affects the crew-days indicator, the indicator is also a measure of work opportunity. 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 2013 vessels with limited access groundfish permits used 157,601 crew days with close to half (73,518) coming from vessels with home ports in Massachusetts. Since 2010 the total number of crew days used by limited access groundfish vessels has declined by 9% (171,277 to 157,601 crew days). Declines in crew days occurred across most home port states from 2010 to 2013, except New Hampshire. From 2010 to 2013, Massachusetts and Connecticut had the largest decline in total crew days at 13% (**Table 54**).

The number of crew positions and crew days give some indication of the direct benefit to communities from the multispecies fishery through employment opportunities. These measures however, by themselves, do not show changes in crew income levels nor do they 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 a key component of community continuity as fishing represents an important occupation in many of the smaller port areas.

4.6.8.3 Consolidation and Redirection

The multiple regulatory constraints placed on common pool groundfishermen 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 in previous years, 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 United States (U.S.) 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 and 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 and Edwards 2009).

It is apparent from the data presented in section 4.6 of this document that consolidation of landings and revenues onto fewer vessels is occurring. The data also implies that the number of active vessels in the smaller size categories (less than 30' and 30' to <50') have been decreasing at faster rates than the larger size categories (50' to <75' and 75' and above). The data also suggests that vessels in the smallest size categories tend to be net lessors of quota. What is difficult to ascertain is the extent to which permits/permit holders themselves have consolidated. Many fishermen own multiple vessels and may transfer quota from one to another. Permits can also be disassociated from physical vessels and entered into Confirmation of Permit History (CPH) where they are no longer tracked in the permit database. Inactive permits in CPH can still lease PSC to active vessels and therefore may continue to generate net benefits even though it looks like they have disappeared from the industry.

The scope of consolidation and redirection of effort that may be expected to result from sector operations in FY 2015 is difficult to predict. Data are now available for the first four years of expanded sector operations, FY 2010, FY 2011, FY2012 and FY2013 which were discussed above.

4.6.8.4 Overview of the Ports for FY 2014 Sectors

Sector fishermen would utilize ports throughout the Middle Atlantic and New England. The sector operations plans listed home ports and landing ports that the sectors plan to use in FY 2014. Table 1 summarizes these ports.

Please refer to the Community Profiles for Northeast US Fisheries (NEFSC 2009) (http://www.nefsc.noaa.gov/read/socialsci/community_profiles) for descriptions of these ports. Appendix B of the FY 2013 Sector Operations EA also contains a description of many of these primary ports.

4.6.9 Overview of the American Lobster Fishery

Today, the commercial sector of the American lobster fishery and the communities involved in that fishery can be seen as the product of resource fluctuation, current social and economic conditions, and changes in management. These conditions impact not only the lobster fishery but other fisheries in the region as well. The numbers of fishermen entering or leaving the lobster fishery are often linked to the relative conditions of other fisheries. Because the changes considered in the current sector operation plans could have an effect on the lobster fishery and its communities, an overview of the lobster fishery is included below.

The commercial lobster fishery is described as having started in the 1840s, concurrent with the development of the re-circulating seawater tank which allowed for an increased distribution of caught lobster (Acheson, 2010). Early in the fishery's history effort was managed by individual states with little interstate uniformity. It wasn't until 1972 that states along the Atlantic coast began cooperative management of the lobster resource under a NMFS State-Federal Partnership Program. As part of this partnership program, the Northeast Marine Fisheries Board (NMFB) was formed to help research and expand management of the American lobster. Following implementation of the 1976 Fisheries Conservation and Management Act (FCMA), the NMFB developed a comprehensive management plan which was submitted to the newly created New England Fishery Management Council in 1978. This management plan would act as a precursor to the NEFMC's American Lobster Fishery Management Plan (ALFMP) that was eventually adopted in 1983. From 1983 to 1994 the lobster fishery was primarily managed through a standardized gear requirement, a minimum landed size and a prohibition on landing 'berried' females[23]. The first real step in limiting effort in the fishery was not taken until 1994 when Amendment 5 to the FMP included a permit moratorium that restricted entry (Acheson, 1997).

Concurrent with the Federal management of the lobster fishery was the implementation of an Interstate Fishery Management Plan (ISFMP) developed by the ASMFC in 1978. The original plan's primary

[23] "Berried" refers to a female lobster with fertilized eggs.

purpose was to establish regulatory uniformity across state and federal jurisdictions, but by 1995, it was becoming clear that maintaining separate management authority by the Atlantic States Marine Fisheries Commission (ASMFC) and its member states under the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) and the NMFS under the FCMA was not accomplishing a unified approach to lobster management. Federal authority over the lobster fishery was eventually transferred to the ASMFC in 1999, by which point seven different lobster conservation areas had been identified (Acheson, 2004). Currently each Lobster Conservation Management Area (LCMA) has its own effort reduction needs which are developed by the respective management team. Amendment 3 to the ISFMP set default trap limits for four of the management areas and Addendum 1 set trap limits for the remaining three.

In 1976 there were an estimated 10,356 vessels participating in the inshore trap fishery and 117 vessels participating in the offshore lobster fishery (Acheson, 1997). Since Amendment 3 and the transfer of federal authority to the ASMFC in 1999, vessel operators have had to apply for an area specific trap permit to fish in one of the seven LCMAs. These permits are not mutually exclusive and owners may apply for any permit for an area that they wish to fish. There are also specific permit categories for non-trap and charter/party fishing as well. Typically the area specific trap permits are used by the directed trap fishery while the non-trap permits are used by the much smaller offshore mobile gear fishery or so that vessels using non-trap gear may land incidentally caught lobsters.

The total number of vessels with any type of lobster permit declined gradually over the last ten years by 16% overall. The states of Maine and Massachusetts have been and are home to the most vessels with a lobster permit, and combined they account for approximately three quarters of permitted vessels (**Table 55**). There are some notable differences between the various homeport states with regard to the type of permits vessels have. Over the last ten years, 96% - 97% of vessels with a homeport in Maine have had an area specific trap permit as opposed to only 6% - 8% having the non-trap permit. Vessels with homeports in other states have historically had a much larger proportion of non-trap permits than Maine. For example, in 2013, 421 out of 807 (52%) vessels with a home port in Massachusetts have a non-trap permit while 490 (61%) have an area specific trap permit (**Table 55**).

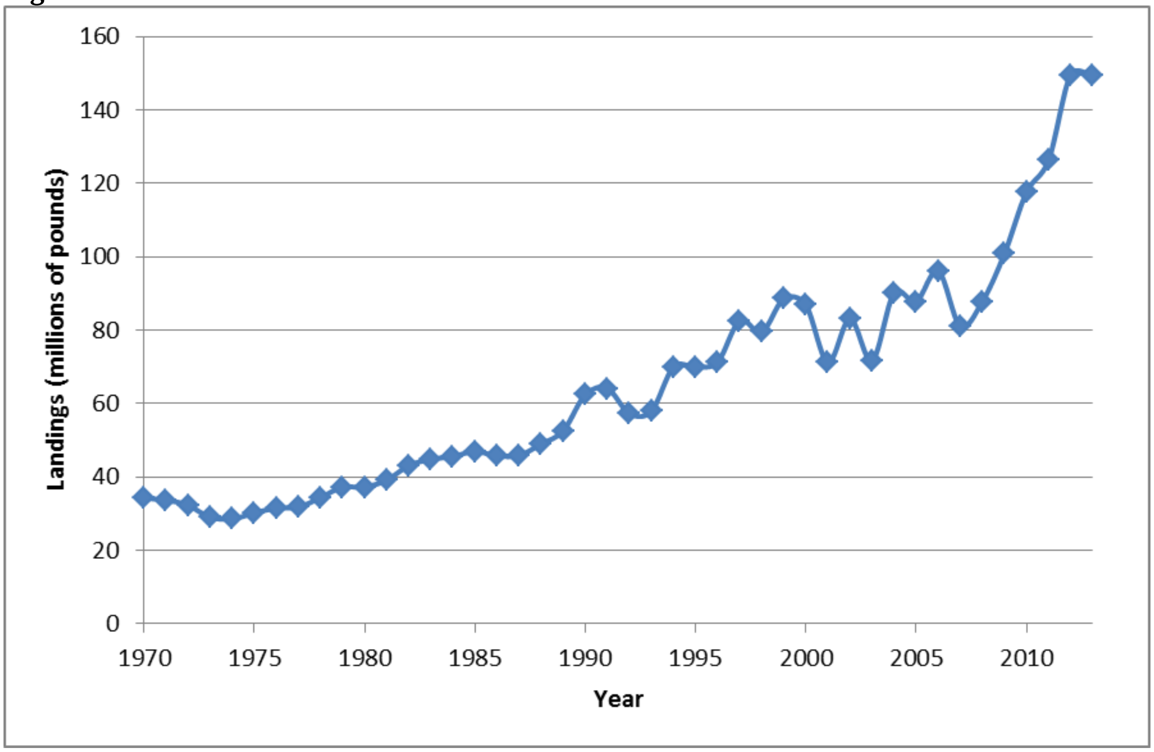
Table 55. Numbers of vessels by homeport state, lobster permit type and year

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	3357	3353	3394	3288	3215	3176	3139	3116	3003	2835
CT										
Any LO Permit	32	30	31	29	29	30	27	26	28	27
Non-trap	21	21	21	20	21	20	19	19	18	17
Charter	2	2	2	2	2	2	3	4	4	4
Any area trap	24	21	22	22	21	22	21	21	23	23
MA										
Any LO Permit	1113	1055	1027	1011	987	974	951	910	867	807
Non-trap	500	500	499	508	516	517	504	483	439	421
Charter	8	7	6	7	8	8	7	6	6	6
Any area trap	800	743	711	687	659	635	619	591	569	490
ME										
Any LO Permit	1408	1461	1527	1459	1420	1424	1425	1451	1408	1350
Non-trap	102	114	117	119	108	103	93	93	86	87
Charter	2	2	1	1						
Any area trap	1370	1409	1471	1401	1370	1377	1384	1412	1370	1302
NH										
Any LO Permit	113	117	117	112	116	111	110	111	105	96
Non-trap	57	56	60	62	61	57	59	53	46	43
Charter	2	2	2	2	2	2	2	2	2	2
Any area trap	87	88	85	82	85	83	82	84	85	68
NJ										
Any LO Permit	181	182	192	187	199	189	191	193	187	177
Non-trap	120	126	137	133	143	135	137	140	134	127
Charter	13	12	11	11	11	11	11	11	11	10
Any area trap	83	84	83	81	89	87	86	83	86	80
NY										
Any LO Permit	139	135	136	134	123	123	117	120	109	97
Non-trap	92	85	85	85	81	80	76	77	74	67
Charter	7	7	6	5	5	5	3	1	2	1
Any area trap	82	85	87	84	73	74	71	72	64	54
RI										
Any LO Permit	250	240	236	232	226	218	214	208	202	184
Non-trap	87	90	90	89	89	85	81	75	71	69
Charter	1	1	1	2	2	2	2	2	2	2
Any area trap	209	200	197	190	182	177	176	172	169	149

*These numbers are based on the first permit application of each year for each vessel and do not account for vessels that changed homeport states or permit types during the year.

Although the fishery has existed for almost two centuries, consistent and reliable landing statistics are not available prior to 1950. From about 1957 through 1974, landings from the lobster fishery remained relatively constant at an average of about 30 million pounds per year. Landings of lobster steadily increased from 29 million pounds in 1974 to 64 million pounds in 1991 before declining to 57 million pounds in 1992 (Figure 16). Landings then continued to rise to 89 million pounds in 1999, after which lobster landings would oscillate almost year to year by nearly 15 million pounds from 2000 to 2007. In the most recent years lobster landings have experienced an unprecedented high exceeding 100 million pounds since 2009, and nearly reaching 150 million pounds in 2012 and 2013.

Figure 16



*Source: NOAA Fisheries Office of Science and Technology
(http://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index)

Maine has always been the leading producer of lobsters, but its share of total landings has fluctuated over time. Throughout the 1970s Maine accounted for between 50% and 60% of total lobsters landed from Maine to New Jersey (**Table 56**). Expansion of lobster landings during the 1980s, particularly in Massachusetts, reduced the share of lobster Maine supplies to 50% or less until the mid-1990s. However, since 2000 the contribution of the Maine lobster fishery to total landings increased gradually to just over 85% of the domestic harvest in 2013. The increasing proportion of Maine landings is due to a combination of increased landings in Maine and declining landings in just about every other state.

Table 56. Annual share or 5-year average annual share of lobster landings by state, 1970–2012

Year(s)	CT	ME	MA	NH	NJ	NY	RI
1970-1974	1.9%	54.2%	19.5%	1.9%	4.5%	3.9%	12.8%
1975-1979	2.0%	58.0%	24.0%	1.6%	2.4%	1.9%	9.5%
1980-1984	3.2%	51.9%	29.3%	2.5%	1.7%	2.5%	8.5%
1985-1989	3.8%	43.6%	32.4%	2.5%	3.0%	3.3%	11.1%
1990-1994	3.9%	49.6%	25.6%	2.7%	2.1%	5.1%	11.0%
1995-1999	3.9%	56.4%	19.1%	1.9%	1.0%	10.0%	7.7%
2000	1.6%	65.9%	18.2%	2.0%	1.0%	3.3%	8.0%
2001	1.9%	68.3%	17.0%	2.8%	0.8%	2.9%	6.3%
2002	1.3%	76.6%	15.5%	0.0%	0.3%	1.7%	4.6%
2003	0.9%	76.7%	15.9%	0.0%	0.3%	1.3%	4.8%
2004	0.7%	79.5%	12.5%	2.3%	0.4%	1.1%	3.4%
2005	0.8%	78.3%	11.3%	2.9%	0.4%	1.3%	4.9%
2006	0.8%	78.4%	12.6%	2.5%	0.5%	1.3%	3.9%
2007	0.7%	78.9%	12.5%	3.0%	0.8%	1.1%	2.8%
2008	0.5%	79.6%	12.1%	2.9%	0.7%	1.0%	3.2%
2009	0.4%	80.6%	11.7%	3.0%	0.6%	0.9%	2.8%
2010	0.4%	81.9%	10.9%	3.1%	0.6%	0.7%	2.5%
2011	0.1%	83.1%	10.6%	3.1%	0.5%	0.3%	2.2%
2012	0.2%	84.7%	9.7%	2.8%	0.6%	0.2%	1.8%
2013	0.1%	85.3%	10.2%	2.6%	0.4%	na	1.4%

From 1970 up to the present, the American lobster fishery has been either the most or second most valuable fishery in the Northeast region. Nominal dockside revenue from American lobster has increased steadily from $33 million in 1970 to $314 million in 2000. Since 2000, revenues from lobster have fluctuated but most recently they have exceeded $400 million in 2010 through 2013 (**Table 57**). As with landings, Maine has consistently had the highest revenues from lobster of any Northeast state. In 2013, Maine accounted for 80% of total lobster revenue (**Table 57**).

Table 57. Lobster revenue (in thousands of dollars) by state and year 2000-2012*

	CT	MA	ME	NH	NJ	NY	RI	Total
2000	$5,501	$70,116	$187,715	$7,081	$3,694	$11,555	$28,103	$314,058
2001	$5,450	$53,430	$153,982	$8,072	$2,471	$7,357	$18,747	$249,798
2002	$4,226	$56,569	$210,950	$8,164	$1,139	$5,131	$15,875	$302,186
2003	$3,170	$52,329	$205,715	$8,556	$1,028	$4,426	$16,731	$292,146
2004	$3,166	$51,643	$289,079	$925	$1,800	$3,722	$14,593	$365,186
2005	$3,821	$48,793	$317,948	$14,377	$1,999	$4,396	$23,010	$414,677
2006	$4,031	$52,593	$296,855	$13,915	$2,533	$6,289	$18,408	$394,918
2007	$3,222	$51,268	$280,645	$16,410	$4,055	$5,288	$17,237	$378,456
2008	$2,106	$45,426	$245,186	$12,268	$3,215	$5,498	$12,994	$326,962
2009	$1,914	$42,557	$237,379	$11,919	$1,146	$3,932	$11,201	$310,290
2010	$3,169	$50,261	$318,234	$14,835	$2,910	$4,485	$12,400	$406,500
2011	$816	$53,305	$335,005	$16,346	$3,086	$2,533	$12,728	$424,089
2012	$1,751	$53,230	$341,670	$17,145	$3,937	$2,045	$12,031	$432,167
2013	$714	$61,660	$368,293	$16,649	$2,796	$1,059	$9,762	$460,937

*These values come from the NEFSC's Commercial Fisheries Database System (CFDBS).

With respect to the influence of events occurring in other fisheries on the lobster fishery; prior to 1994 most fisheries in the Northeast region had been open access. The relative ease with which one could move between fisheries allowed vessel owners and operators participating in the lobster fishery to pursue other fisheries without having to qualify for any specific permit. At the same time, landings in the lobster fishery were increasing rapidly during the 1980s and early 1990s, drawing in additional effort that had previously been engaged in other fisheries. Once limited entry was introduced in the groundfish and scallop fisheries in 1994, many part-time lobster participants were excluded from those permit allocations as they failed to have the necessary landings to qualify. Others qualified for limited access permits but were not allocated any days-at-sea. This contraction of the fishing industry has in turn increased dependence on lobster fishing for many fishermen, especially in Maine (Thunberg, 2007). For vessels that still have limited access groundfish permits, lobster revenues accounted for over 17% of non-groundfish revenue (Murphy et al., 2014 in review). If groundfish landings and revenues continue to decline as they did in 2013, effort in the lobster fishery from those vessels could potentially increase further.

4.7 CLOSED AREA EXEMPTION SPECIFIC AFFECTED ENVIRONMENT

This section of the affected environment focuses on additional information relevant to the closed area exemptions and measures considered in this action. The biological component is based on analysis completed by the Closed Area Technical Team (CATT) for Multispecies Framework Adjustment 48.

4.7.1 Biological Characteristics

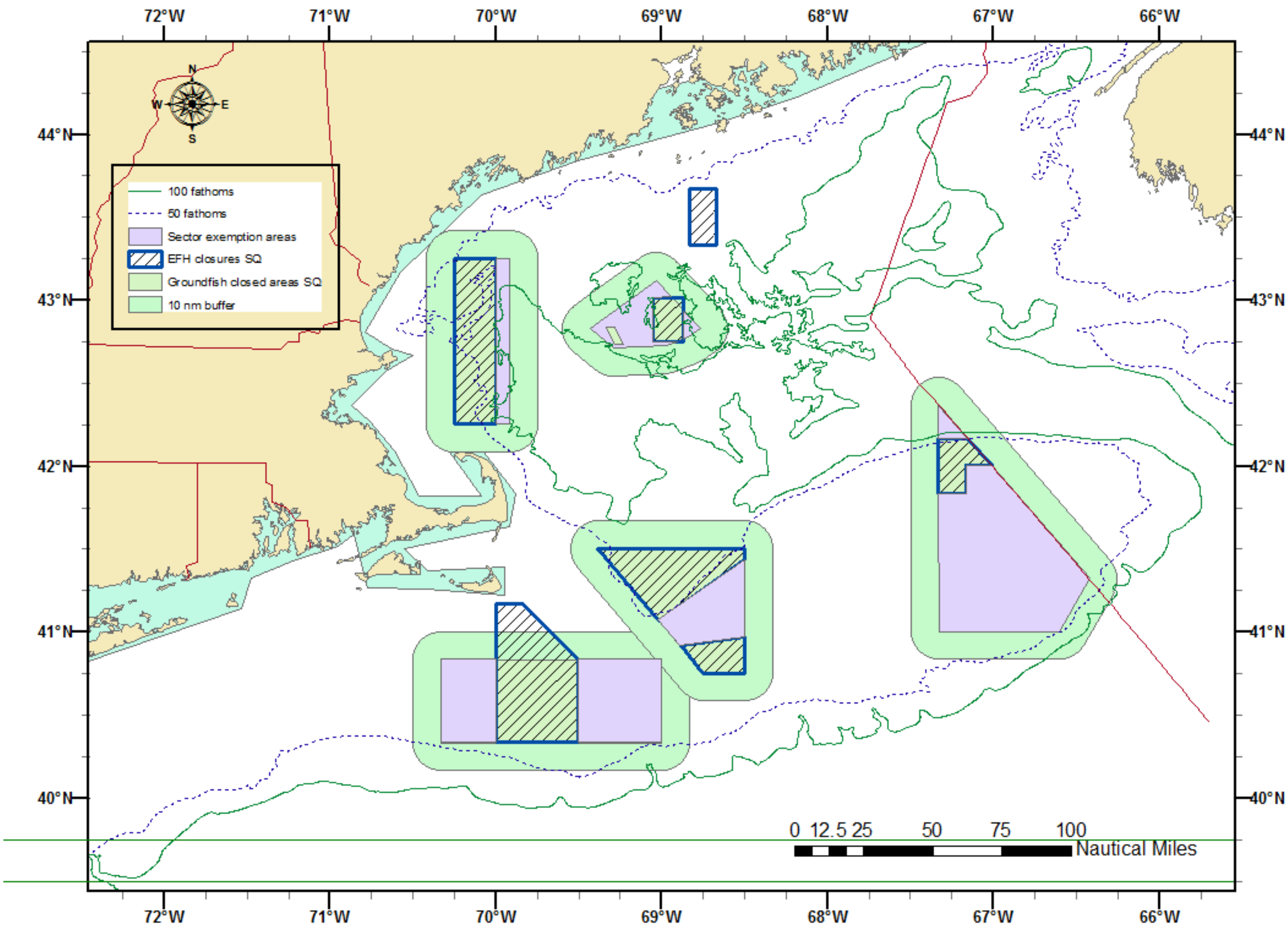
4.7.1.1 Analysis of biological samples on the NMFS spring, fall, and winter surveys

Framework Adjustment (FW) 48 analyzed the potential biological impacts of opening all year-round mortality closure areas to sector vessels. A comparative analysis was conducted using spring, fall, and winter trawl survey data. Biological data examined included routine measurements of finfish, including length, weight, age, sex, and maturity. Unlike FW 48, this action only proposes to allow sector vessels access to Nantucket Lightship Closed Area. Because of this, only FW 48 data from these four areas is included in this section. For additional analyses, including analyses for other stocks and areas, including year-round mortality closure areas in the Gulf of Maine, see FW 48.

Survey tows were tagged according to stock area and the following management area categories (see Figure 17). In many cases, data were insufficient to analysis on an area by area basis, but important differences are noted whenever possible.

- <u>Proposed sector exemption areas</u> including non-habitat closure portions of Closed Area I, Closed Area II, and Nantucket Lightship Area.
- <u>Habitat closure areas</u> including the Cod HAPC, portions of Closed Area I, and all of the area that partially overlaps the Nantucket Lightship Area.
- <u>A 10 nm buffer zone</u> around the existing year round and habitat closed areas. This is a zone that tends to be more intensively fished than other areas open to fishing. One one hand the area exerts greater fishing pressure that could affect biological characteristics compared to other open fishing areas. On the other hand, these areas are most likely to receive any enhanced productivity caused by area closures, a factor that could also affect biological characteristics of caught fish.
- <u>All remaining areas open to fishing</u>, that overlap strata 5-9 and north to the Canadian Border. Data analysis compared fish in the three areas described above to open fishing areas separately in the Gulf of Maine and on Georges Bank.

Figure 17. Areas and buffers applied to analysis of biological data for Framework 48. This discussion focuses on the three southern areas, Nantucket Lightship Closed Area, Closed Area I and Closed Area II.



Most differences were noted in length frequencies – it was found that some year round closed areas were correlated with larger Georges Bank haddock, Georges Bank/Southern New England winter flounder, and Gulf of Maine cod. For a more detailed explanation of these analyses, please see the Framework 48 EA.

4.7.1.2 Data and analysis

A qualitative comparison of the biological characteristics inside the proposed exemption areas, inside the EFH closed areas, adjacent to the existing year round groundfish closed areas, and in open fishing areas elsewhere was in most cases used to make informed decisions for FW 48 and is also sufficient for making decisions for this EA. Additional analyses, such as length/weight and length/depth frequencies, not contained in this EA can be found in the FW 48 EA. Routinely collected biological characteristics for common species that were used in this EA include:

- Individual fish length
- Sex
- Age
- Spawning condition (maturation)

- From these data, derived statistics include:
  - Length at age (i.e are fish in closed areas faster growers)
  - Proportion mature at age (are fish in closed areas early spawners)
  - Distributions of potential spawners (i.e. old, more fecund females)

- The annual spring, fall, and winter surveys provide broad-scale synoptic data to make valid comparisons for the US EEZ. Canadian data and other surveys or research may be informative with more investigation.

- As an initial approach for the FW 48 analyses, the Council's Closed Area Technical Team (CATT) summarized and evaluated the biological data routinely collected on a randomly drawn subset of measured fish on NMFS surveys. Biological measurement data were binned by location into four discrete management area types for comparative analysis. The FW 48 analyses binned the stocks by discrete year round closed areas or stock area (Gulf of Maine vs. Georges Bank/Southern New England). Analyses that did not overlap with any of the year round closed areas considered in this action were removed for this EA (Gulf of Maine cod, for instance). Also, species that were identified in FW 48 as not having a substantial benefit or reliance on the closed areas being considered in this action, such as pollock, are not included in this EA (see Table 58).

Table 58. Comparison of species analyzed in FW 48 and in this EA.

Framework 48 EA	Sector Closed Area Exemption EA
Haddock	Haddock
Pollock	Winter flounder
Redfish	Cod
Monkfish	Yellowtail flounder
Winter Flounder	American Lobster
Winter skate	Winter skate
White hake	Barndoor skate
Cod	Thorny skate
Yellowtail flounder	Smooth skate
American Lobster	Monkfish
Barndoor skate	White Hake
Thorny skate	
Smooth skate	
Atlantic wolffish	

** While the analyses are the same, this EA focuses on the above species because the proposed action does not include several of the closed areas discussed in the FW analysis.*

- The absence of differences in characteristics should be interpreted with caution. Enhanced productivity that might exist would be realized in catches that occur in adjacent areas, particularly for fish that experience greater amounts or frequency of seasonal migration. A benthic species like scallops would be expected to retain the characteristics of closed area management more than pelagic species like dogfish and bluefish, for example.
- Intensified fishing effort on the boundaries of closed areas might occur for two separate reasons. On one hand, the higher fishing effort along closed area boundaries might occur because it is simply a good area to fish and fishing effort has been displaced to the adjacent areas that remain open. On the other hand, lower mortality and growth of stocks in closed areas might increase CPUE along the boundaries, which is harvested more intensely by the fishery. This effect has been studied, is suspected to occur, but is difficult to reliably demonstrate.

- Spawning condition should not be over-interpreted. Spawning condition on surveys is based on visual examination of gonads by trained biologists, but have not been determined via histology. Subtle differences between spent and resting, for example, are sometimes subjective and vary with the experience of the fish cutter.

- The six panel tables and associated maps below provide graphical comparisons of biological characteristics for the above species. All data are from the spring, fall, and winter surveys since 2002 (10-11 years). Since the evaluation focuses on spawning and biological characteristics sometimes vary by sex, only data for female fish are analyzed. The winter survey began in 1992 and was terminated in 2007 and does not survey the Gulf of Maine.

In addition to analyses for FW 48, this EA includes analyses of survey tows by catch distribution (presence/absence) and catch per tow (mean weight/tow). These analyses were were grouped by the years 2003-2007 and 2008-2012.

4.7.1.3 General observations

1. Exemption and habitat areas characteristically shelter larger haddock, yellowtail flounder, winter flounder, and possibly cod.

2. Since larger fish are more fecund, the year round closed areas have provided a spawning refuge for haddock, yellowtail flounder (included because of the high proportion of spawning females in Closed Area II), and winter flounder.

3. Larger cod in deep water appear to be offered protection from fishing in the EFH closed areas (not being proposed for opening in this action), in both spring and fall.

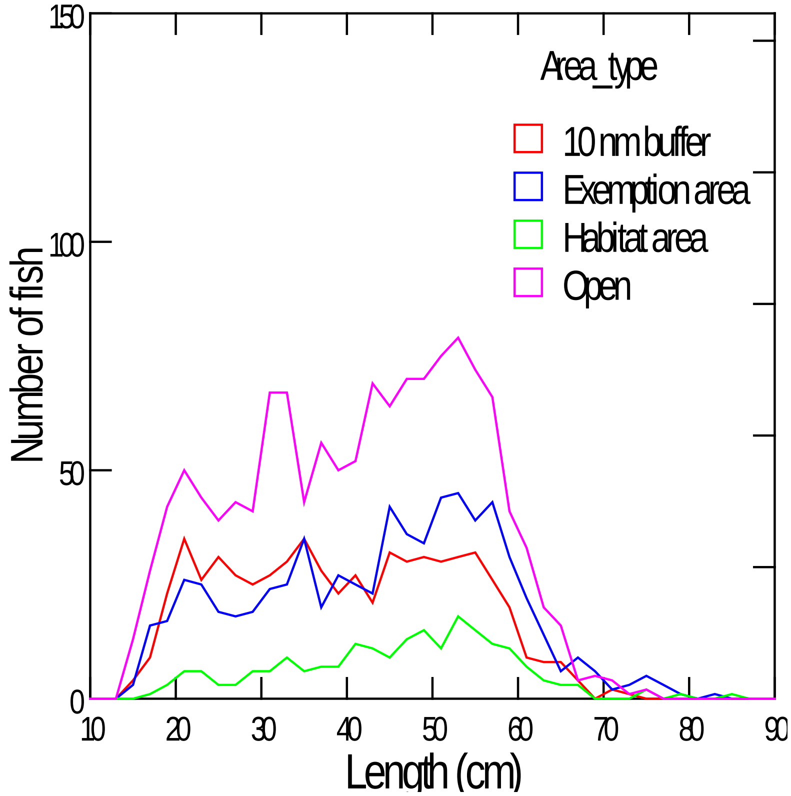
4.7.1.4 Comparative analysis of biological characteristics

The following descriptions below summarize observable differences or lack of differences in the biological characteristics measured on the spring, fall, and winter NMFS trawl surveys for species likely to be most affected by sector exemptions. When the discussion below points out a notable characteristic for a species on one or more of these surveys, a graph or map may be included in the following descriptions as needed.

4.7.1.4.1 Haddock

Haddock are expected to be one of the primary target species while fishing in sector exemtion areas, particularly when fishing in Closed Area I and Closed Area II. Particularly in Closed Area II, haddock tend to be larger than in other areas and survey CPUE appears to be significantly higher than elsewhere. Conservation through closed areas appears to offer haddock lasting protection from fishing and larger haddock appear to exist in the existing EFH areas and in the sector exemtion areas in both Georges Bank (Figure 18). Greater proportions of larger haddock occur in these areas than elsewhere.

Figure 18. Comparative length frequencies of female Georges Bank haddock during 2002-2012 spring surveys

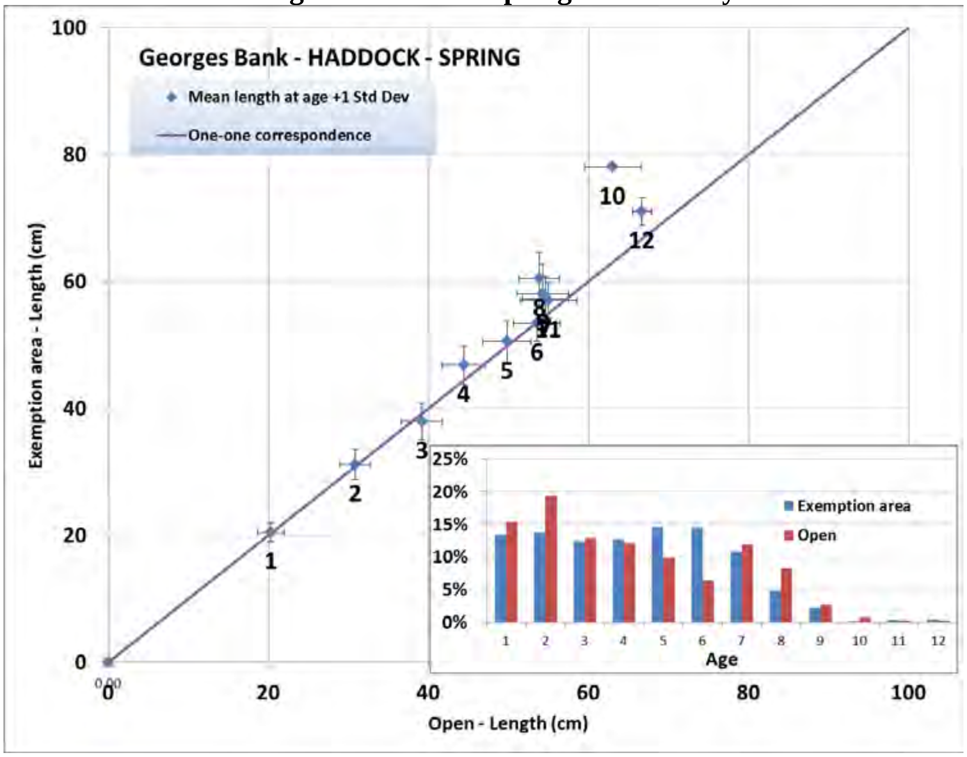


This observation based on analysis of NMFS trawl survey data is supported from the results of Kerr et al (ms), which found that the Closed Area I and Nantucket Lightship Area closures had a significant positive effect on haddock biomass. Kerr et al. however did not find significant positive effects for haddock in Closed Area II, despite the large amounts of haddock biomass that occurs there. Kerr et al. said that although "CAII was originally designed to protect haddock spawning and the results of the BACI analysis indicate it was not effective at enhancing the productivity of this species. No significant positive impacts of this closure (location:period interactions) were detected with respect to the probability of occurrence of haddock in survey tows or survey catch (number) and catch (weight) per tow. However, a significant negative effect of the closure was detected, wherein catch (number) per tow of haddock was significantly higher outside-after closure."

Closer examination of the spring survey data, however, reveals that this result may be due to the behavior and distribution of year classes in and around Closed Area II, particularly for the strong 2000 and 2003 year classes. At age 5, a fairly high (i.e. ~40%) fraction of haddock were sampled on tows in Closed Area II (Cod HAPC and the proposed sector exemption areas; see Figure 19). Generally the proportions for the 2001, 2002, and 2004 year classes should be ignored due to low sample size.

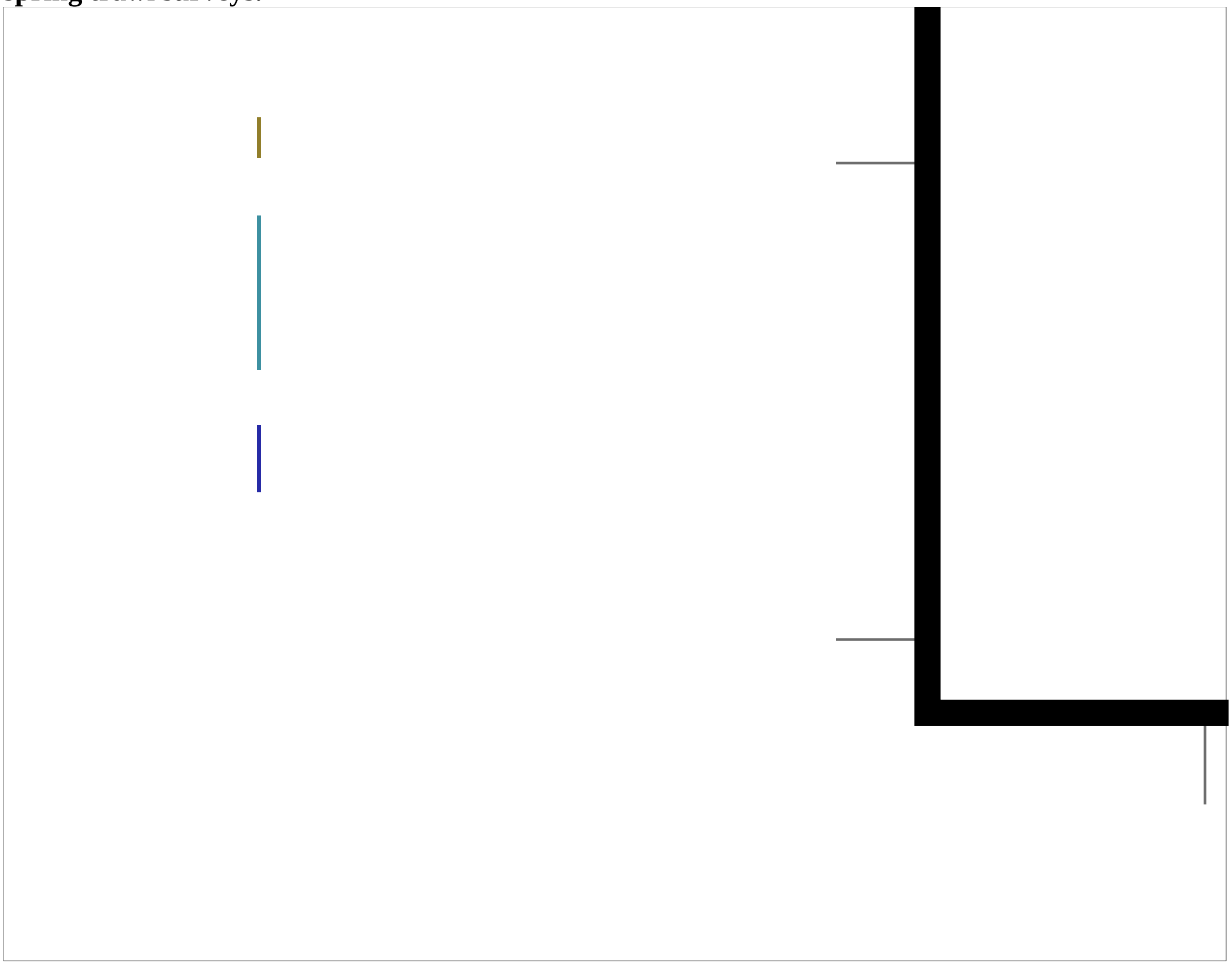
The lenghs at age show a slight trend toward larger fish in the Georges Bank exemption areas (Figure 19). Points falling on the line of one to one correspondence indicate that the lengths at age are identical. Points falling above the line indicate that the haddock in the exemption areas or habitat areas are larger than those at the same age in open fishing areas, and vice versa.

Figure 19. Comparison of Georges Bank female haddock lengths at age between proposed those caught in the proposed sector exemption areas and those caught in currently open fishing areas during the 2003-2012 spring trawl surveys



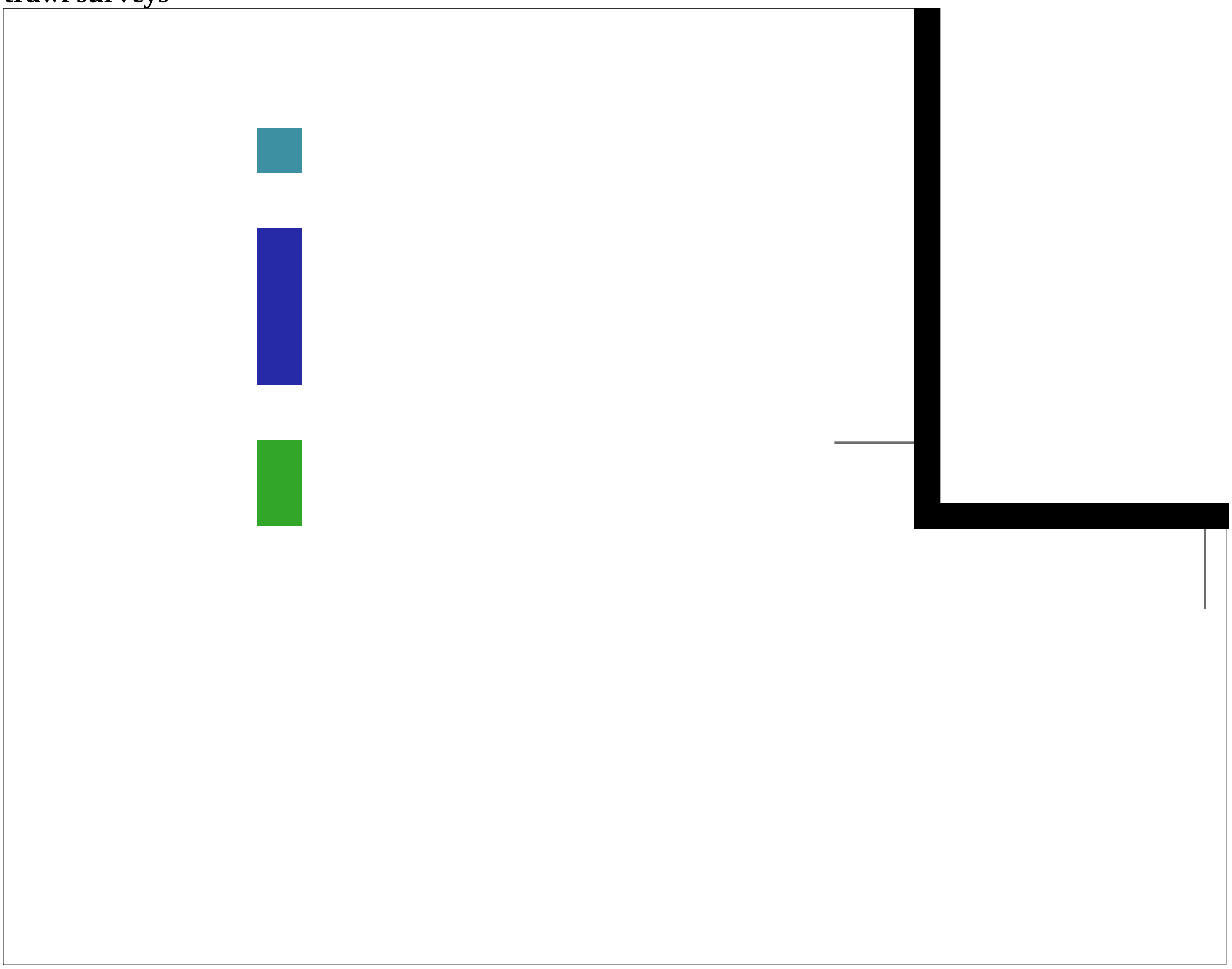
Larger haddock appear to be widely distributed across the eastern part of Georges Bank, particualrly in Closed Area II and in Canadian waters (Figure 20), during the spring survey. Haddock elsewhere tend to be smaller, whether on the western part of Georges Bank or in the Gulf of Maine. Most of the haddock captured in the spring survey are inshore and to the west of the Western Gulf of Maine area, or in its SW corner. During the fall, most of the larger haddock are distributed along the northern edge of Georges Bank in US and Canadian waters (Figure 20).

Figure 20. Geographical distribution of female haddock length frequency during the 2003-2012 spring trawl surveys.



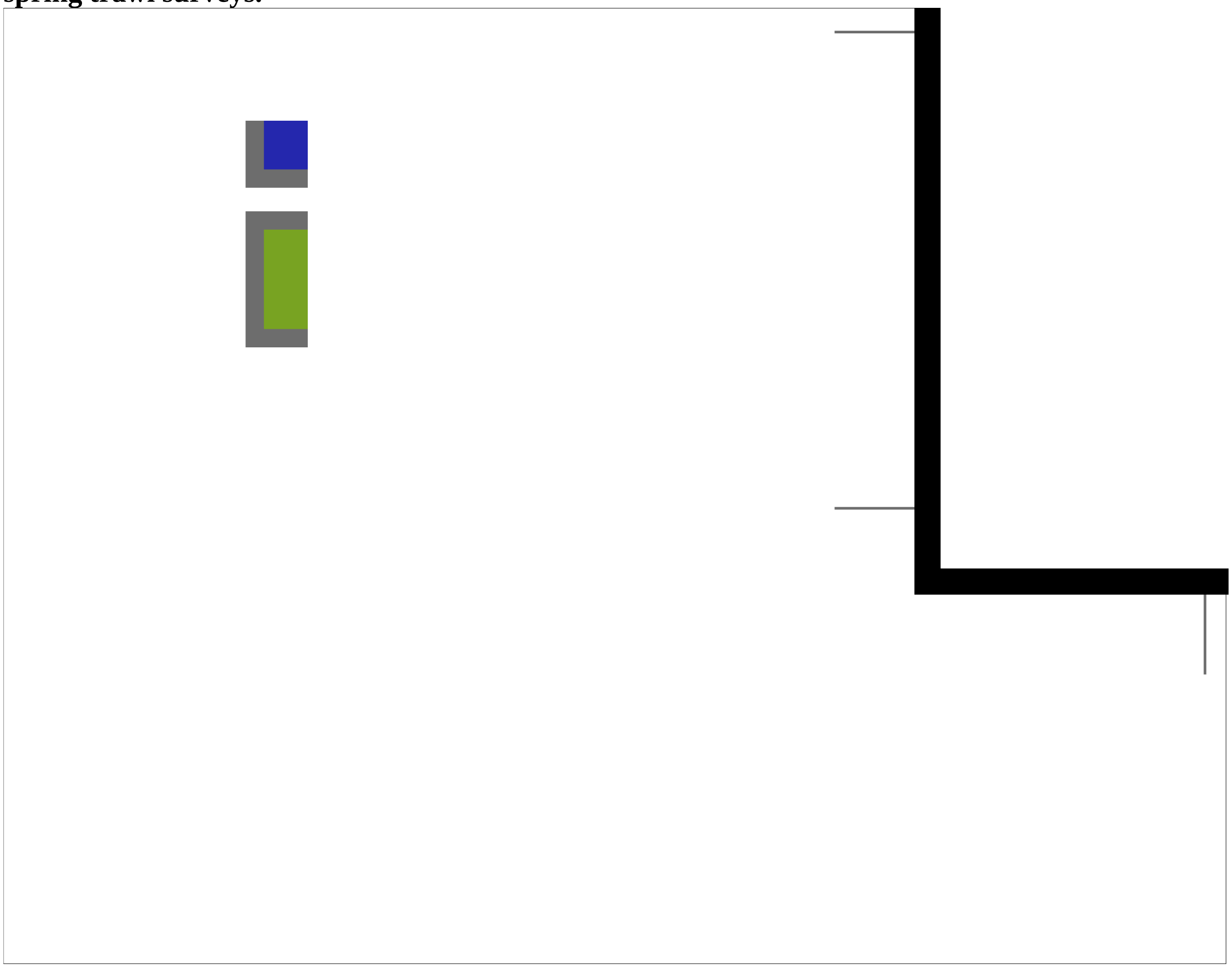
In contrast to the spring survey data, the smaller haddock in the fall occupy the shallower portions of Georges Bank, the Great South Channel, and Massachusetts Bay (Figure 21). Larger haddock (i.e. > 30 cm) occupy deeper water along the northern edge of Georges Bank, which overlaps the Cod HAPC and Closed Area II north of the HAPC, and in the northern part of Closed Area II which is also a habitat closed area.

Figure 21. Geographical distribution of female haddock length frequency during the 2002-2011 fall trawl surveys



During the spring when haddock spawning occurs, the distibution of ripe female haddock is concentrated in the shallower portions of the northern and central portion of Closed Area II, in Canada, and near Stellwagen Bank and sothern Jeffries Ledge, inshore of the Western Gulf of Maine area (Figure 22).

Figure 22. Geographical distribution of female haddock maturity stages during the 2003-2012 spring trawl surveys.



The largest female haddock (i.e. age 8+), appear to be fairly widely distibuted, but found mainly in the closed areas (Closed Area I, Closed Area II, and Western Gulf of Maine areas) or in Canada (Figure 23). A notable portion of the largest female haddock in the spring are found in open fishing areas, west of the Western Gulf of Maine area.

Figure 23. Geographical distribution of 8+ female haddock during the 2003-2012 spring, 2002-2011 fall and 2002-2007 winter trawl surveys.

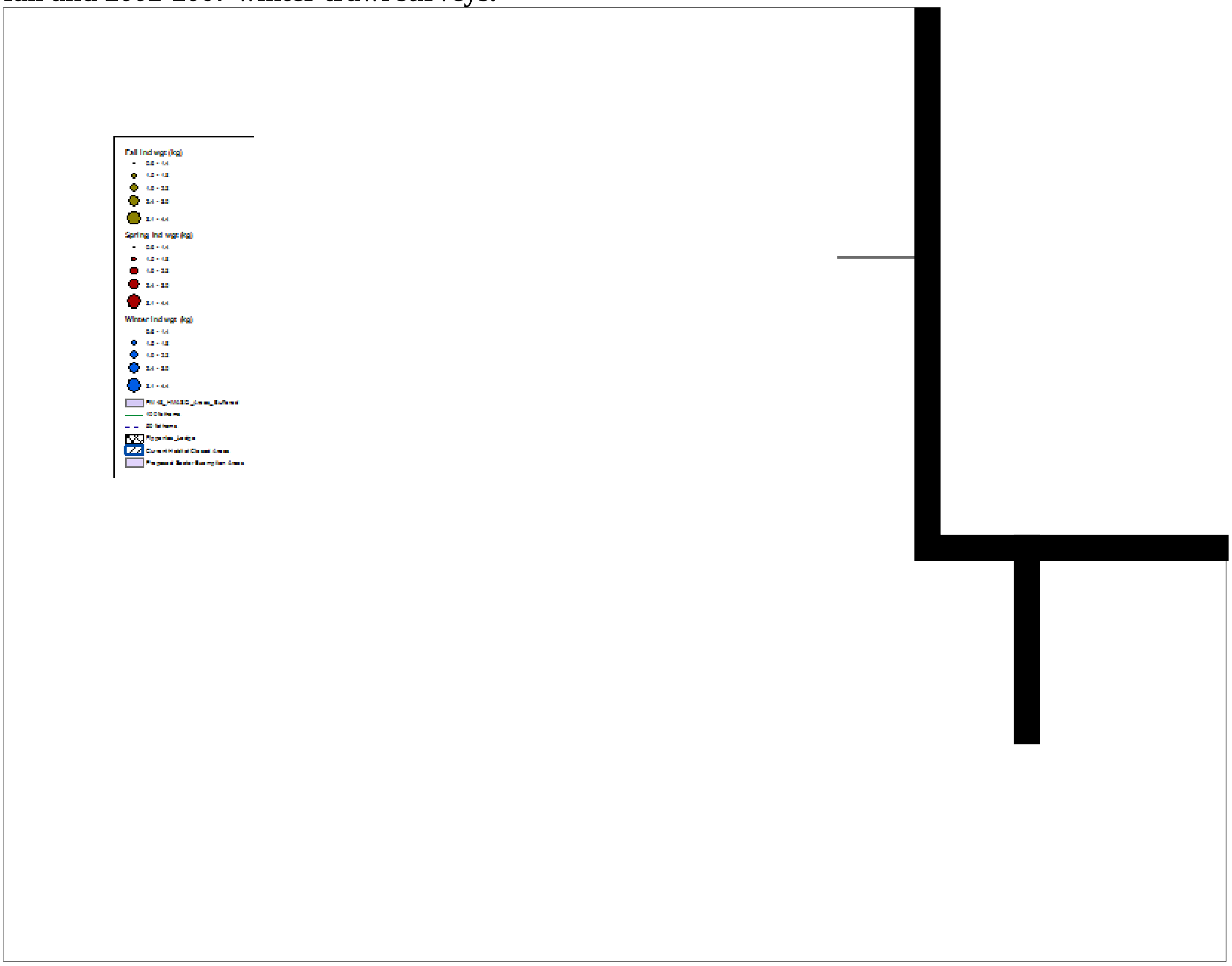


Figure 24. Year class strength and percent of aged haddock in spring survey samples by management area and year class.

Haddock distribution appears to have stayed relatively consistent over the past decade, with most haddock catch concentrating east of Cape Ann, MA and along the northern and eastern edges of Closed Area II (Figure 25). There does not seem to be any concentration of larger (weight) fish in area particular area (Figure 26).

Figure 25. Haddock distribution maps from survey tows

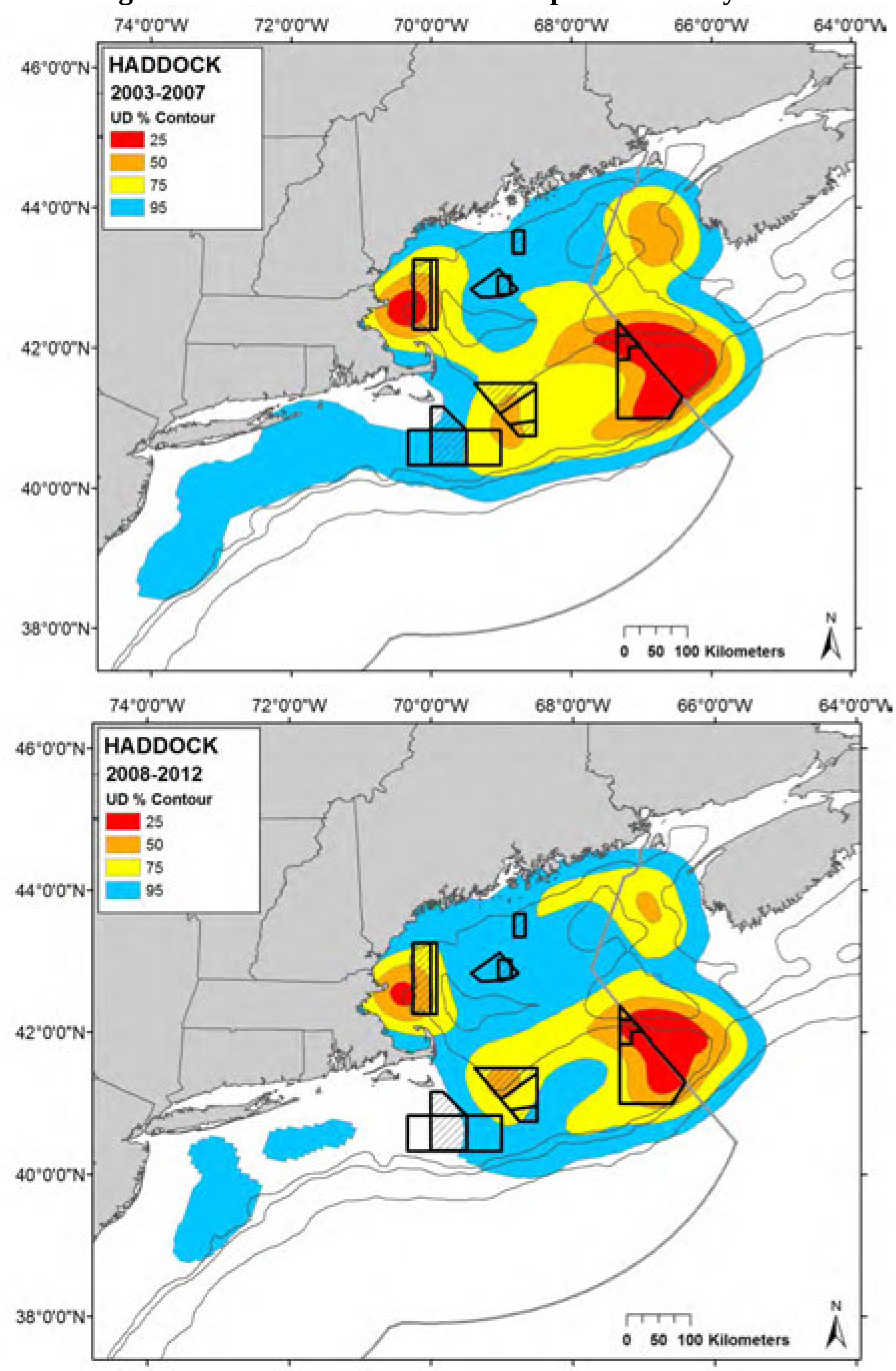
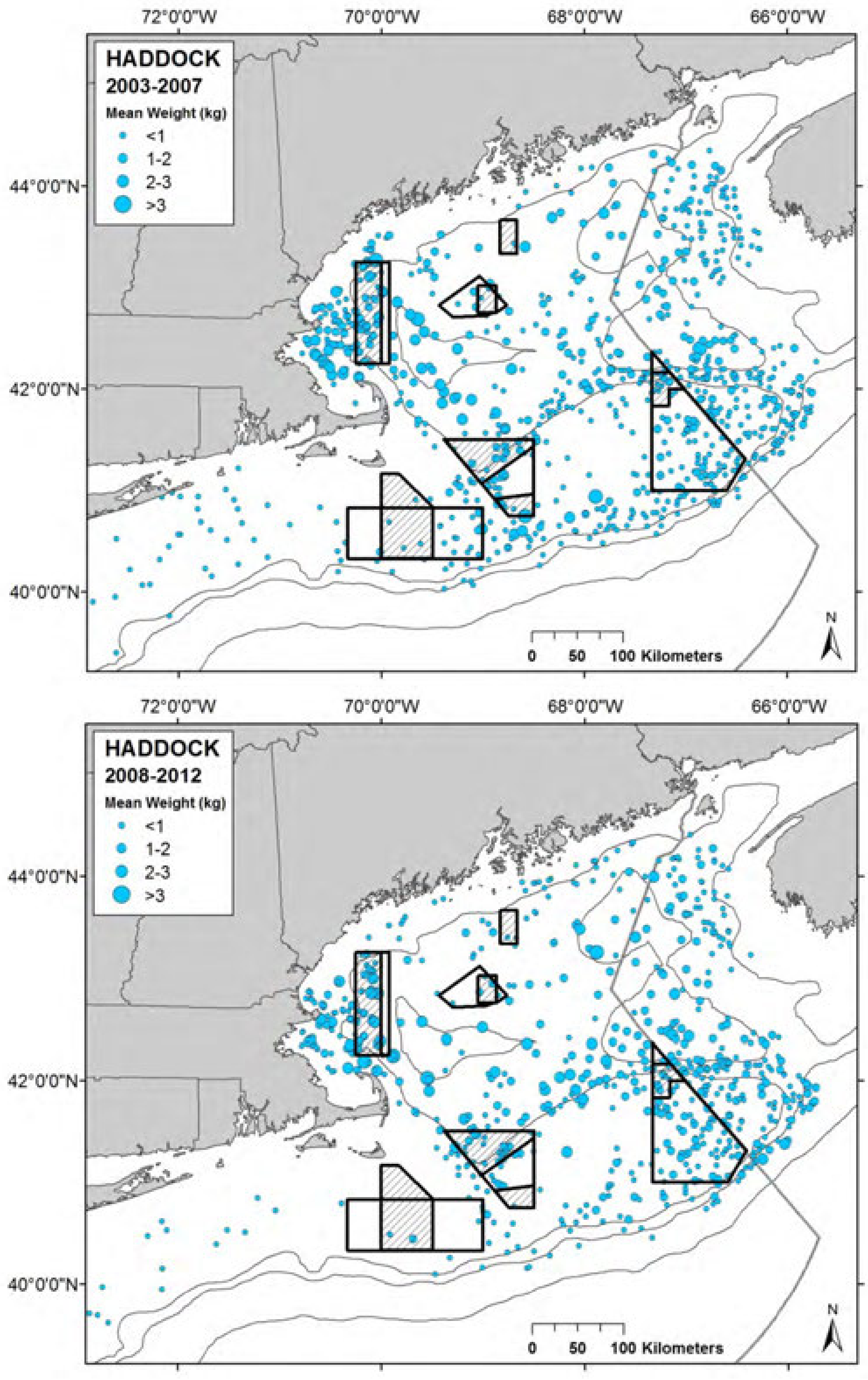


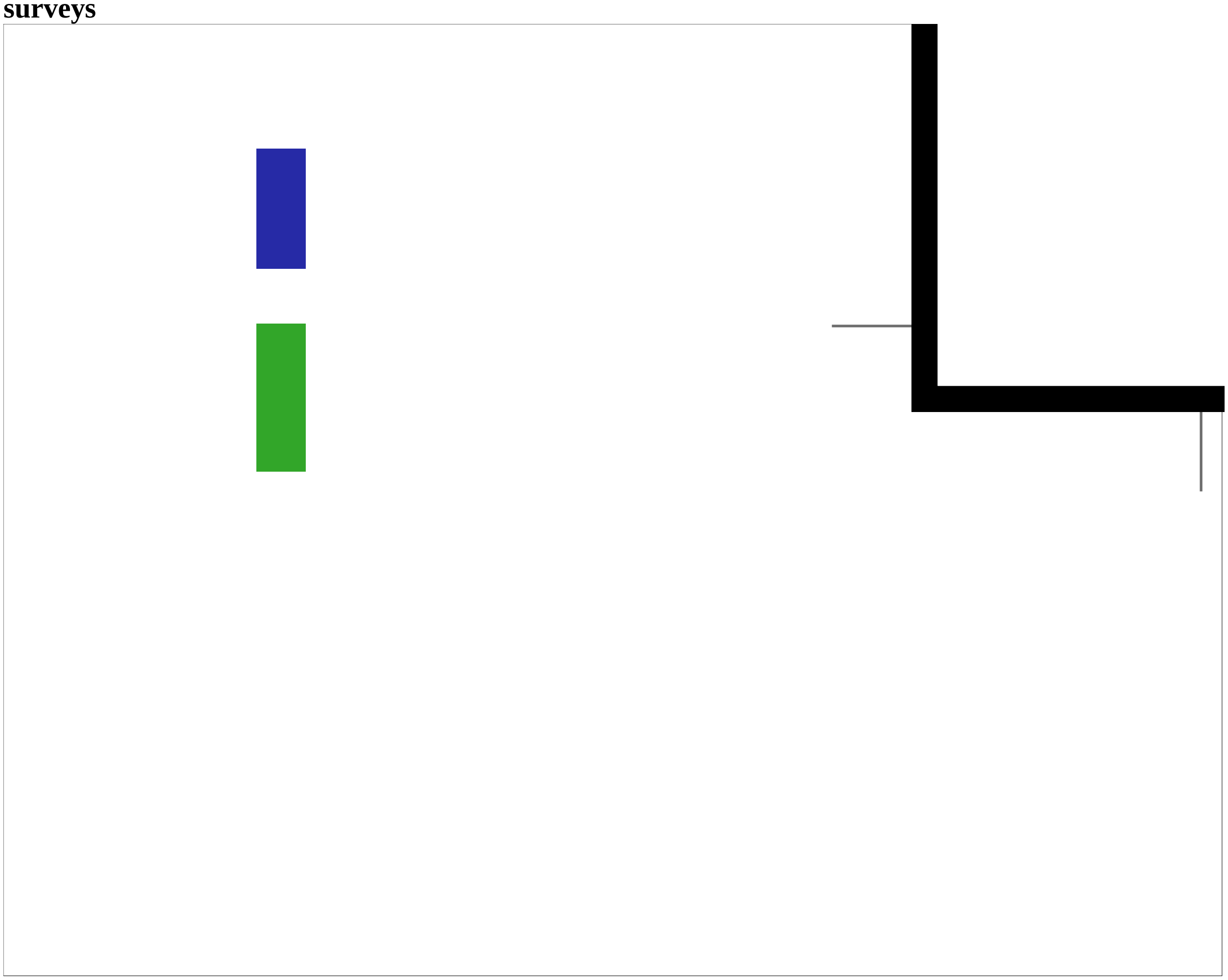
Figure 26. Haddock mean weight per tow from survey tows



4.7.1.4.2 Winter skate

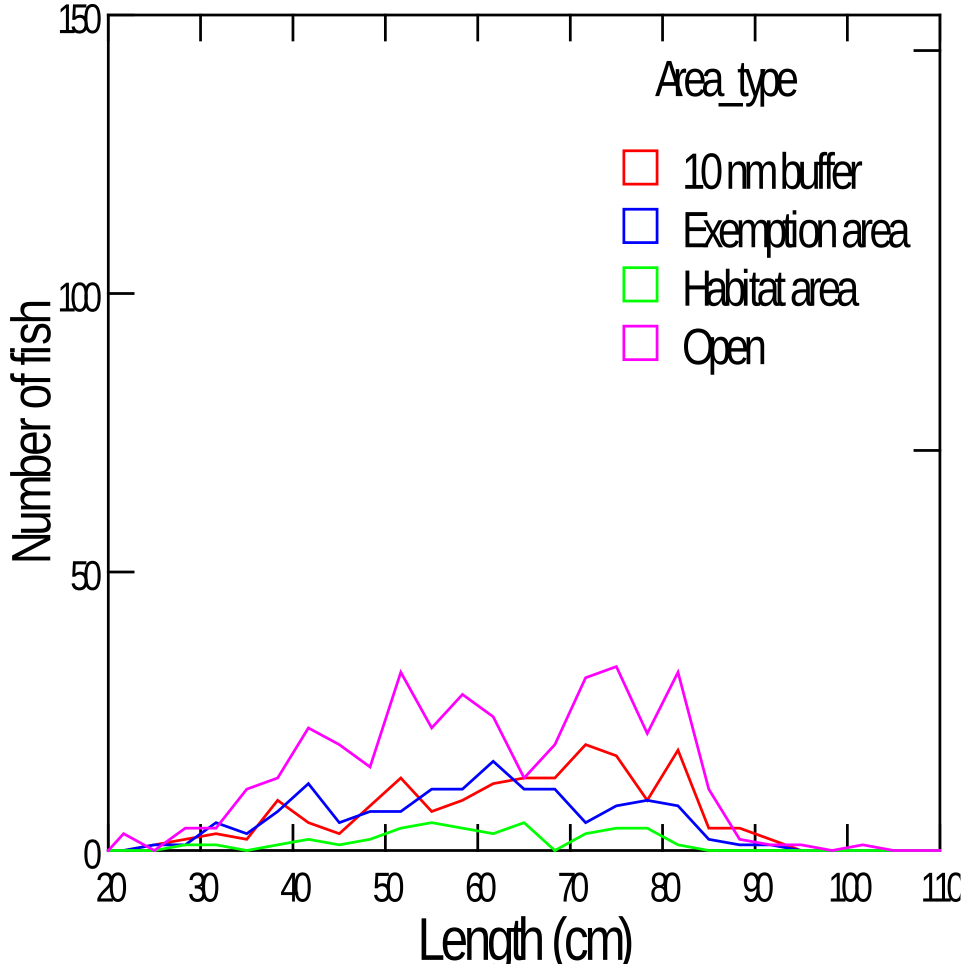
Winter skate are a primary target species for some vessels in the groundfish fleet, using trawls and particularly gillnets. Winter skate captured in the spring and fall (Figure 27) trawl surveys are widely distributed across Southern New England, Georges Bank, and the southern part of the Gulf of Maine. In the Gulf of Maine, few winter skate were observed in the Western Gulf of Maine or Cashes Ledge areas, however.

Figure 27. Geographic distribution of winter skate length frequencies during 2002-2012 fall surveys



Winter skate on Georges Bank were observed in all three year round closed areas, but their size distribution (Figure 28) and other biological characteristics in these areas is unremarkable. Winter skate are routinely sampled for length, weight, and maturity, but are not aged.

Figure 28. Comparative length frequencies of female Georges Bank winter skate during 2002-2011 fall surveys.



The distribution of winter skate has concentrated into Closed Area II over the last five years (Figure 29). There does not appear to be any trends in weight/tow (Figure 30).

Figure 29. Winter skate distribution maps from survey tows

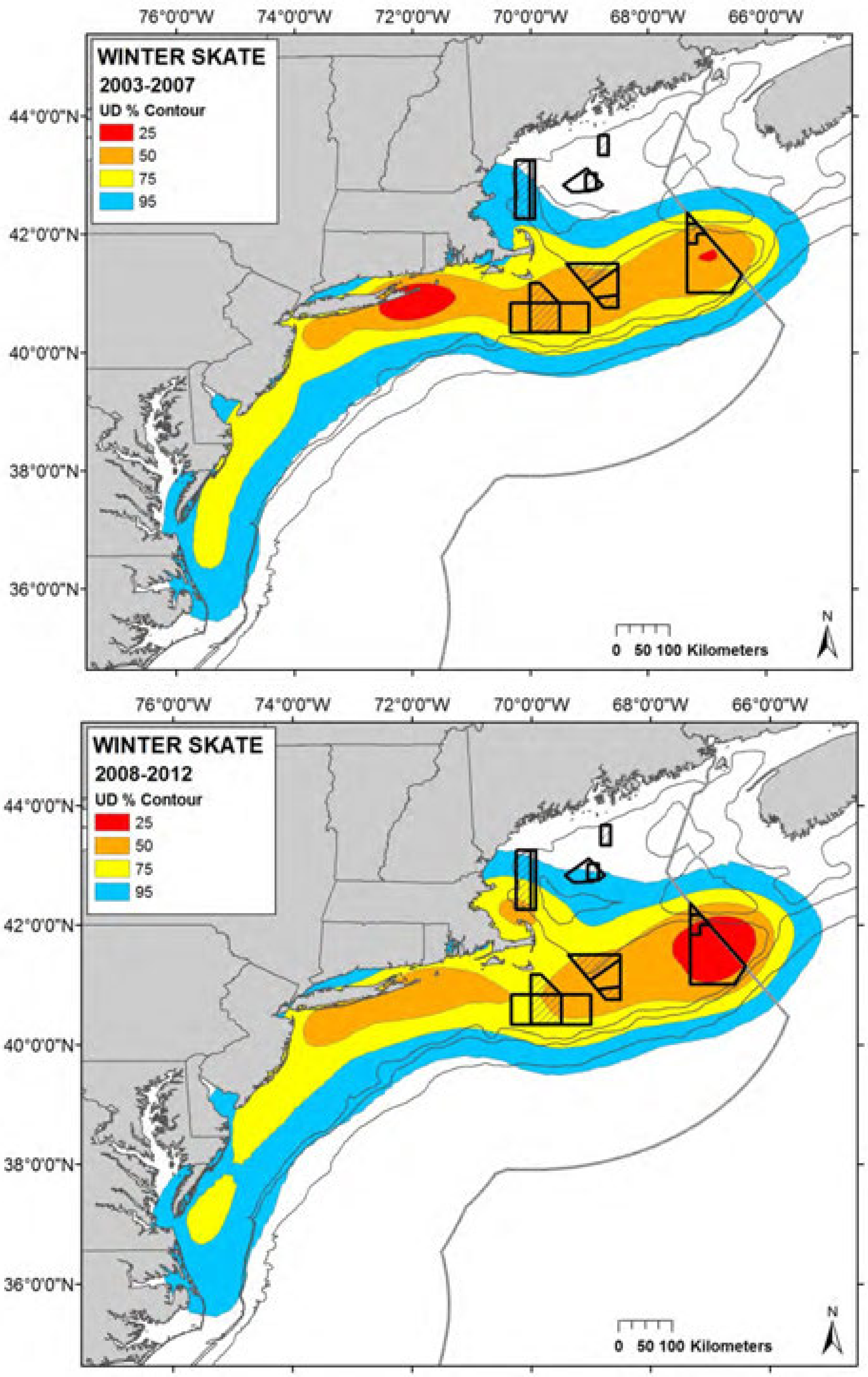
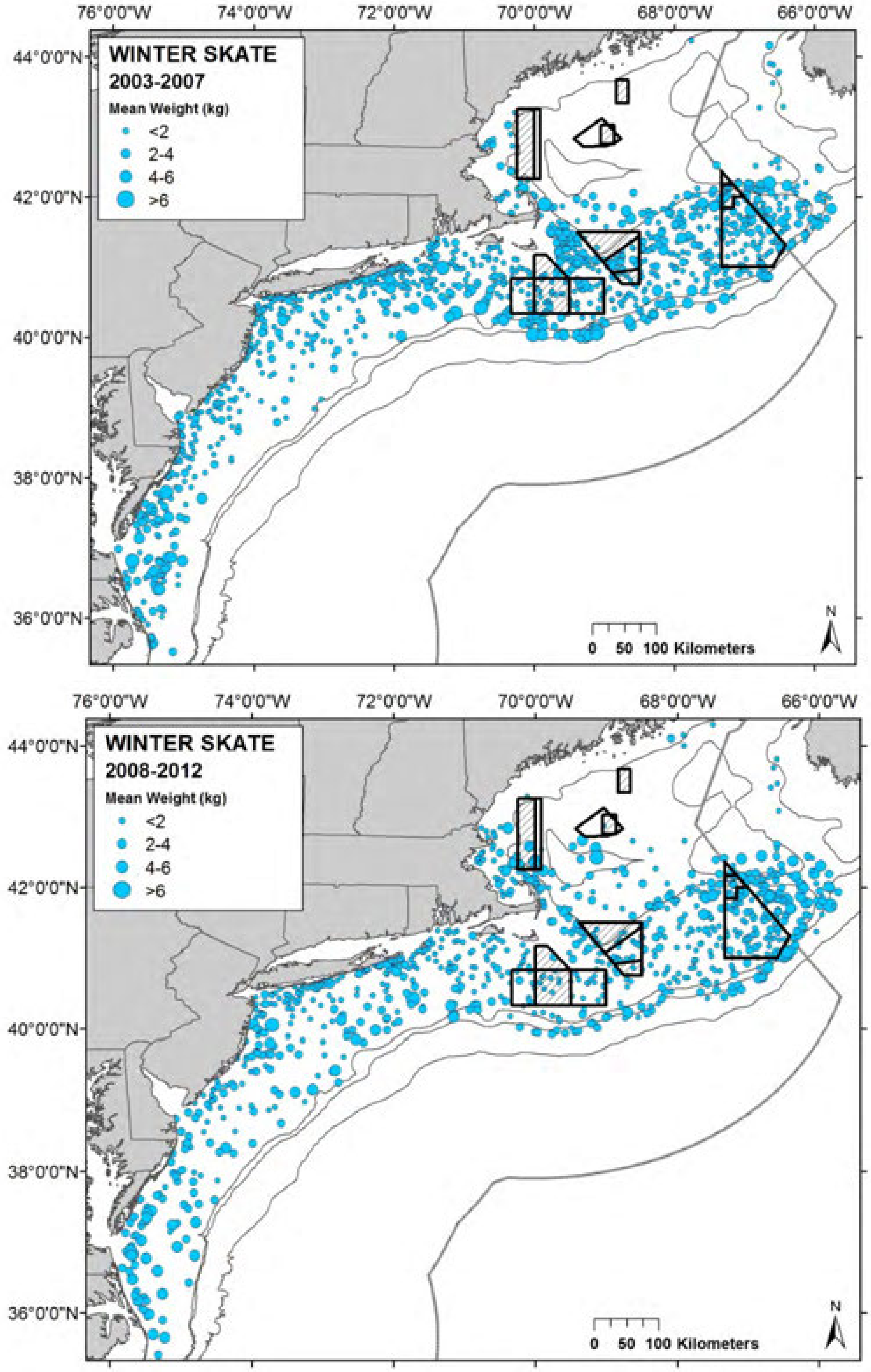


Figure 30. Winter skate mean weight per tow from survey tows



4.7.1.4.3 Yellowtail flounder

While the previous analyses focused on Georges Bank because the species stock areas proposed in this action are restricted to Georges Bank, the Gulf of Maine/Cape Cod yellowtail flonder stock includes a portion of Closed Area I. Because of this, analyses for both Georges Bank and Gulf of Maine/Cape Cod are included here. The spring and fall surveys catch yellowtail flounder in Southern New England, the southern and eastern portion of Georges Bank, and the shallower portions of the Gulf of Maine, including Massachusetts and Ipswich Bays. In the spring, most of the developing female yellowtail flounder are in the Closed Area II exemption area and in Canada (Figure 31), with some additional fish in the open fishing areas near the SW part of Georges Bank. Nearly 80% of age 3 fish are developing with few observable differences in maturation among types of management areas. Differences for length at age (Figure 32) were not observed for either yellowtail flounder in the proposed exemption areas or in current habitat closed areas. Differences in the relative proportion of yellowtail flounder at length among types of management areas were not observed in either Georges Bank (Figure 33) or the Gulf of Maine (Figure 34).

Figure 31. Geographical distribution of female yellowtail flounder maturity stages during the 2002-2012 spring trawl surveys.

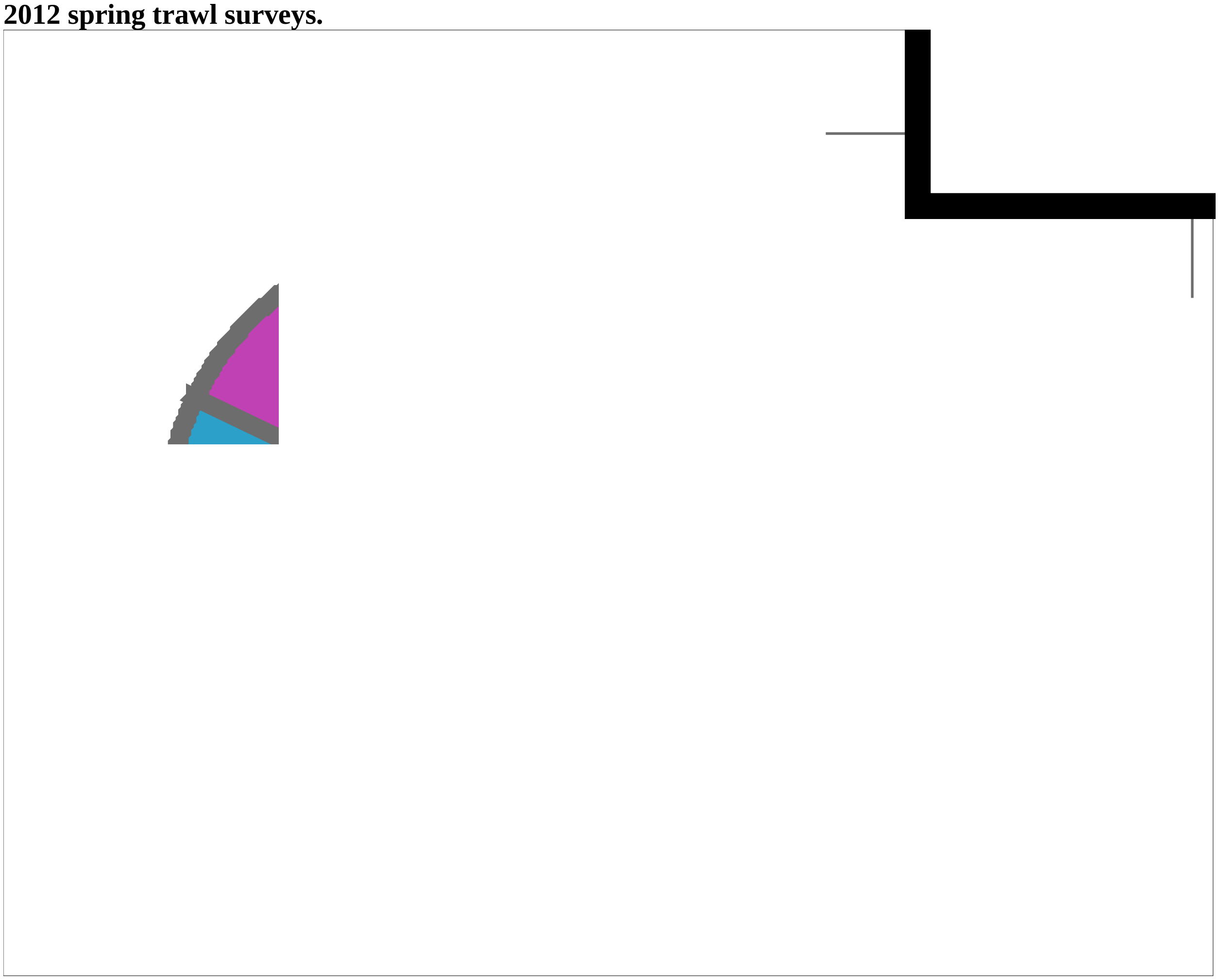


Figure 32. Comparison of Georges Bank female yellowtail flounder lengths at age between proposed those caught in the existing habitat areas and those caught in currently open fishing areas during the 2002-2012 spring trawl surveys.

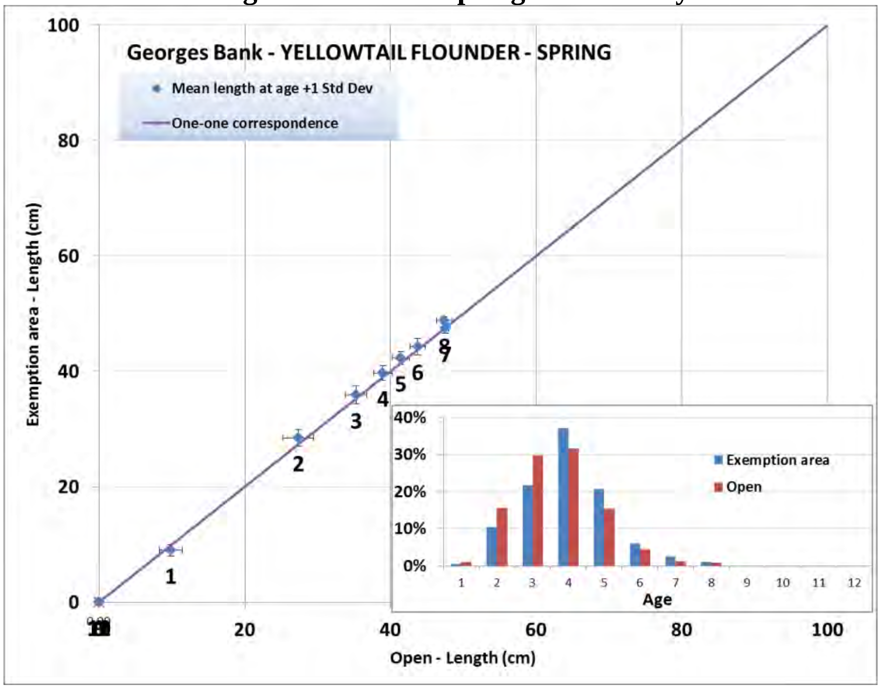


Figure 33. Comparative length frequencies of female Georges Bank yellowtail flounder during 2002-2012 spring surveys.

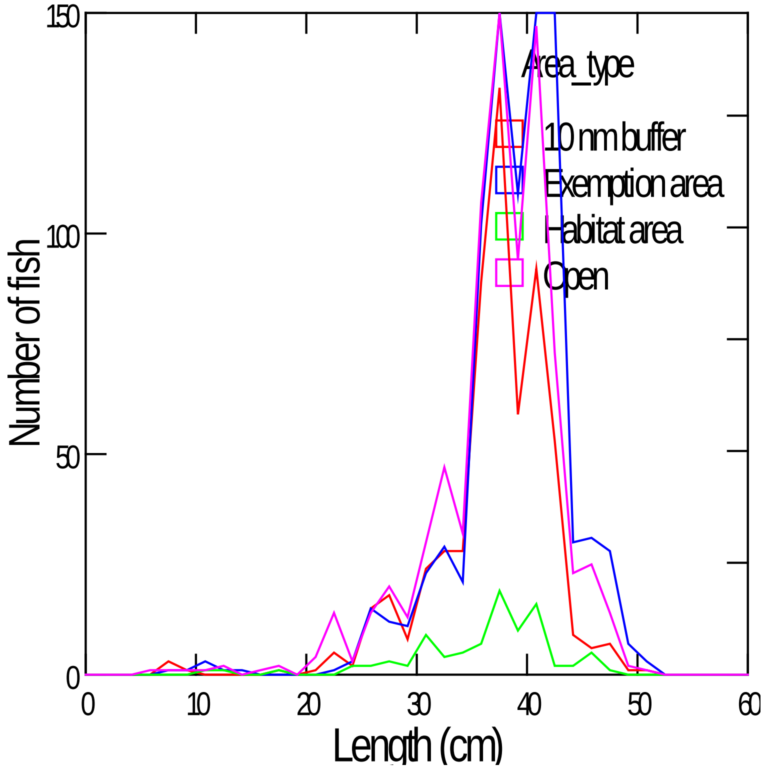
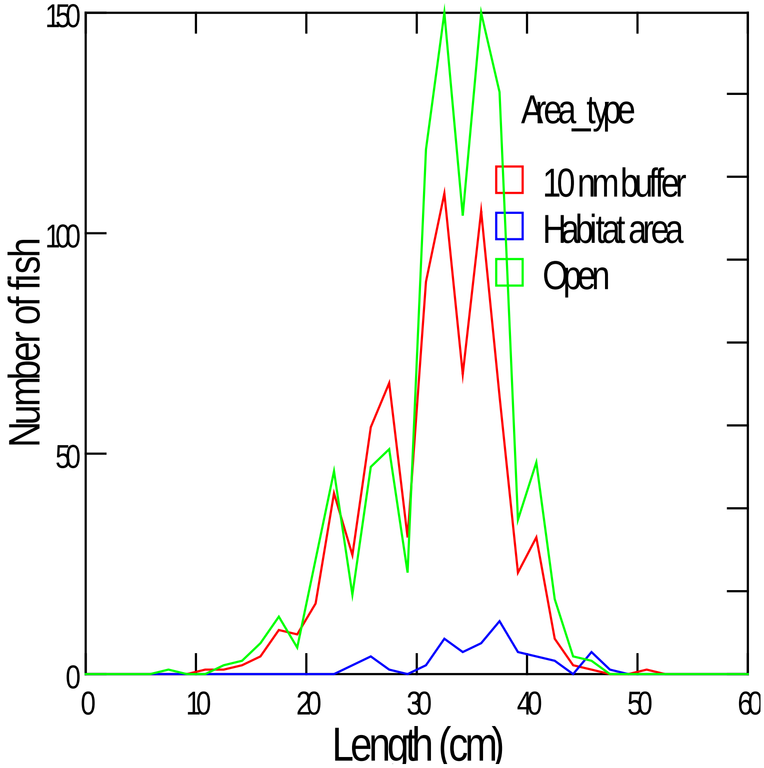
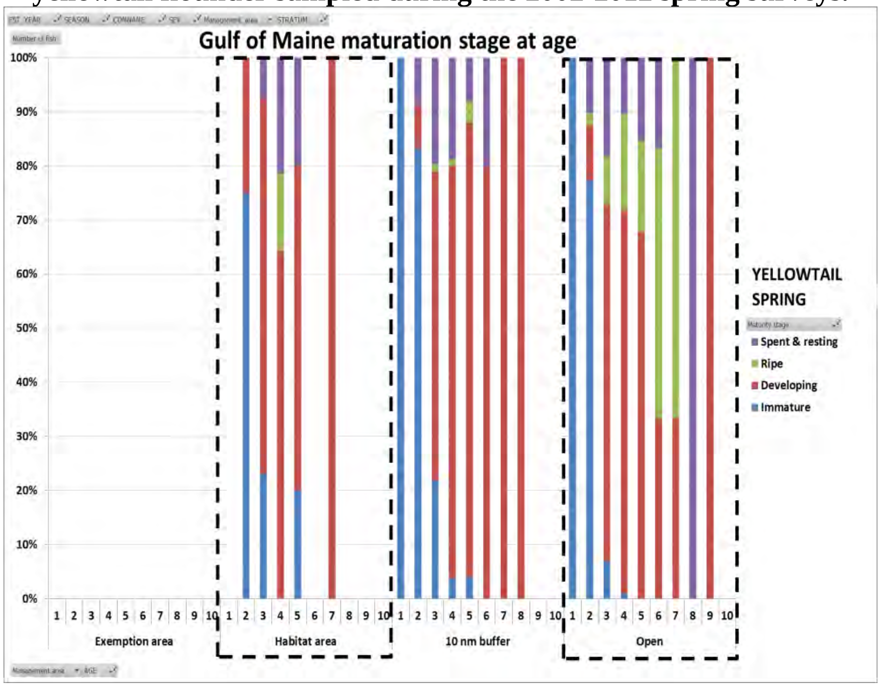


Figure 34. Comparative length frequencies of female Gulf of Maine yellowtail flounder during 2002-2012 spring surveys.



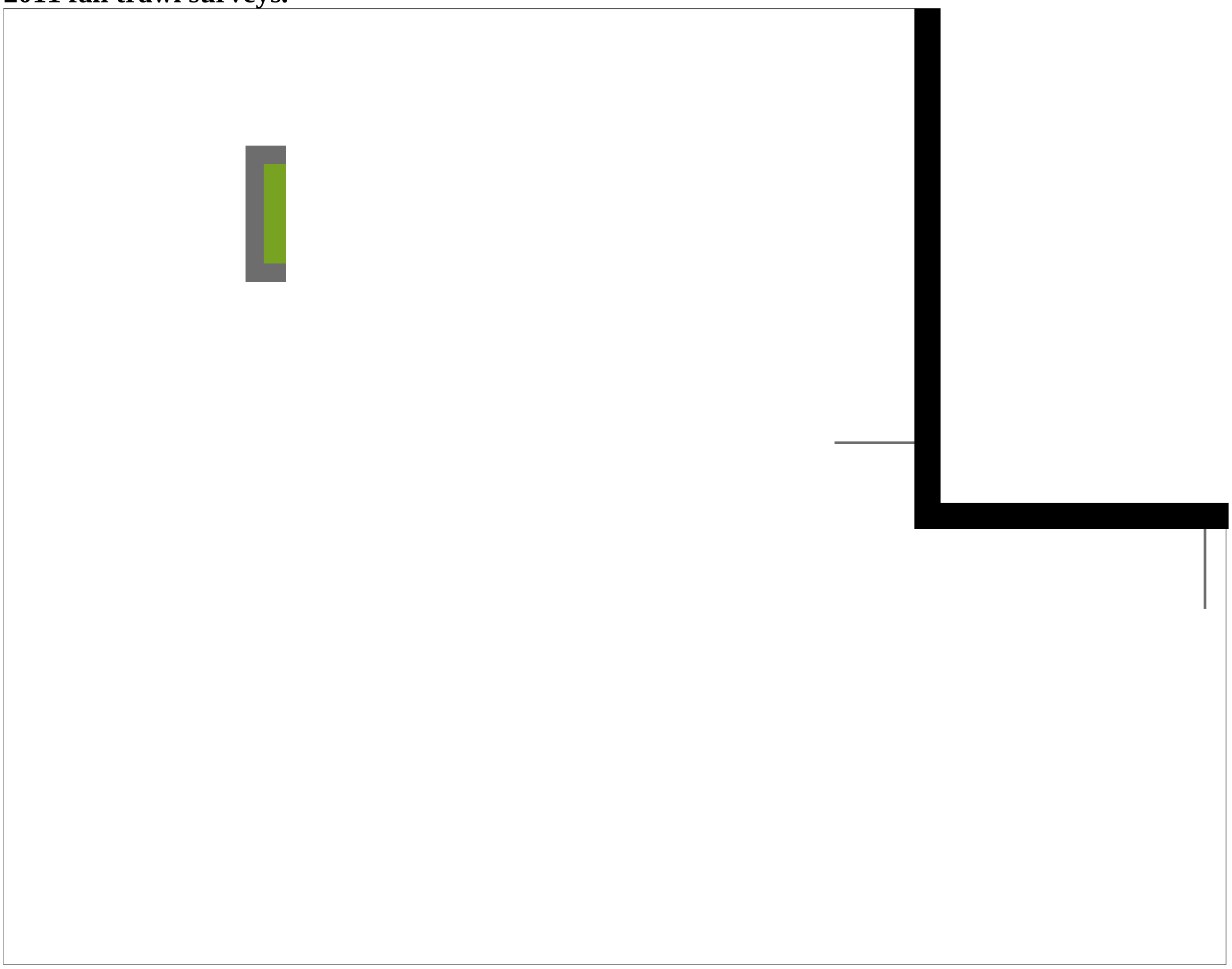
In the Gulf of Maine, most of the yellowtail flounder were developing, but more of the flunder were in ripe spawning condition in the open fishing areas (Figure 35). This diffierence is probably caused more by a timing issue than due to a spawning aggregation.

Figure 35. Proportion mature at age by type of management area for female Gulf of Maine yellowtail flounder sampled during the 2002-2012 spring surveys.



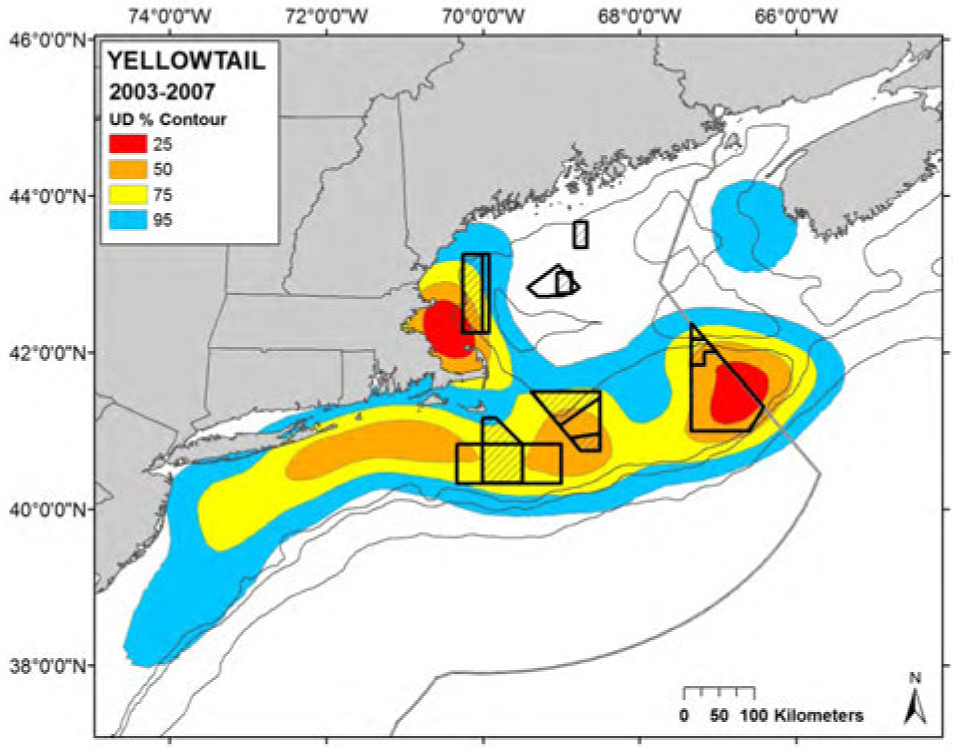
In the fall survey, most of the yellowtail flounder are caught in southern Georges Bank, overlapping the sector exemption area of Closed Area II, in the Great South Channel, overlapping the sector exemption areas of the Nantucket Lightship Area and Closed Area I, and in Massachusetts and Ipswich Bays (Figure 36).

Figure 36. Geographical distribution of female yellowtail flounder maturity stages during the 2002-2011 fall trawl surveys.



Yellowtail flounder catch distribution is highest in inshore Gulf of Maine between Cape Cod and Cape Ann, off Massachusetts Bay, as well as in Closed Area II. Concentrations have increased more recently in inshore Gulf of Maine, but yellowtail are also frequently found in the area between the eastern edge of the Nantucket Lightship Closed Area and Closed Area I (Figure 37). There do not appear to be any areas where larger yellowtail flounder are congregating (Figure 38).

Figure 37. Yellowtail flounder distribution maps from survey tows



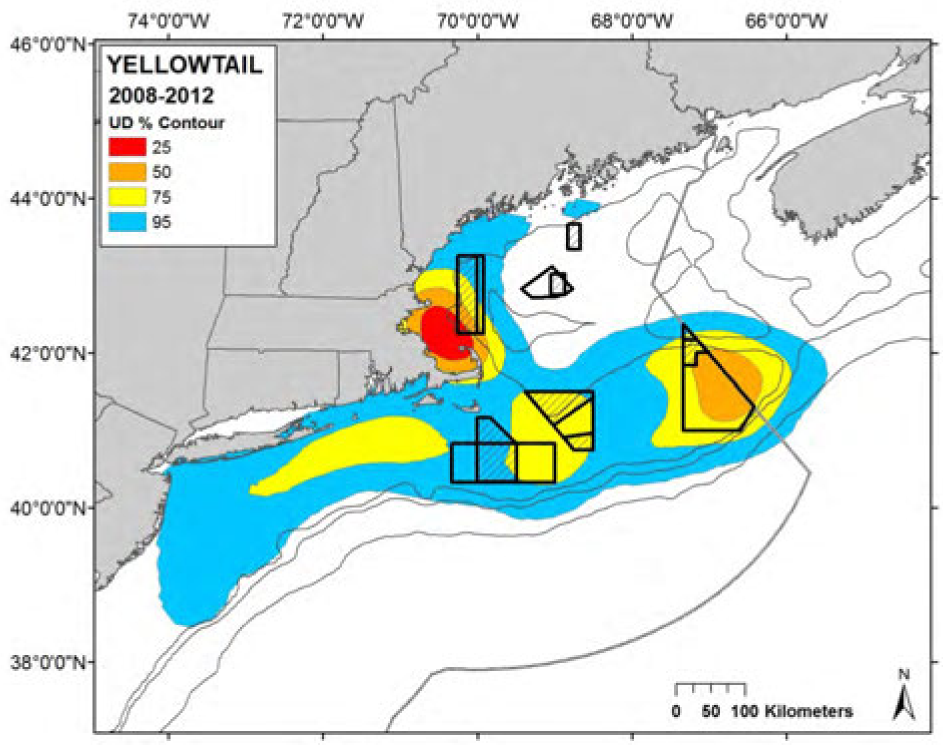
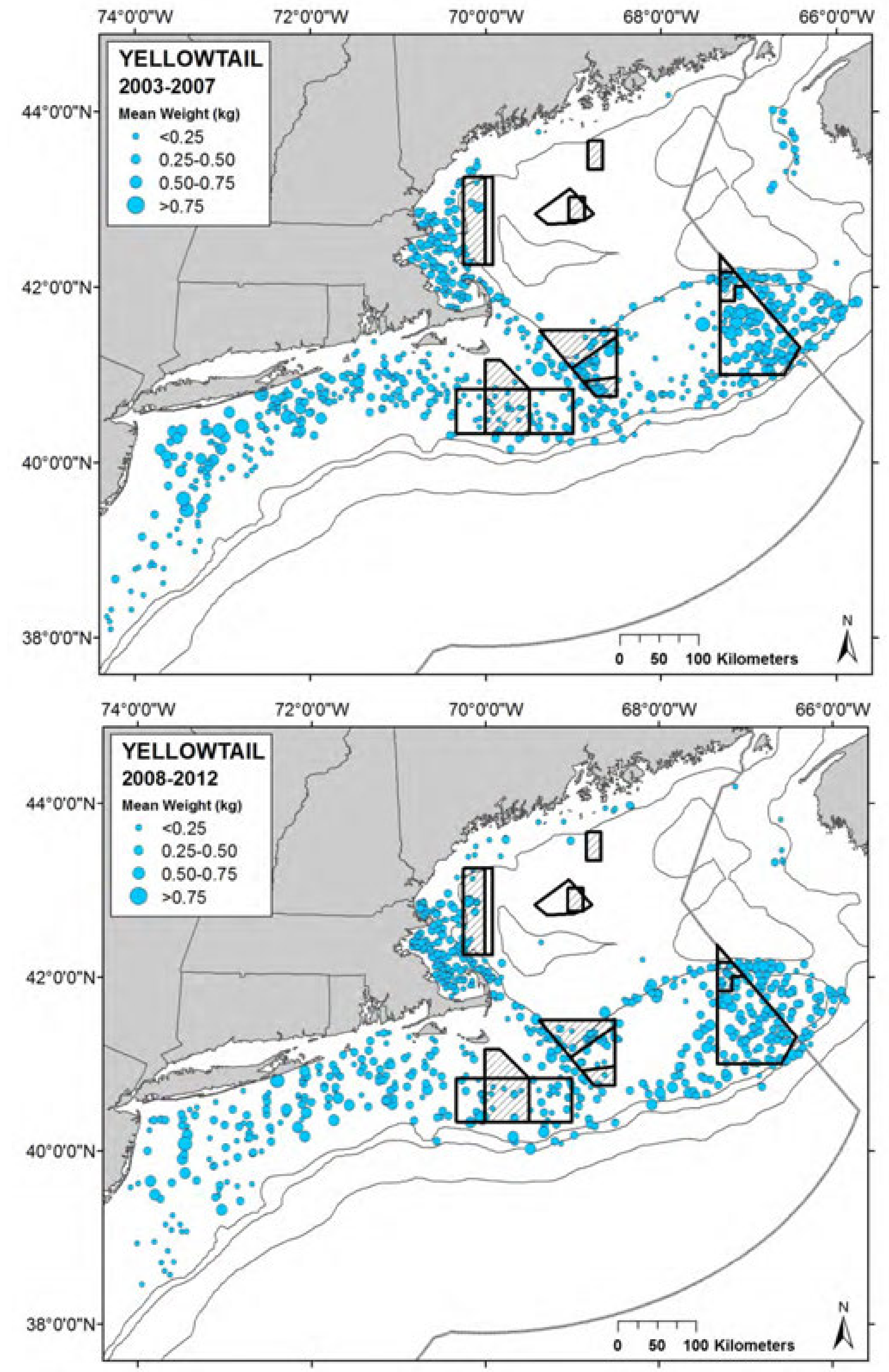


Figure 38. Yellowtail flounder mean weight per tow from survey tows



4.7.1.4.4 Winter flounder

Winter flounder were one of two species (the other being haddock) that were determined by statistical analysis to benefit from year round closed areas on Georges Bank (Kerr et al., 2012). This conclusion is supported in the biological data collected during the spring and fall trawl surveys. Higher proportions of large winter flounder were observed in the Georges Bank proposed sector exemption areas and the current habitat closed areas, during both the spring (Figure 39) and fall (Figure 40) surveys.

Figure 39. Comparative length frequencies of female Georges Bank winter flounder during 2002-2012 spring surveys

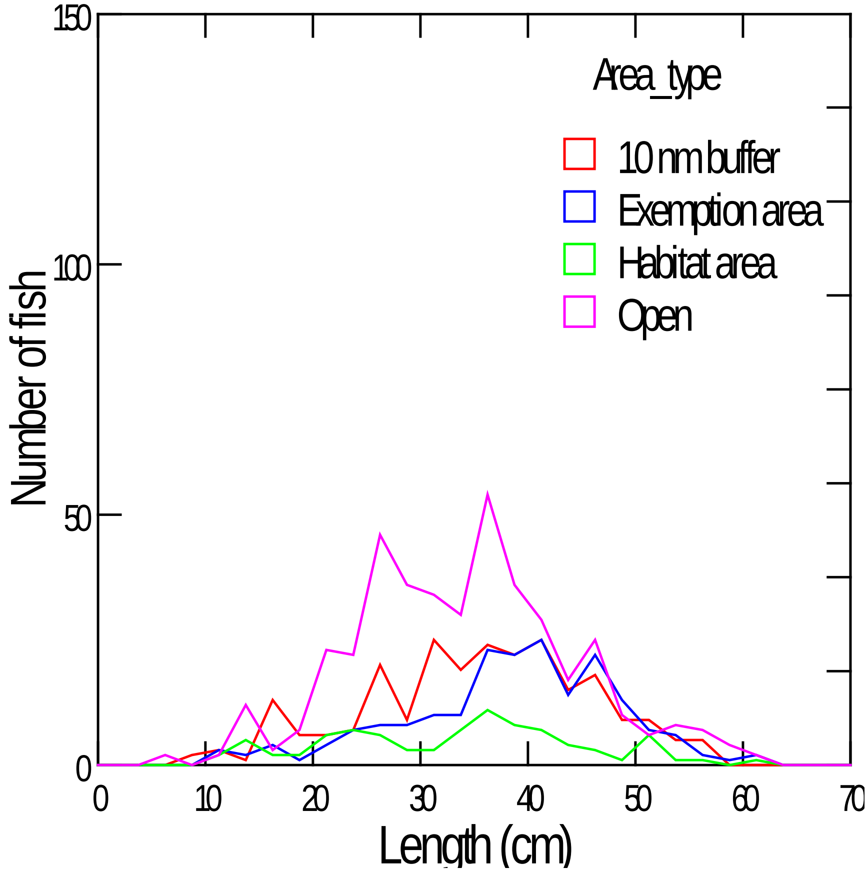
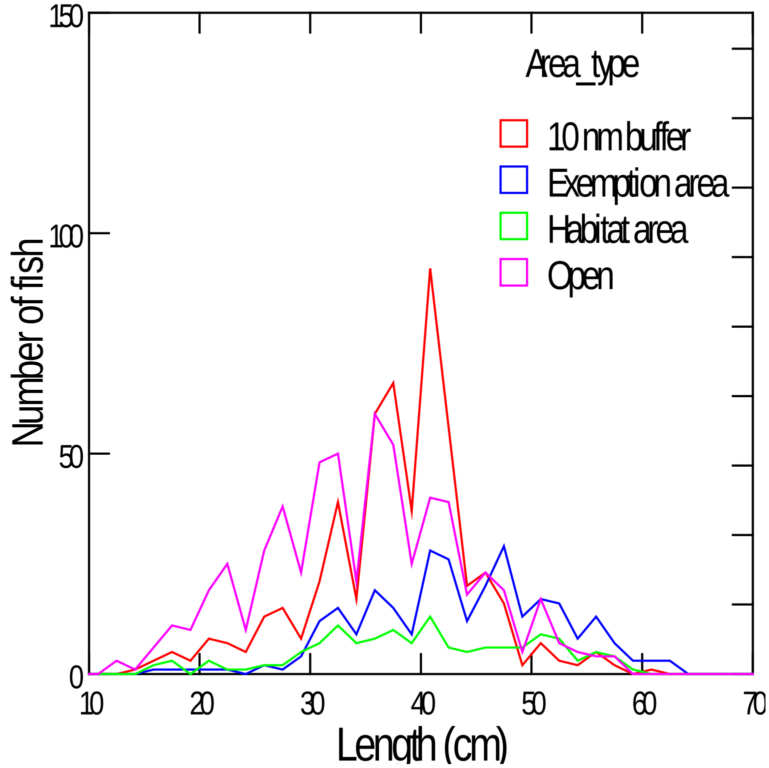


Figure 40. Comparative length frequencies of female Georges Bank winter flounder during 2002-2011 fall surveys



During the spring survey, most of the observed winter flounder were either immature or resting, with most fish occuring in the northern part of Georges Bank, in Massachusetts Bay, in and near the Nantucket Lightship Area, and to a lesser extent in the Great South Channel (Figure 41). More developing winter flounder were observed in the fall survey (Figure 42). Compared to the spring, winter flounder had a similar distribution, with comparatively more fish in the Great South Channel and the sectore exemption area of Closed Area I. Many of the observed developing winter flounder in Closed Area II were in the Cod HAPC.

Figure 41. Geographical distribution of female winter flounder maturity stages during the 2002-2012 spring trawl surveys.

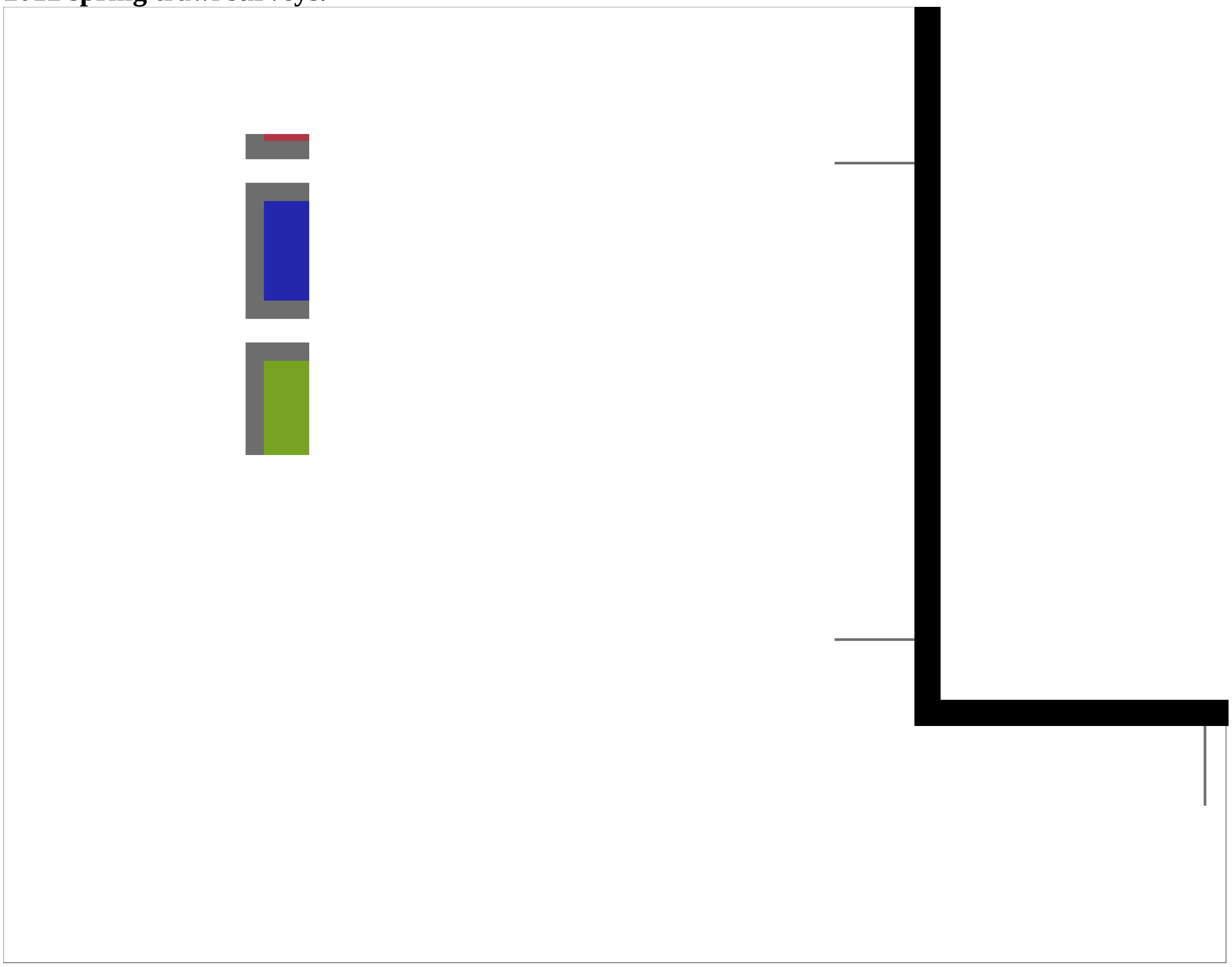
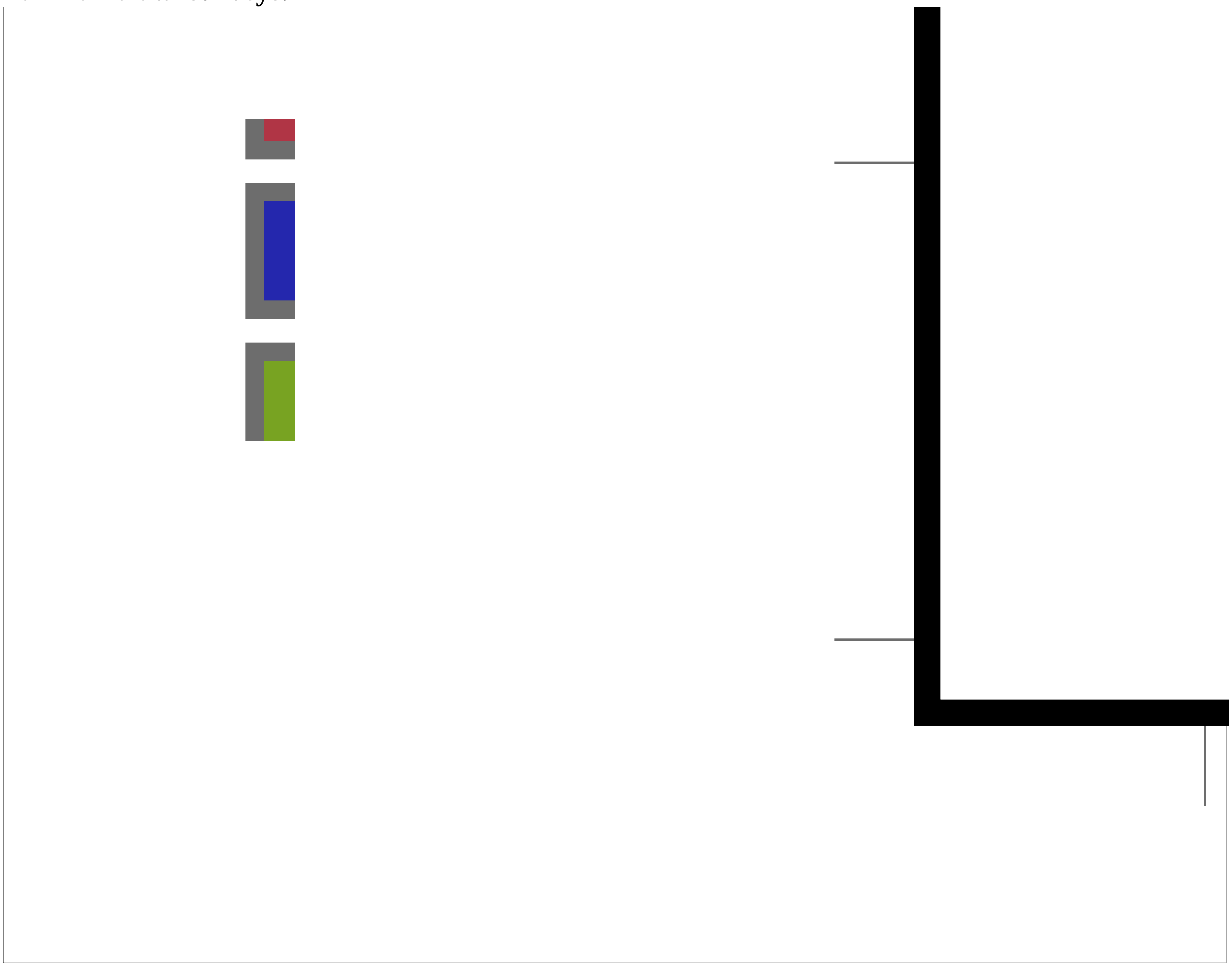
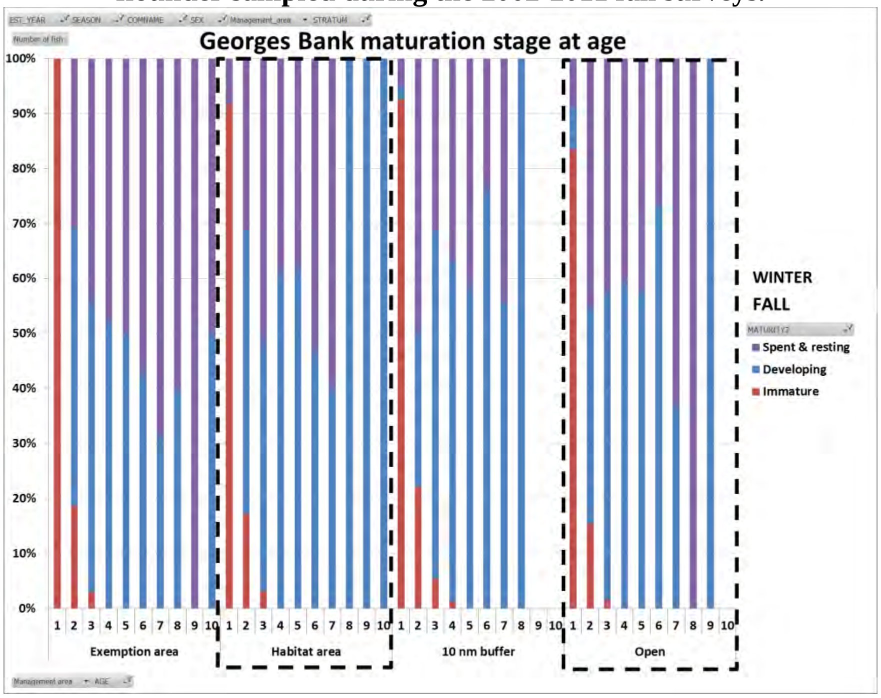


Figure 42. Geographical distribution of female winter flounder maturity stages during the 2002-2011 fall trawl surveys.



Differences of other biological characteristics among types of management areas were unremarkable. Length at ageand maturity at age (Figure 43) were similar among types of management areas in the spring and fall surveys.

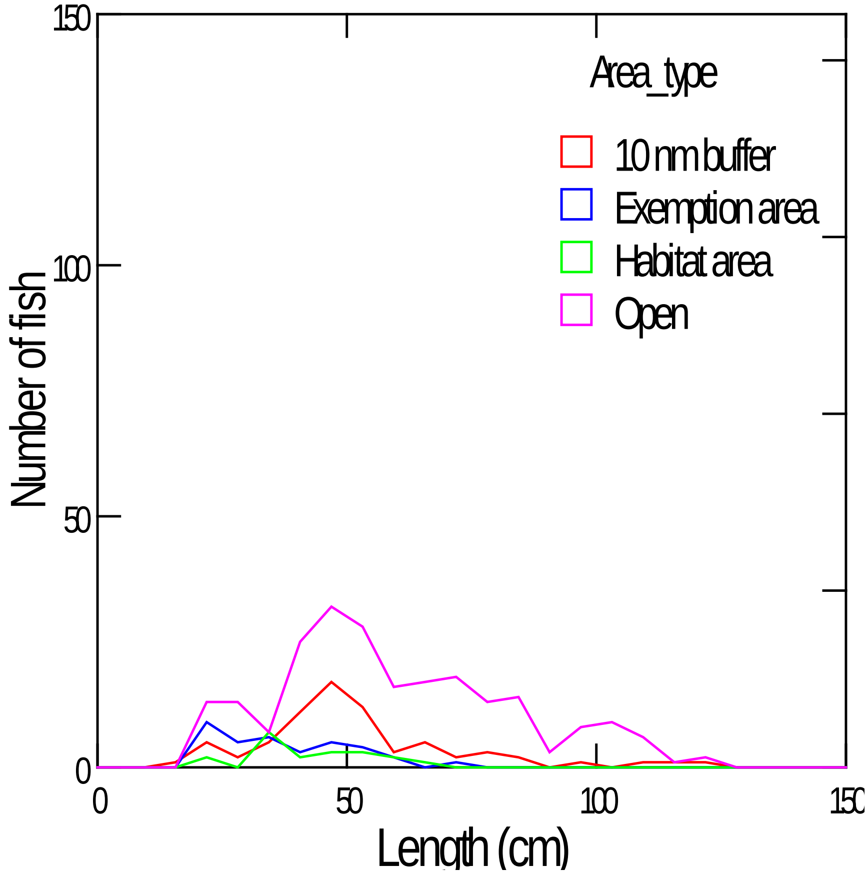
Figure 43. Proportion mature at age by type of management area for female Gulf of Maine winter flounder sampled during the 2002-2011 fall surveys.



4.7.1.4.5 Barndoor skate

Although there has been speculation that the Georges Bank closed areas have contributed to the increase in large barndoor skate in the past 10-15 years, more of the larger barndoor skate were observed in open fishing areas, during both the spring (Figure 44) and fall surveys.

Figure 44. Comparative length frequencies of female Georges Bank barndoor skate during 2002-2012 spring surveys



In the spring survey, barndoor skate catches occurred along the southern margin of Georges Bank and Southern New England (Figure 45). Some additional barndoor skate catches were made north of Closed Area II, in Canada. Smaller barndoor skate appear to occur in the shallower depths found within the Nantucket Lightship Area and Closed Area II proposed sector exemption areas. In the fall, barndoor skate appear to be more widely distributed and in shallower waters of Georges Bank and Southern New England (Figure 46). The smaller barndoor skate occurred in the shallower depths found within the Closed Area I and Closed Area II proposed sector exemption areas.

Figure 45. Geographical distribution of barndoor skate length frequency during 2002-2012 spring surveys.

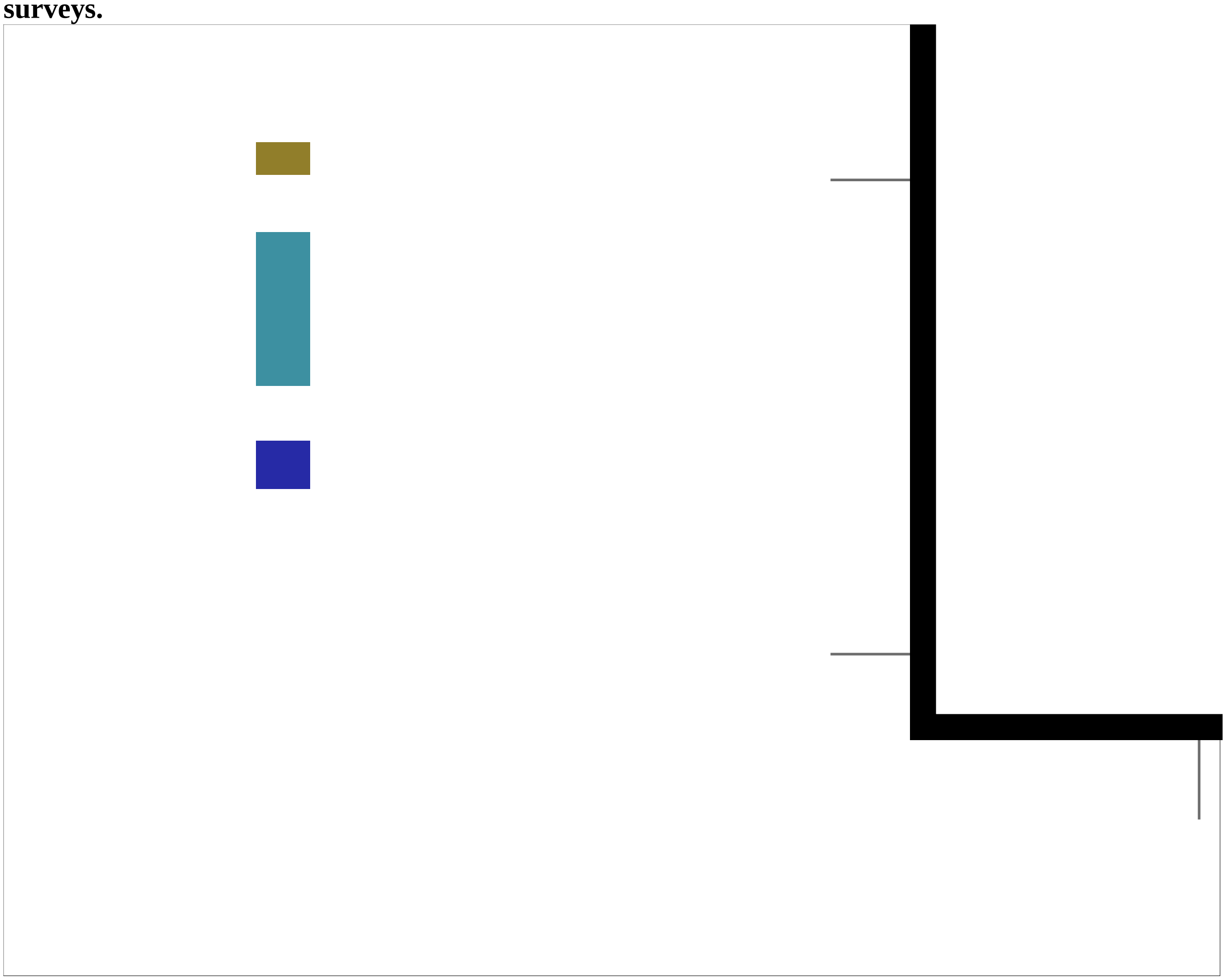
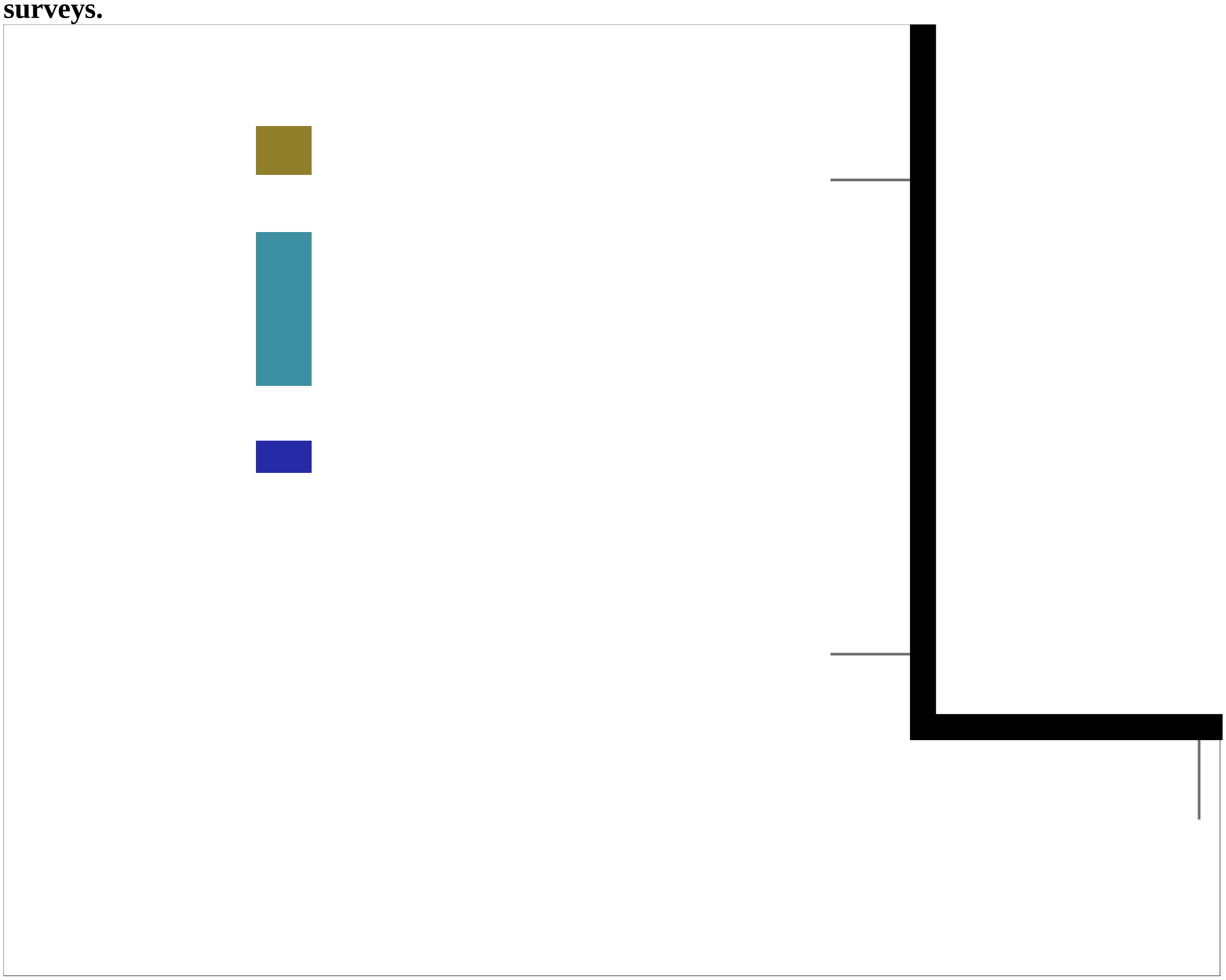
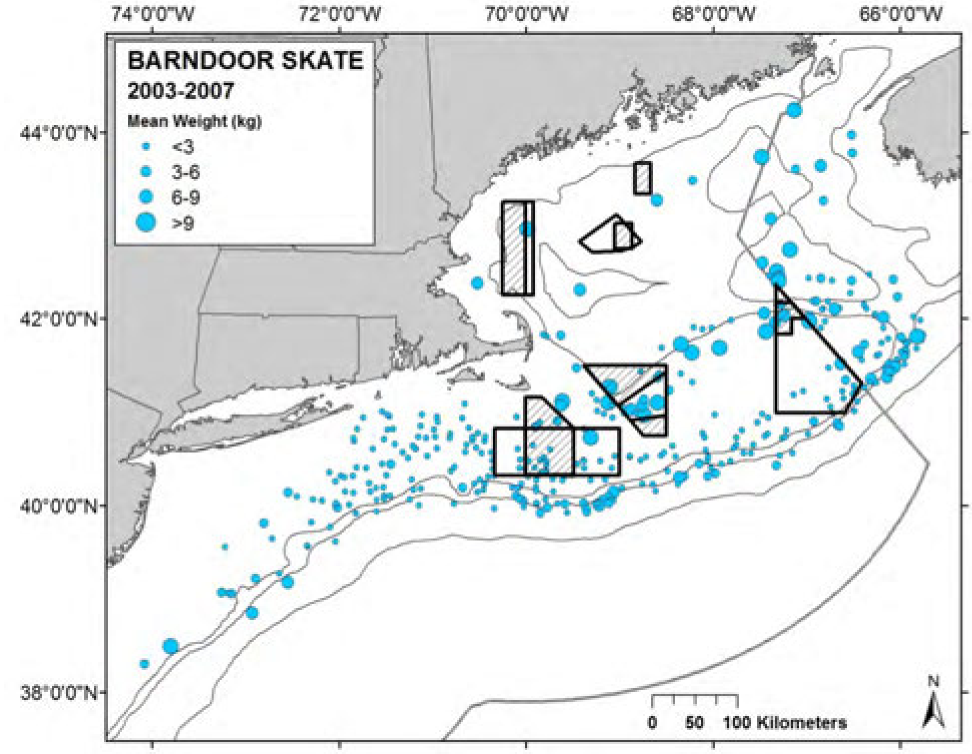


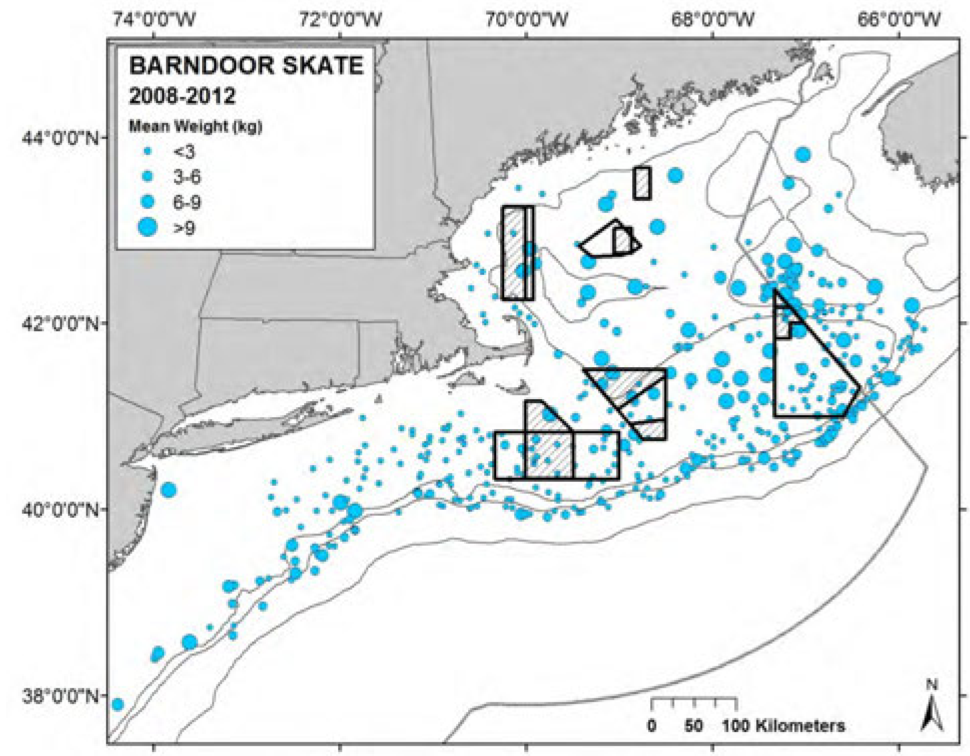
Figure 46. Geographical distribution of barndoor skate length frequency during 2002-2011 fall surveys.



The analysis for mean weight per tow for barndoor skate indicate that most barndoor skates are found on Georges Bank (Figure 47). While survey results from 2003-2007 suggested that larger skates may be residing in Closed Areas, particularly Nantucket Light Ship and Closed Area I, more recent data does not necessarily support that.

Figure 47. Barndoor skate mean weight per tow from survey tows





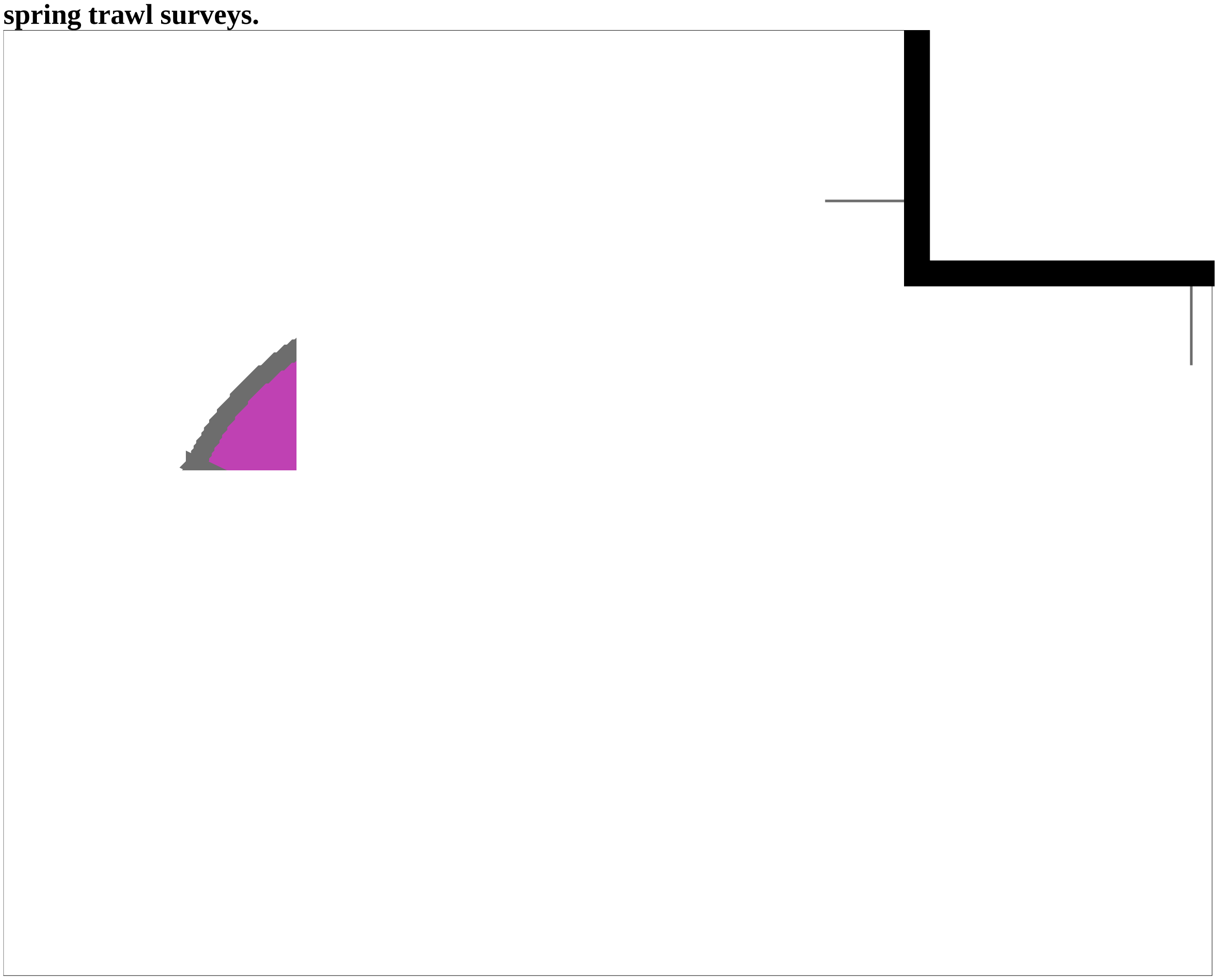
4.7.1.4.6 Smooth Skate

Smooth skate are sparsely caught by the spring and fall surveys throughout the deeper waters of the Gulf of Maine, including some in the Western Gulf of Maine and Cashes Ledge areas, as well as the northern habitat area of Closed Area I and the Cod HAPC and "triangle" proposed sector exemption area of Closed Area II. Differences in length frequencies of skates found in these areas are not observable. Smooth skates are not aged and few maturity observations are available.

4.7.1.4.7 Monkfish

The survey has encountered few monkfish in the proposed sector exemption areas or the exisitng habitat areas of Georges Bank. There have been some monkfish in the Nantucket Lightship Area during the fall (Figure 48) and winter surveys, but most of the monkfish occur in open fishing areas.

Figure 48. Geographical distribution of female monkfish maturity stages during the 2003-2012 spring trawl surveys.



Monkfish occupy a broad area of deep water in the Gulf of Maine, including the Western Gulf of Maine and Cashes Ledge closed areas, but generally the concentrations of monkfish in these areas is not exceptional. The survey encountered a mix of developing and immature monkfish in the central Gulf of Maine. Otherwise the monkfish biological characteristics (weight-length, length at age, maturity) are unremarkable. Survey data indicates heavier concentrations of monkfish in the western and central Gulf of Maine as well as along the edge of the outer continental shelf in southern New England (Figure 50). There were larger monkfish present in the closed areas, but it does not appear to be substantially more than in the open areas (Figure 51).

Figure 49. Geographical distribution of female monkfish maturity stages during the 2002-2011 fall trawl surveys.

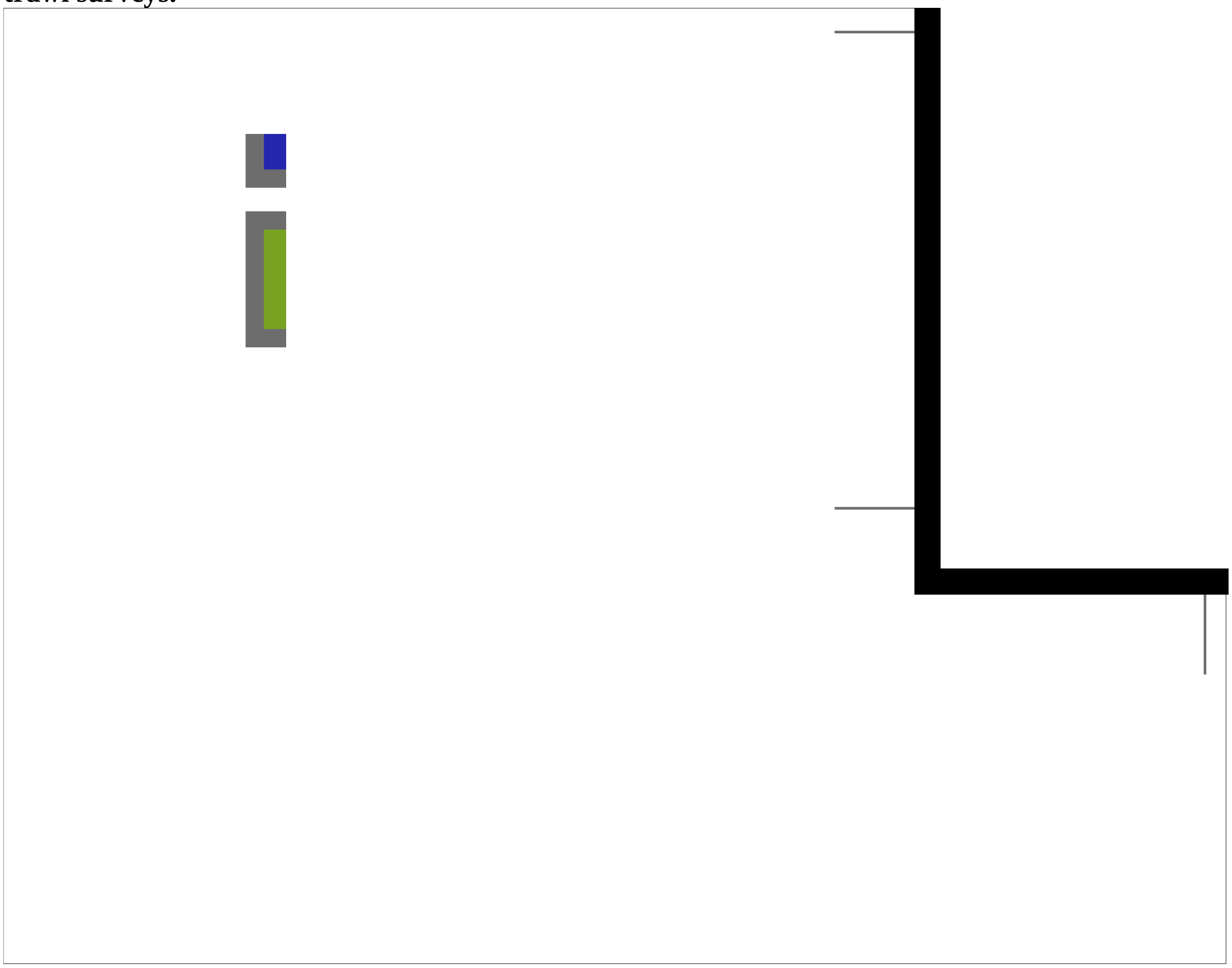
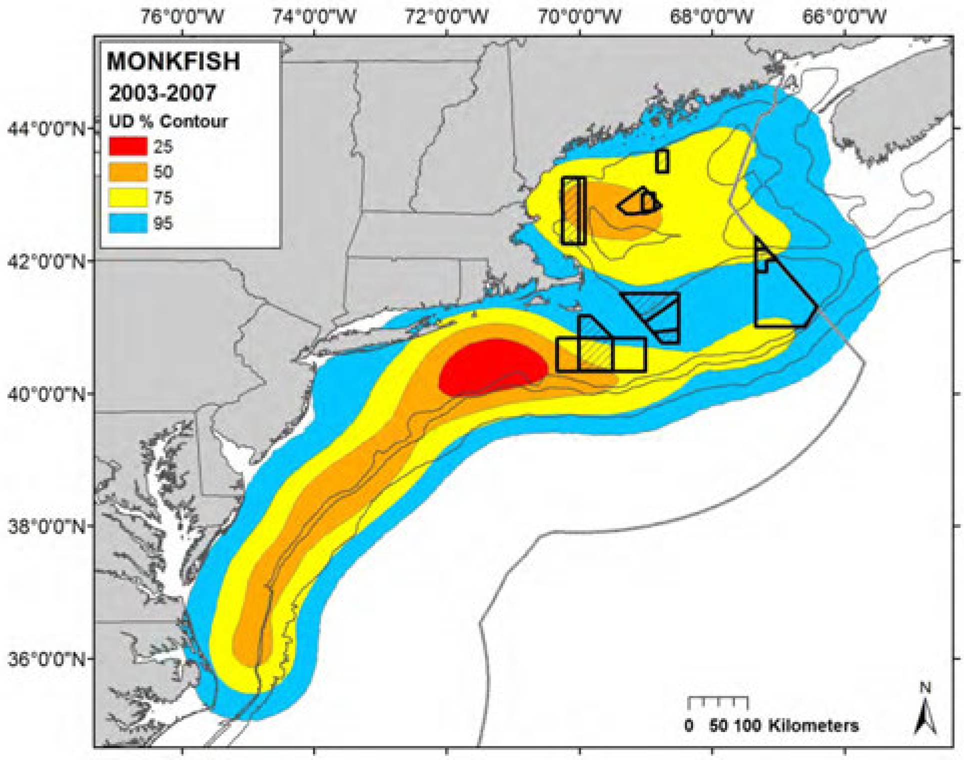


Figure 50. Monkfish distribution maps from survey tows



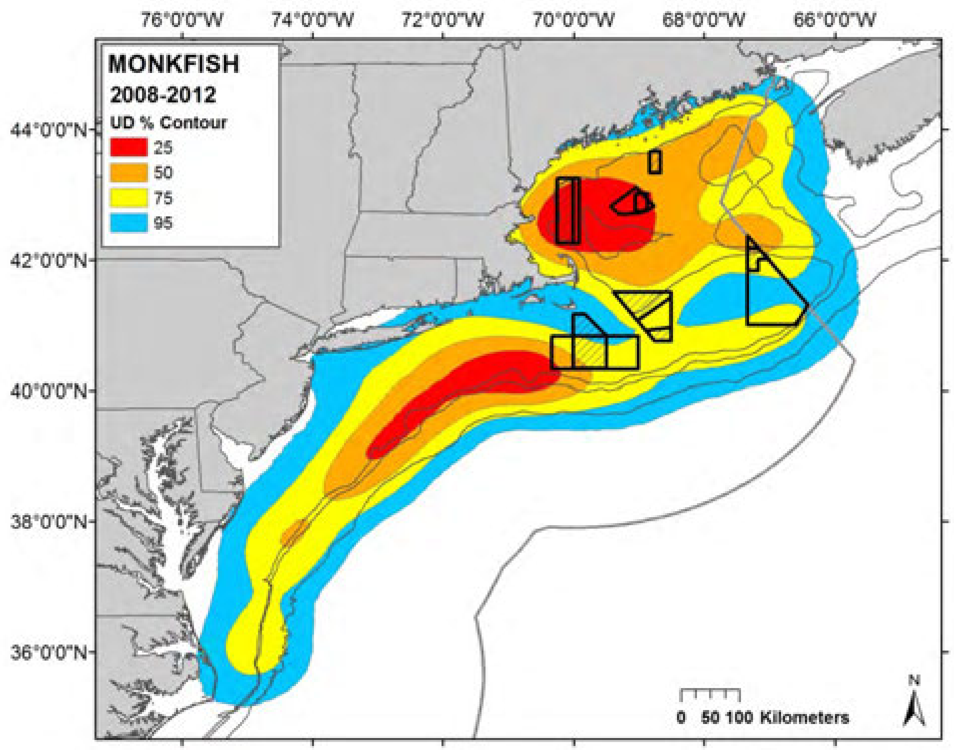
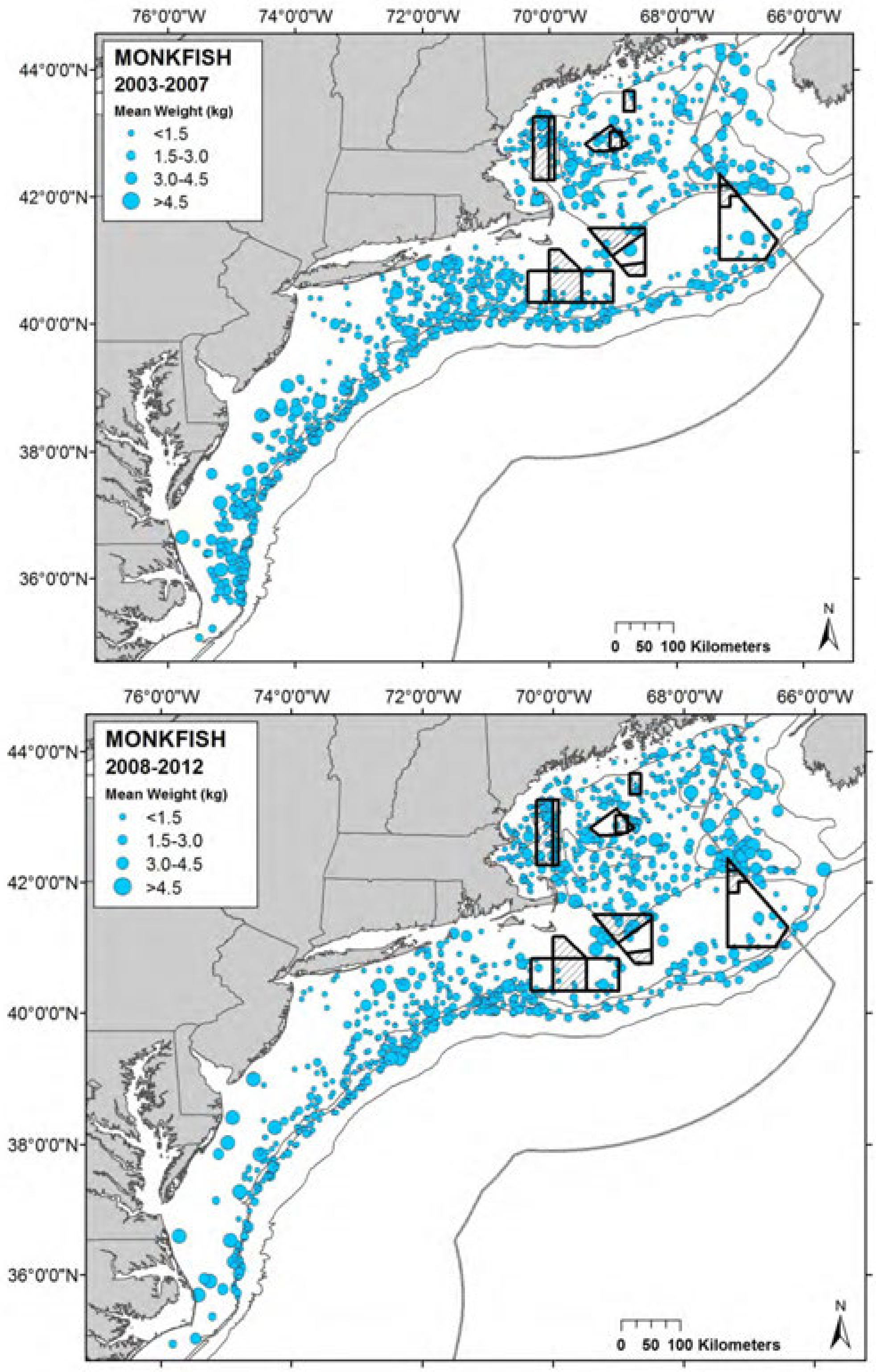


Figure 51. Monkfish mean weight per tow from survey tows



4.7.1.4.8 White Hake

In addition to the SE edge of Georges Bank (outside of the year round groundfish closed areas) and relatively few white hake inside of the Western Gulf of Maine, Cashes Ledge and Jeffries Bank closed areas, most white hake in the spring survey are caught offshore (Figure 52). Concentrations of large female white hake are apparent SE and S of the Western Gulf of Maine and Cashes Ledge Areas. High concentrations of large female white hake are also seen just north of Closed Area II, outside of the "triangle" that would become a proposed sector exemption area. Few developing fish were observed in the Gulf of Maine closed areas and if anything the larger female white hake were caught by the survey in open fishing areas. Some developing females were observed north of Closed Area II.

The female white hake distribution is more spread out into shallower waters in the fall, with more large resting females caught by the fall survey in the Western Gulf of Maine area, including the proposed sector exemption areas, and in the Cashes Ledge closed area (Figure 53). Smaller, immature white hake are prevalent in the shallower coastal areas of the Gulf of Maine. The maturity of female white hake in the habitat and proposed sector exemption areas is affected by the length-frequency of white hake in these areas. White hake tend to be somewhat larger at age inside the habitat and proposed sector exemption areas of the Gulf of Maine than in open fishing areas, but this difference may not be statistically significant.

Figure 52. Geographical distribution of white hake length frequency during 2002-2012 spring surveys.

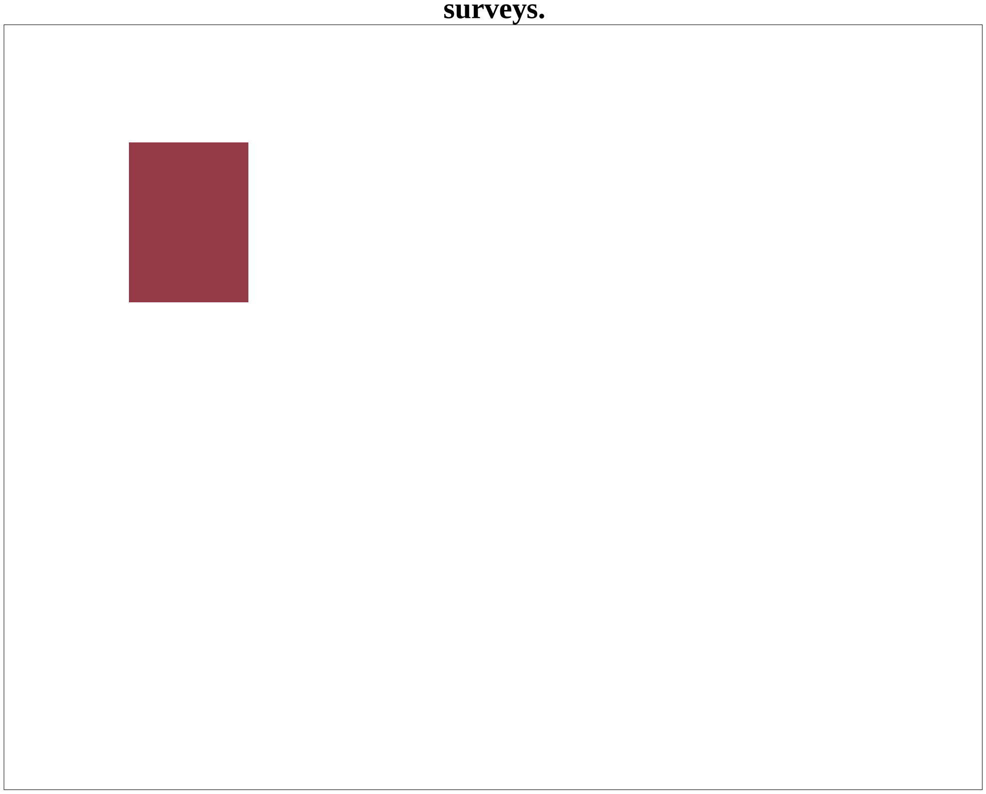
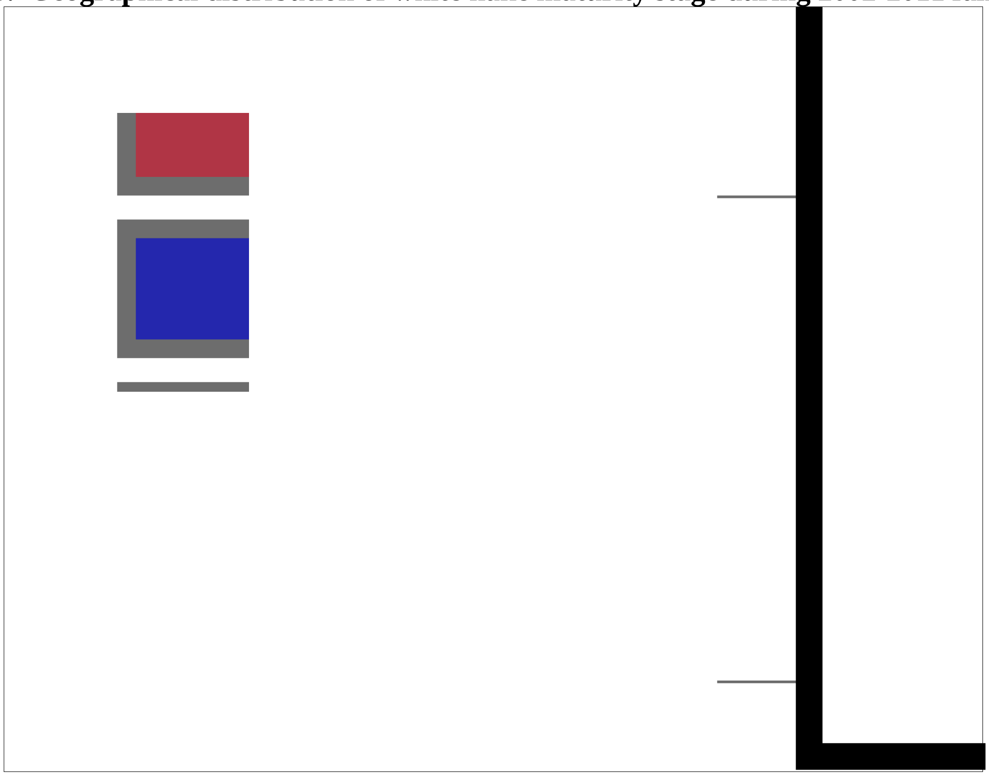


Figure 53. Geographical distribution of white hake maturity stage during 2002-2011 fall surveys.



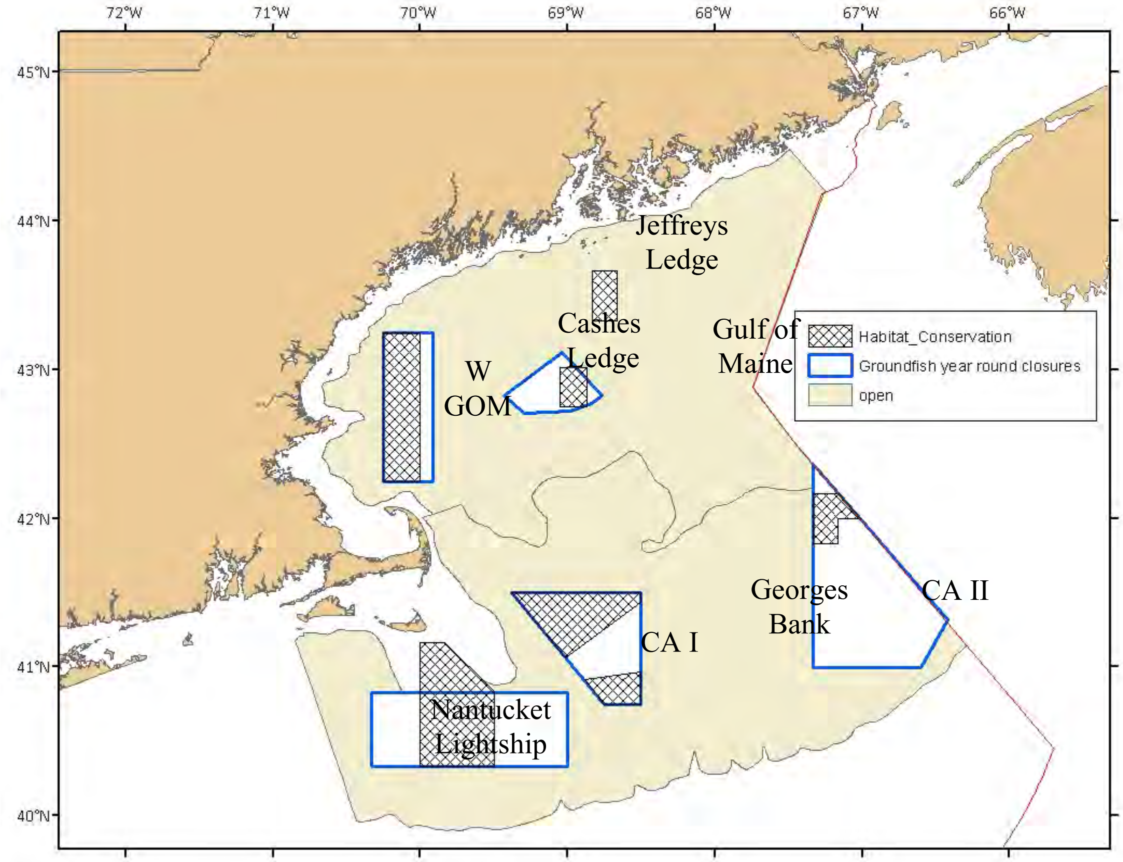
4.7.2 Swept Area Indices and Proportion of Biomass Inside and Outside of Closed Areas

4.7.2.1 Methods

The FW 48 EA analyzed Northeast Fisheries Science Center (NEFSC) bottom trawl surveys to determine swept-area biomass (kg/tow) and abundance (number/tow) indices for 15 groundfish species, 7 skate species and monkfish. Swept-area estimates were analyzed individually for each of 5 year-round groundfish closed areas (Nantucket Lightship Area, Closed Area I, Closed Area II, Cashes Ledge, and Western Gulf of Maine area), 7 habitat conservation areas (NLCA Hab, CAI Hab N, CAI Hab S, CA II Hab, WGOM Hab, Cashes Hab, and Jeffreys Ledge) as well as two open areas: Georges Bank and Gulf of Maine (see figure below). Data was aggregated across the years 2005-2011 in order to include sufficient data to estimate mean swept-area biomass inside and outside of each closed area by species and by spring and fall surveys.

While this analyses includes all the closed area and essential fish habitat areas, this action is only considering opening the mortality-closure portions of Closed Area I, II, and the Nantucket Lightship Closed Area. As discussed in the results below, there are large variances in the mean biomass and abundance estimates for each individual area for most species. Further, there were only substantial differences in biomass and CPUE for a few stocks and closed areas. Due to these reasons, and because the entire analysis is available for review in FW 48, only analyses for a few species are included in this EA. For additional information, see FW 48.

Figure 54. Map detailing groundfish year round closures and habitat conservation areas



Mean swept-area biomass and abundance indices were expanded to total mean biomass (B) for each closed or open area using the following equation:

EQ. 1. $$B = \left(\frac{I}{q}\right)\left(\frac{A}{a}\right)$$

Where I is the average swept-area biomass index for an area (kg/tow), q is the catchability coefficient (set to 1, assuming little herding affect outside of the bridal sweep of the survey bottom trawl net), A is the area of a closed or open area (km^2), and a is the swept area of the bottom trawl gear during a standard R/V Albatross tow (0.0384 km^2). The areas for each closed area as well as the expansion of A/a are below:

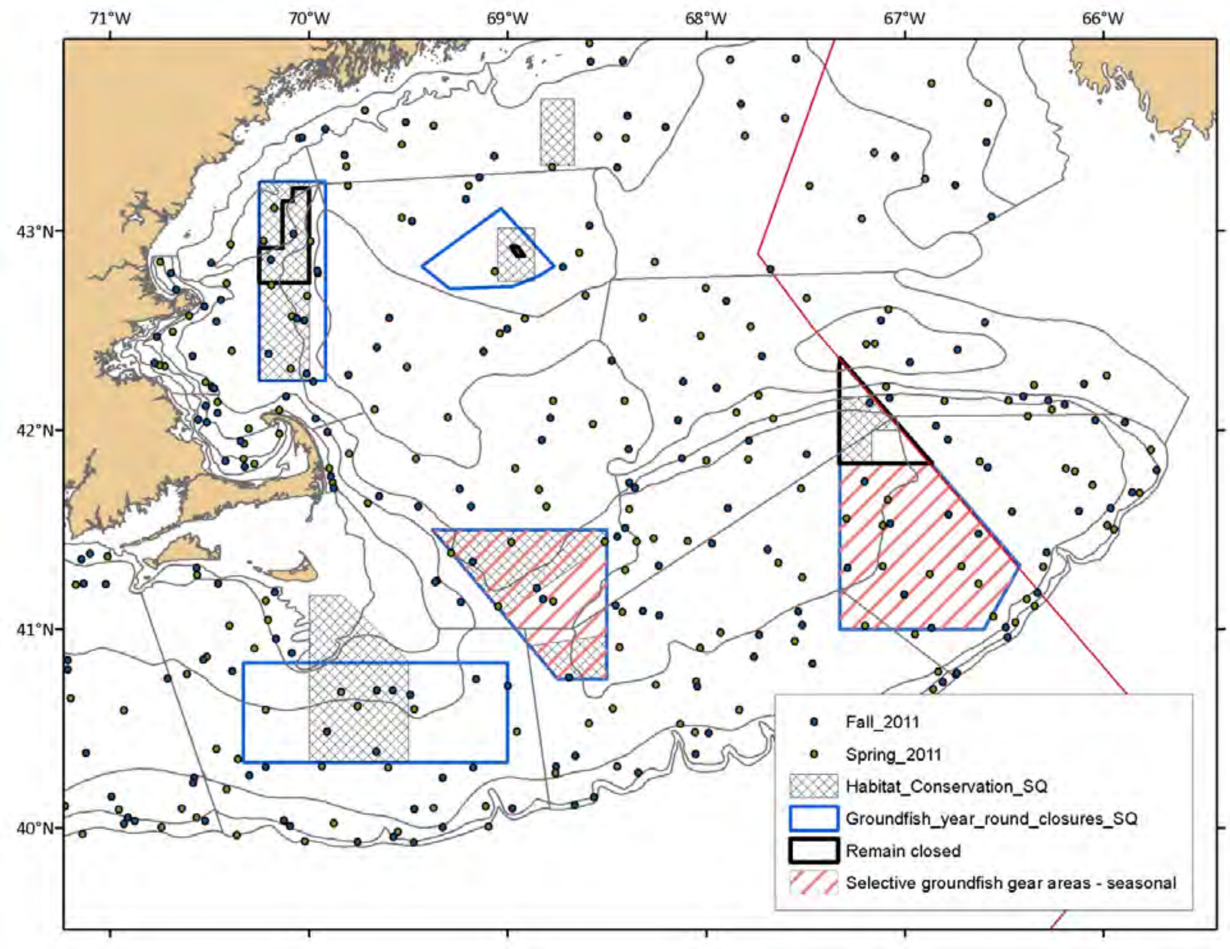
Name	Area (km^2)	A/a
Cashes Ledge CA	1373.07	35757.03
Closed Area I	3938.98	102577.60
Closed Area II	6862.19	178702.86
Nantucket Lightship CA	6247.79	162702.86
Western Gulf of Maine CA	3029.63	78896.61
CAI North	1937.35	50451.82
CAI South	583.68	15200.00
CAII Hab	641.44	16704.17
Cashes Ledge Hab	443.34	11545.31
Jefferys Ledge Hab	498.80	12989.58
Nantucket Lightship Hab	3386.81	88198.18
Western Gulf of Maine Hab	2272.28	59173.96
Georges Bank Open	79490.30	2070059.90
Gulf of Maine Open	80997.94	2109321.35

The analyses resulted in two outputs. First was mean NEFSC bottom trawl survey biomass and abundance indices (survey CPUEs) from each of the closed and open areas, with variance estimates. The second output was total swept-area biomass and abundance estimates, as expanded above from the spring and fall surveys. A ratio of mean biomass inside each closed area to the mean biomass in the corresponding open area was then calculated for each species.

4.7.2.2 Results

NEFSC bottom trawl surveys were randomly distributed across the Georges Bank and Gulf of Maine areas, however the small areas of Cashes Ledge and Jeffreys Ledge closed areas and numerous habitat closed areas resulted in few tows annually (see 2011 example map below). Again, because these analyses compared year round closed areas and essential fish habitat closures, the results include data from areas that are not being considered in this EA (i.e., WGOM closed area).

Figure 55. 2011 NEFSC bottom trawl surveys



The number of stations that were conducted in each area between 2005 and 2011 are summarized in the following table:

Table 59. Number of stations conducted in each area between 2005 and 2011

		n=860	
Spring	**Closed**	**Habitat**	**Open**
Cashes Ledge	7	3	
Closed Area I	36	15/3	
Closed Area II	67	7	
Nantucket Lightship	30	15	
Western Gulf of Maine	37	30	
Jefferys Ledge		2	
Georges Bank			402
Gulf of Maine			277

		n=840	
Fall	**Closed**	**Habitat**	**Open**
Cashes Ledge	8	3	
Closed Area I	27	12/4	
Closed Area II	73	5	
Nantucket Lightship	49	20	
Western Gulf of Maine	40	30	
Jefferys Ledge		3	
Georges Bank			382
Gulf of Maine			254

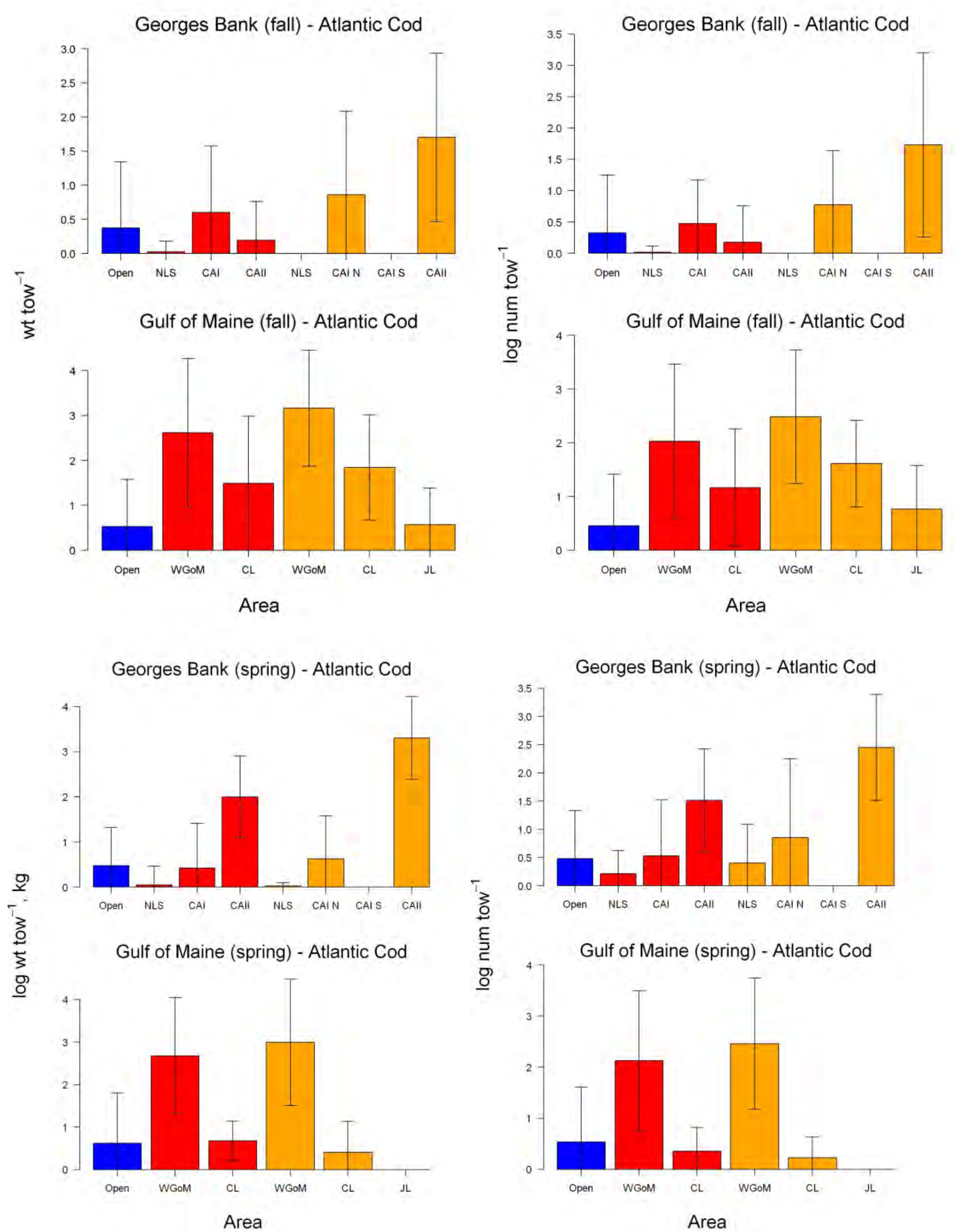
NEFSC survey CPUE in terms of mean biomass (kg/tow) and abundance (number/tow) indices were often higher in closed areas than open, although variance was high, particularly in smaller closed areas and habitat areas. Blue bars represent open areas, red bars represent closed areas and orange bars represent habitat conservation areas. No data were available for clearnose skate. Very little difference in trend was seen between biomass and abundance indices since these were averaged over 2005 to 2011 (see plots below).

4.7.2.3 Conclusions

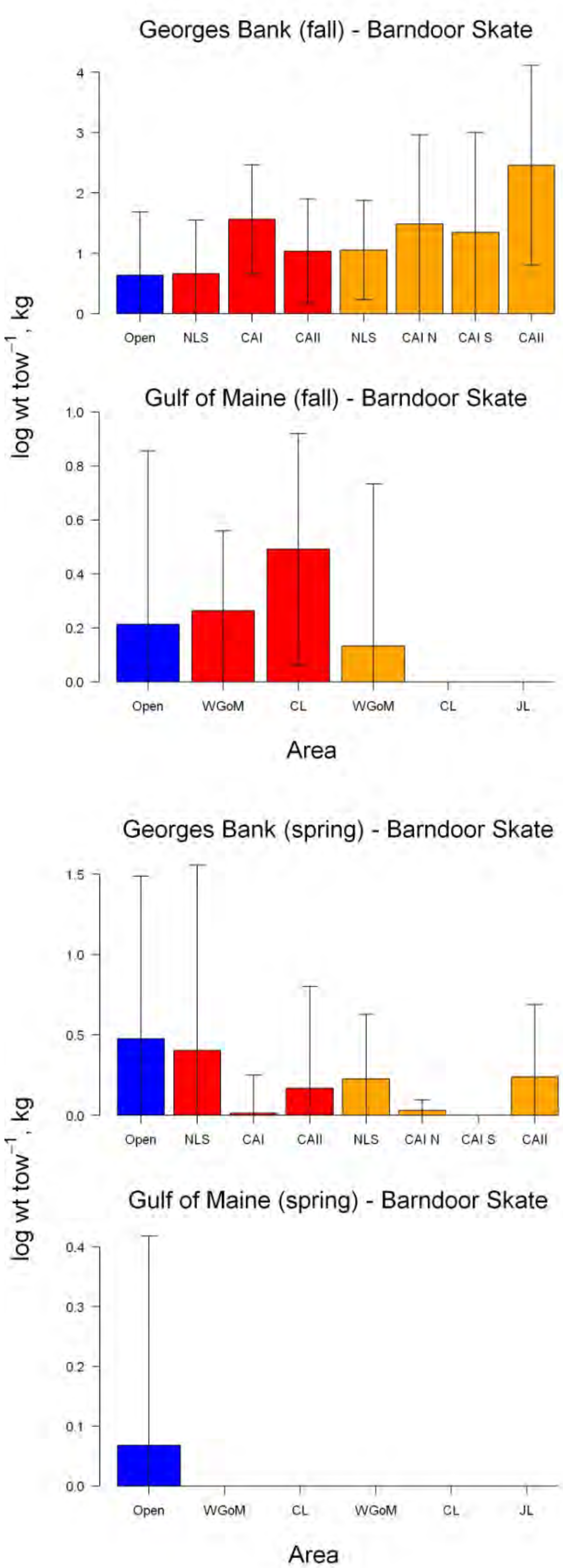
In general, the large variance in the analyses make it difficult to make any type of conclusions with confidence. There are, however, a few substantial differences that are worth noting. Georges Bank cod, Haddock, and Georges Bank yellowtail flounder are all found in much greater quantities in Closed Area II and the Closed Area II habitat closure than any other area. In addition, GB cod and haddock are very prevalent in Closed Area II and the Closed Area II habitat closure in the fall as well. This suggests that large amounts of haddock, cod, and yellowtail flounder can be harvested from Closed Area II. This supports the original intent of opening Closed Area II, which was increasing access to haddock. This does create some concern though, as accessing Closed Area II could result in increased catches of GB cod and GB yellowtail flounder, stocks that are both subject to overfishing and overfished. Smaller allocations of these stocks, which are so numerous in the area, could limit the ability for sector vessels to target the healthier GB haddock stock.

Figure 56. Mean Biomass CPUE Index and Abundance CPUE Index 2005-2011

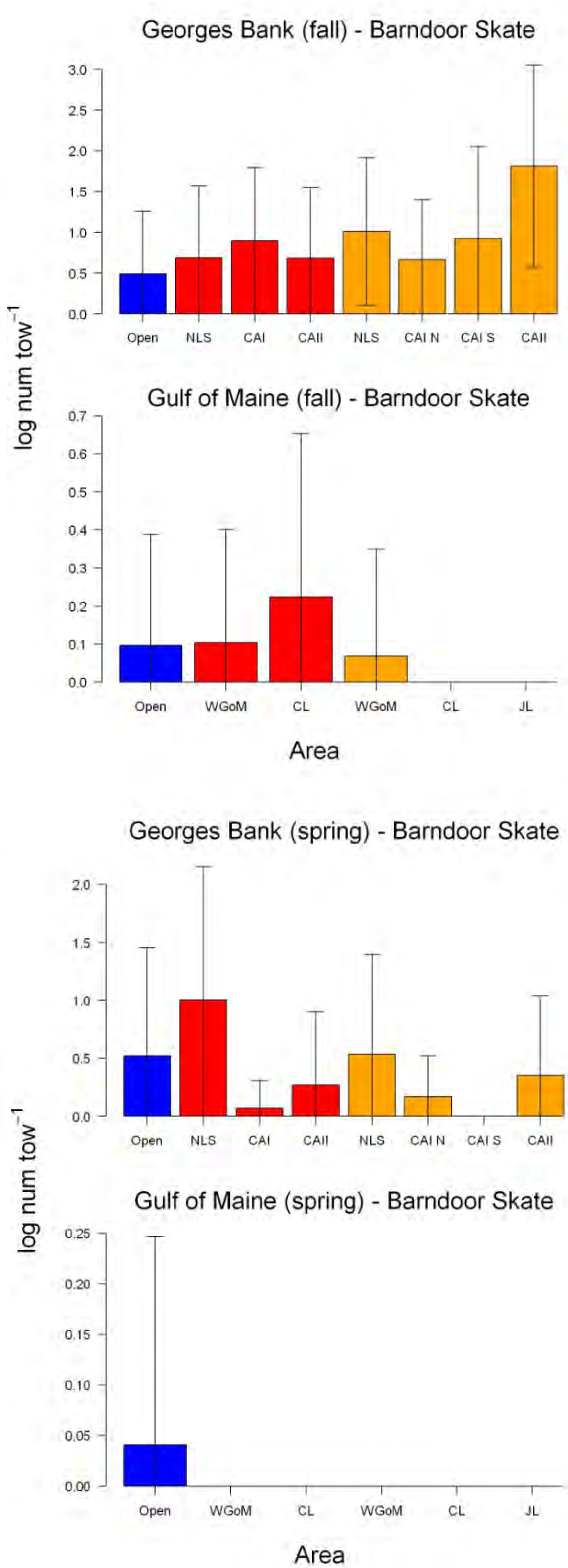
Mean Biomass CPUE Index 2005-2011 Mean Abundance CPUE Index 2005-2011



Mean Biomass CPUE Index 2005-2011

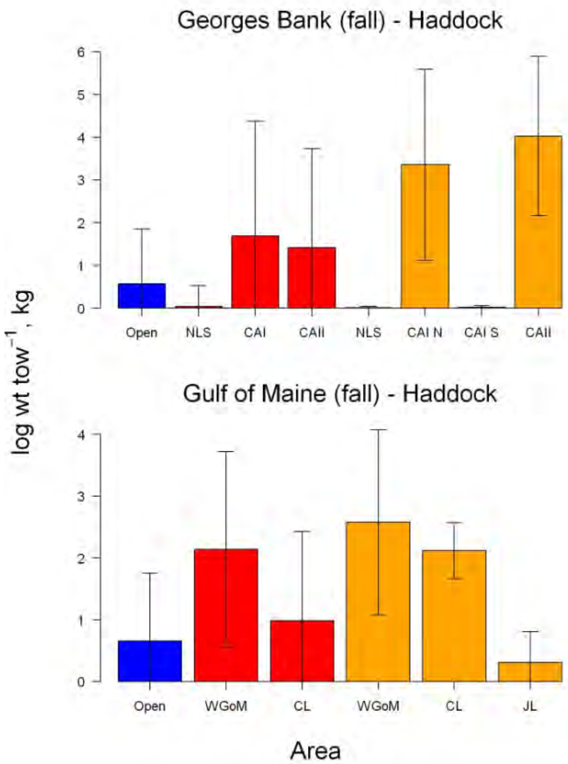


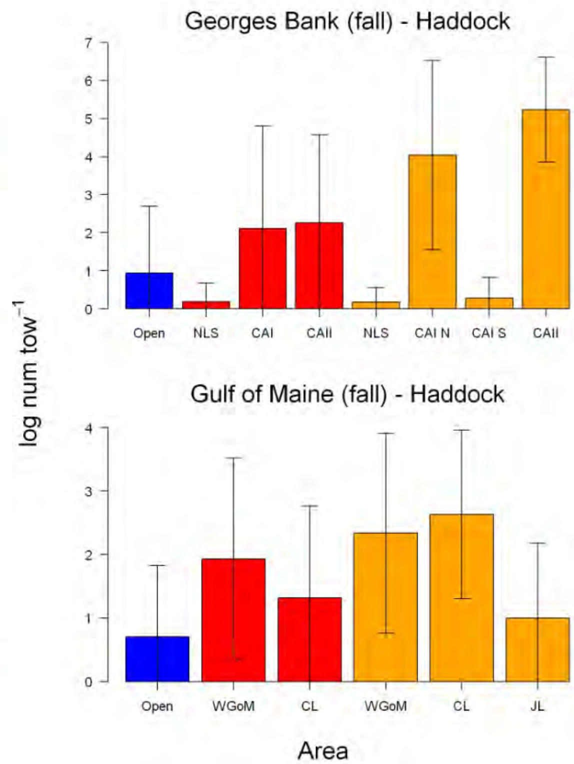
Mean Abundance CPUE Index 2005-2011

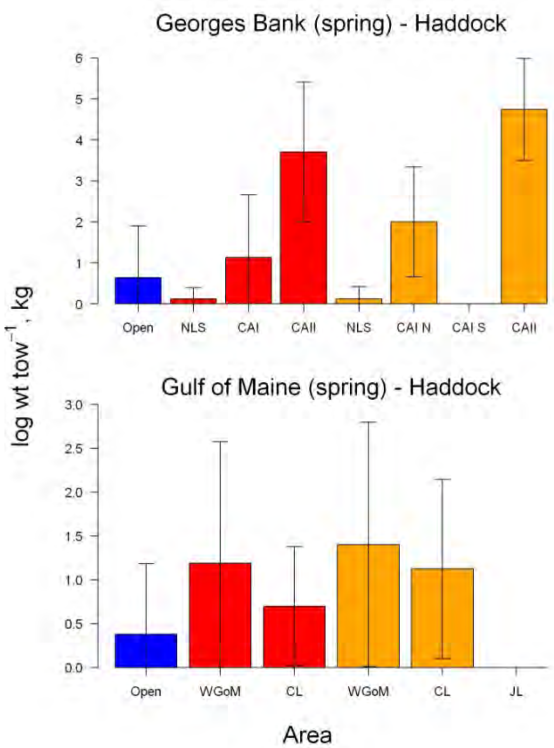


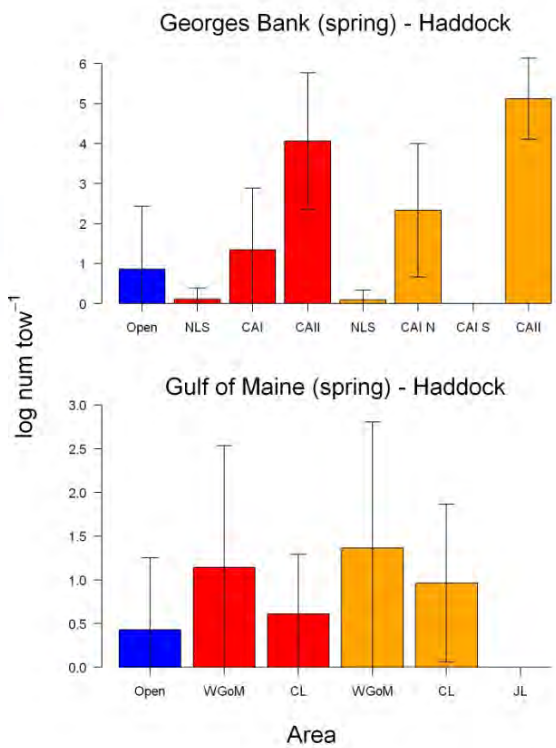
Mean Biomass CPUE Index 2005-2011

Mean Abundance CPUE Index 2005-2011



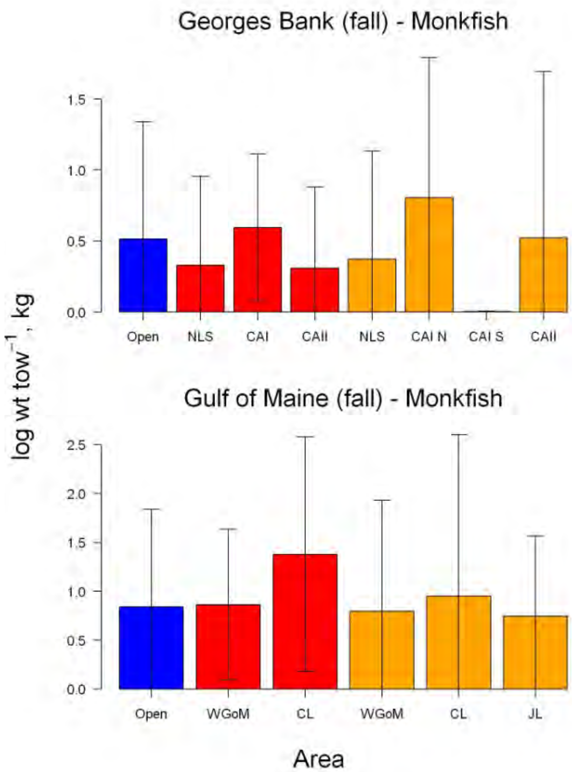


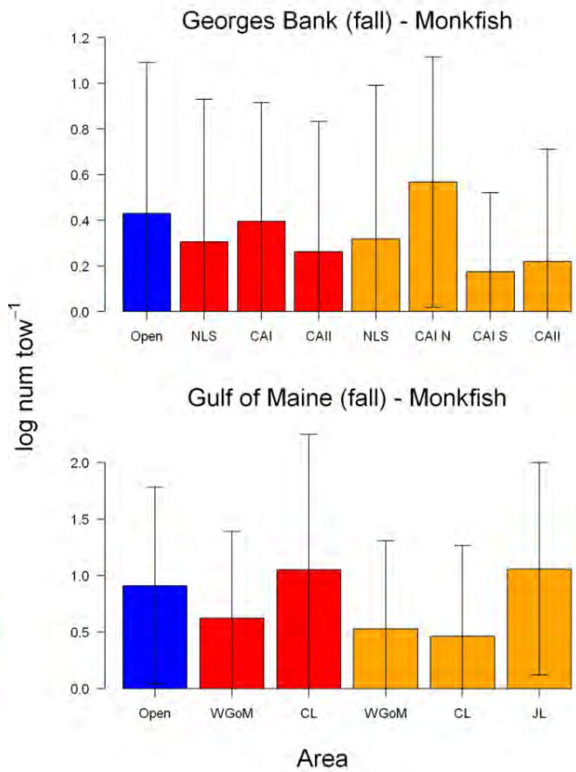


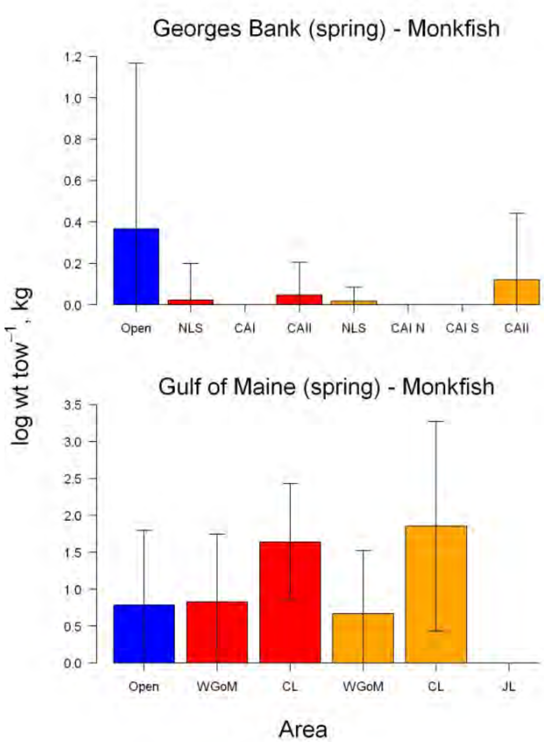


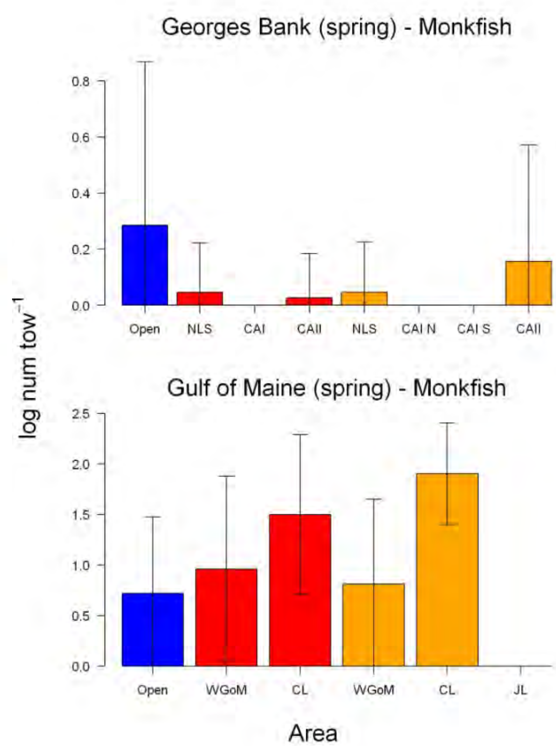
Mean Biomass CPUE Index 2005-2011

Mean Abundance CPUE Index 2005-2011

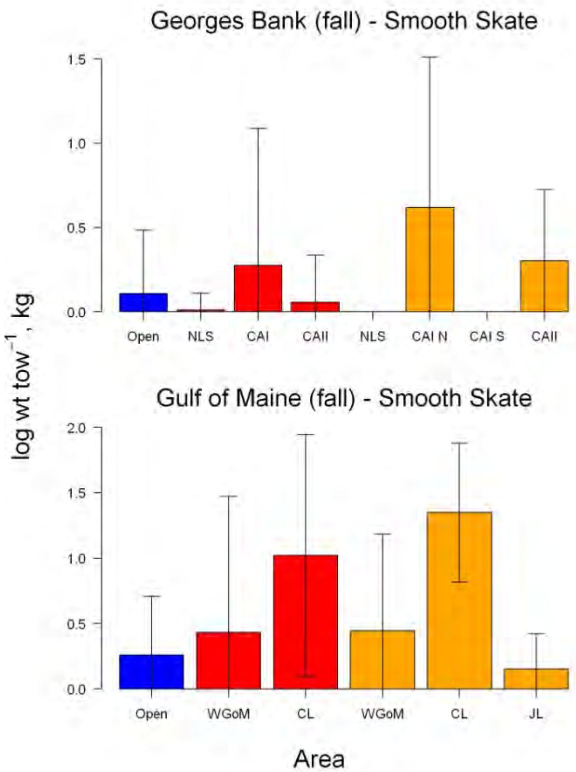


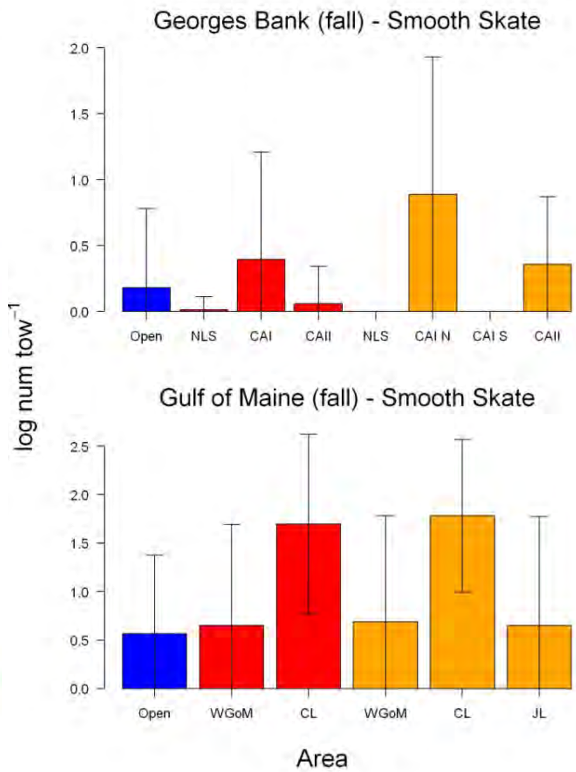


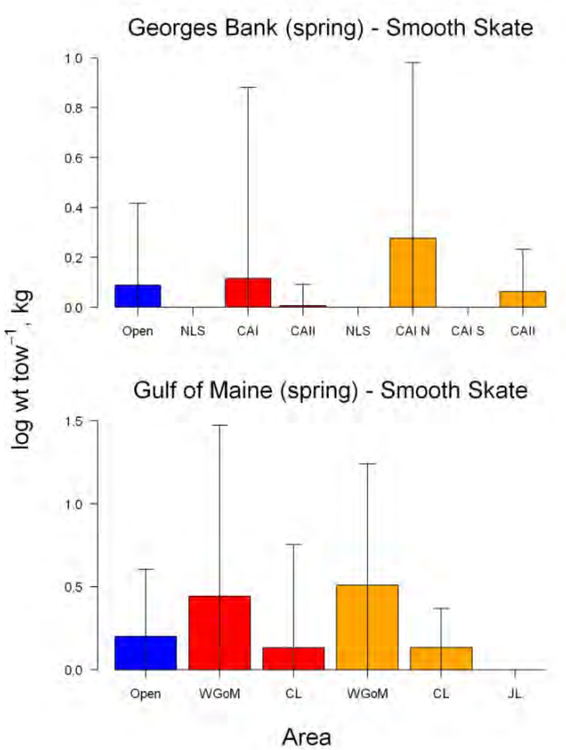


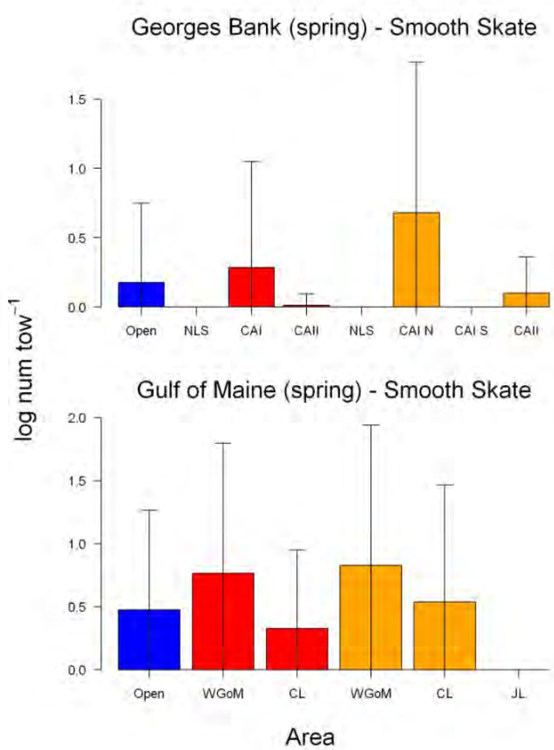


Mean Biomass CPUE Index 2005-2011 Mean Abundance CPUE Index 2005-2011



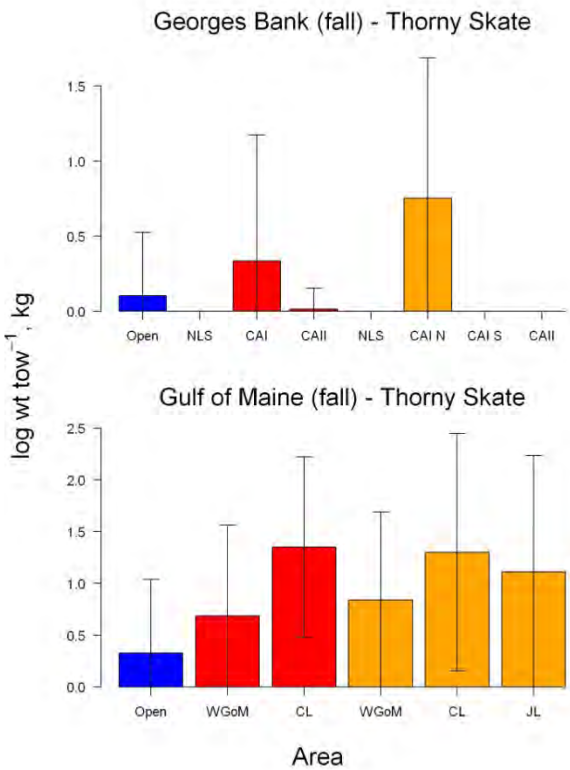


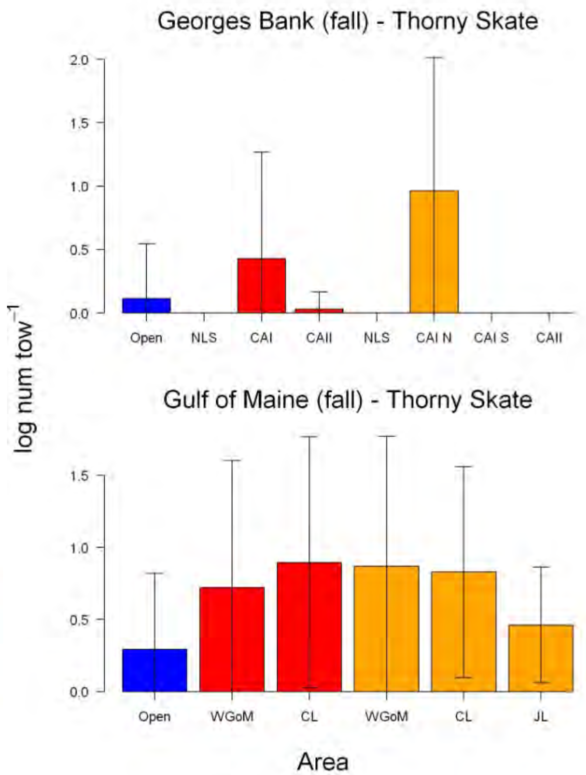


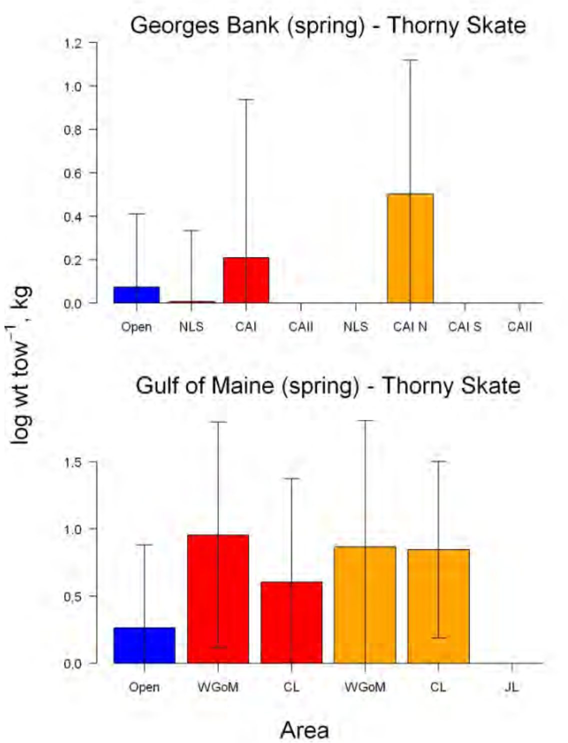


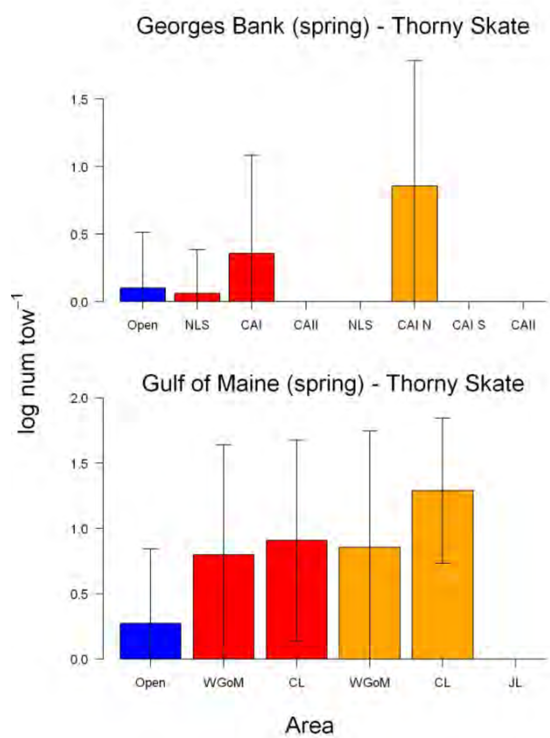
Mean Biomass CPUE Index 2005-2011

Mean Abundance CPUE Index 2005-2011

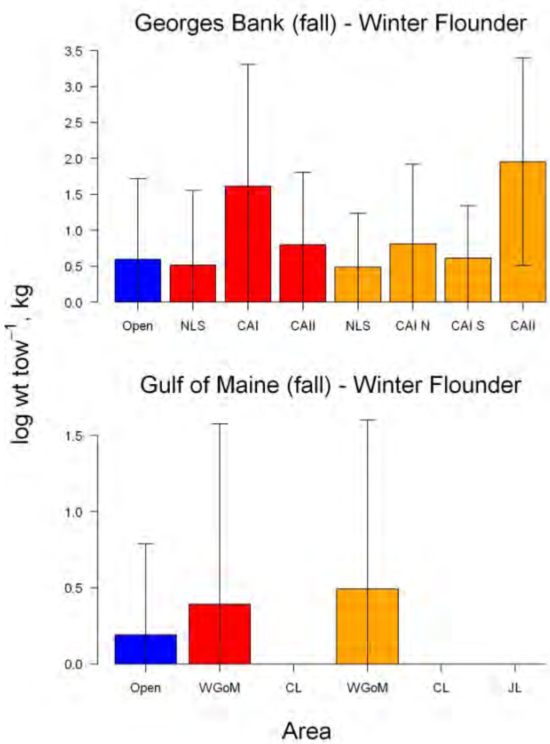


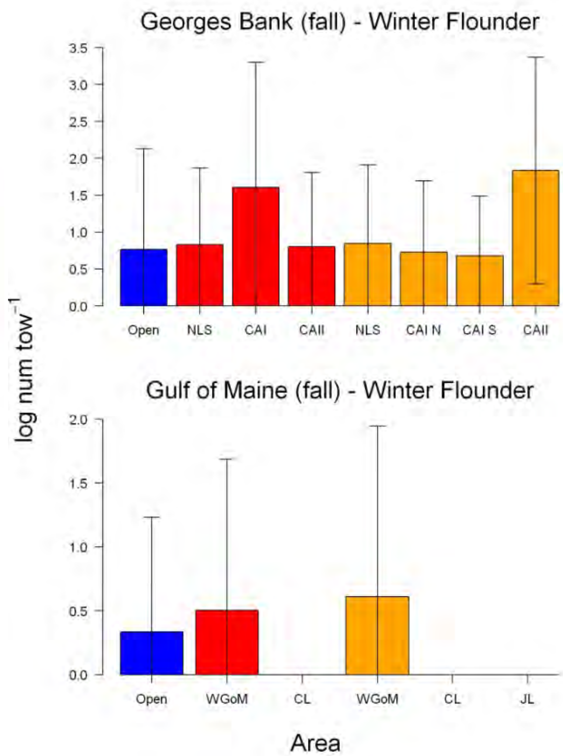


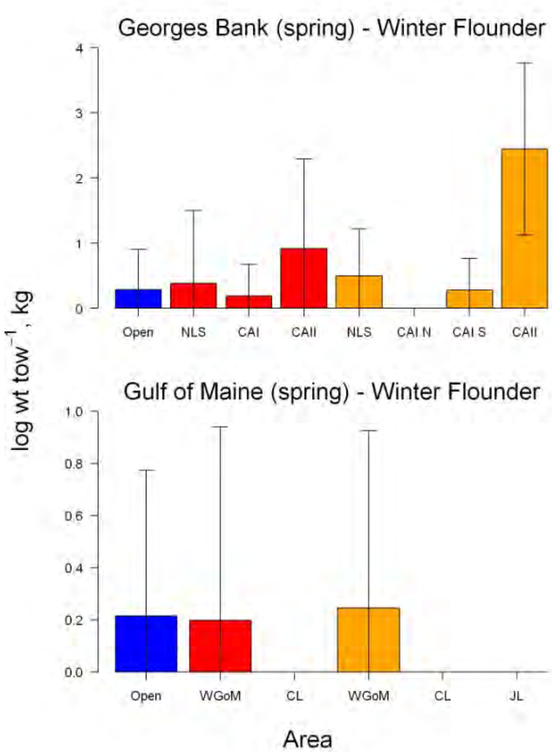


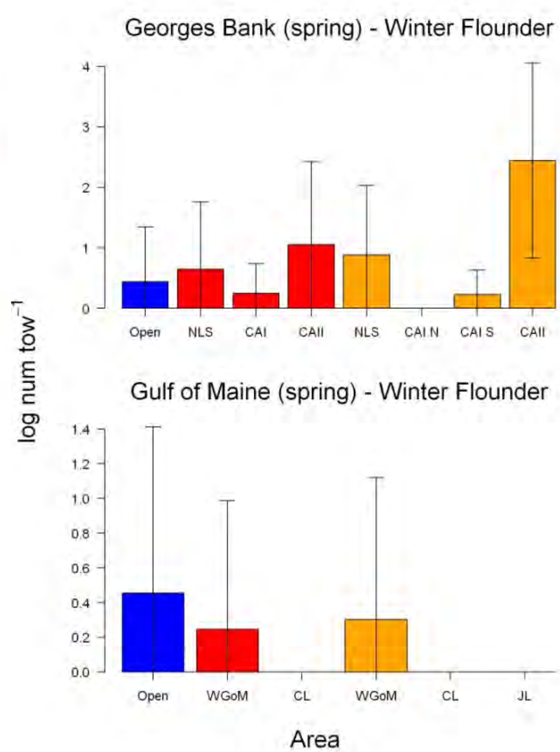


Mean Biomass CPUE Index 2005-2011   Mean Abundance CPUE Index 2005-2011



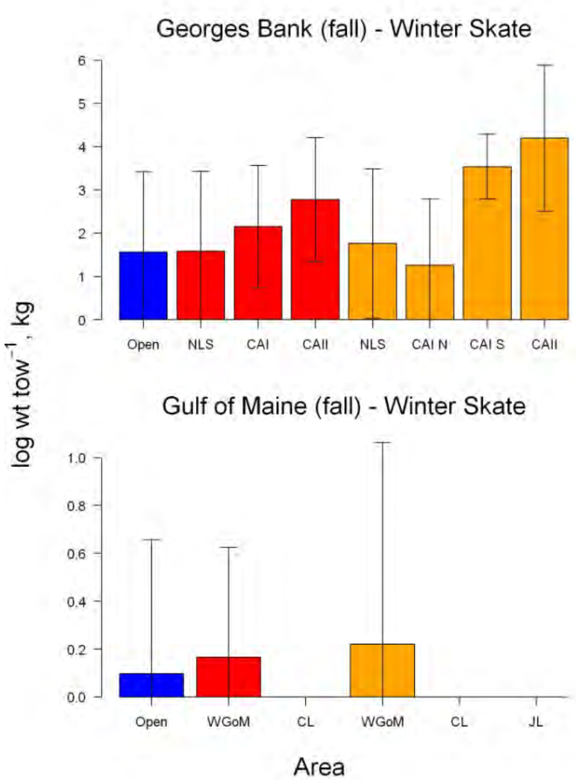


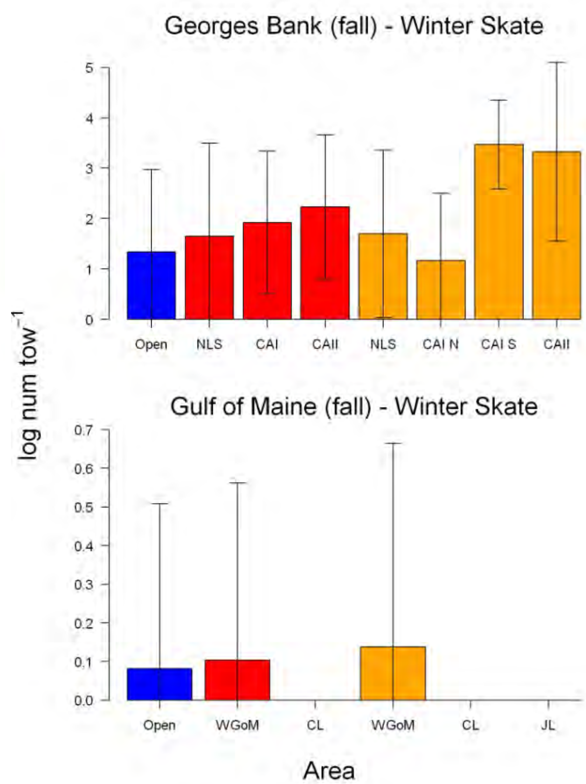


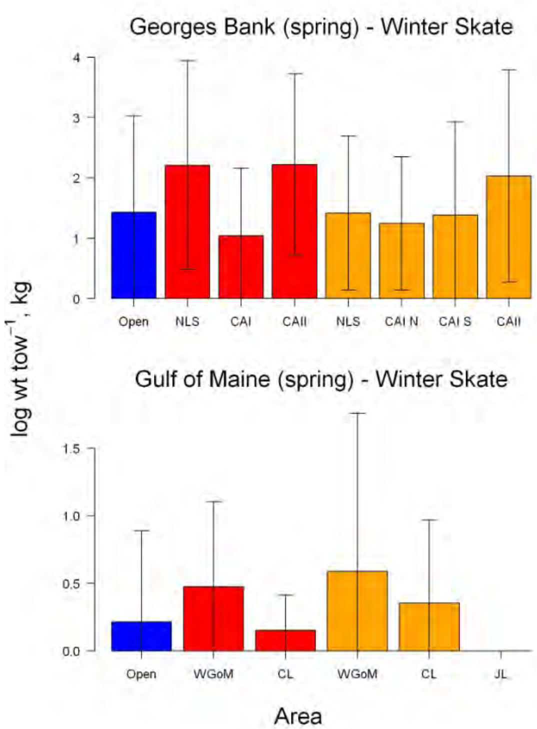


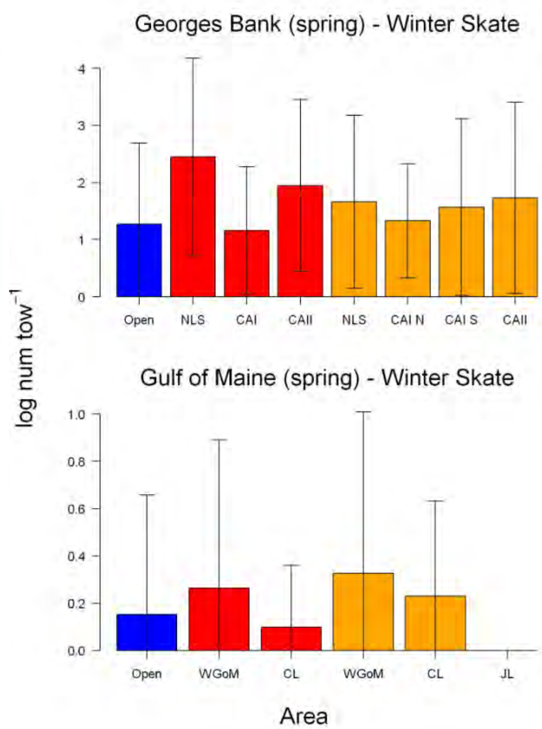
Mean Biomass CPUE Index 2005-2011

Mean Abundance CPUE Index 2005-2011









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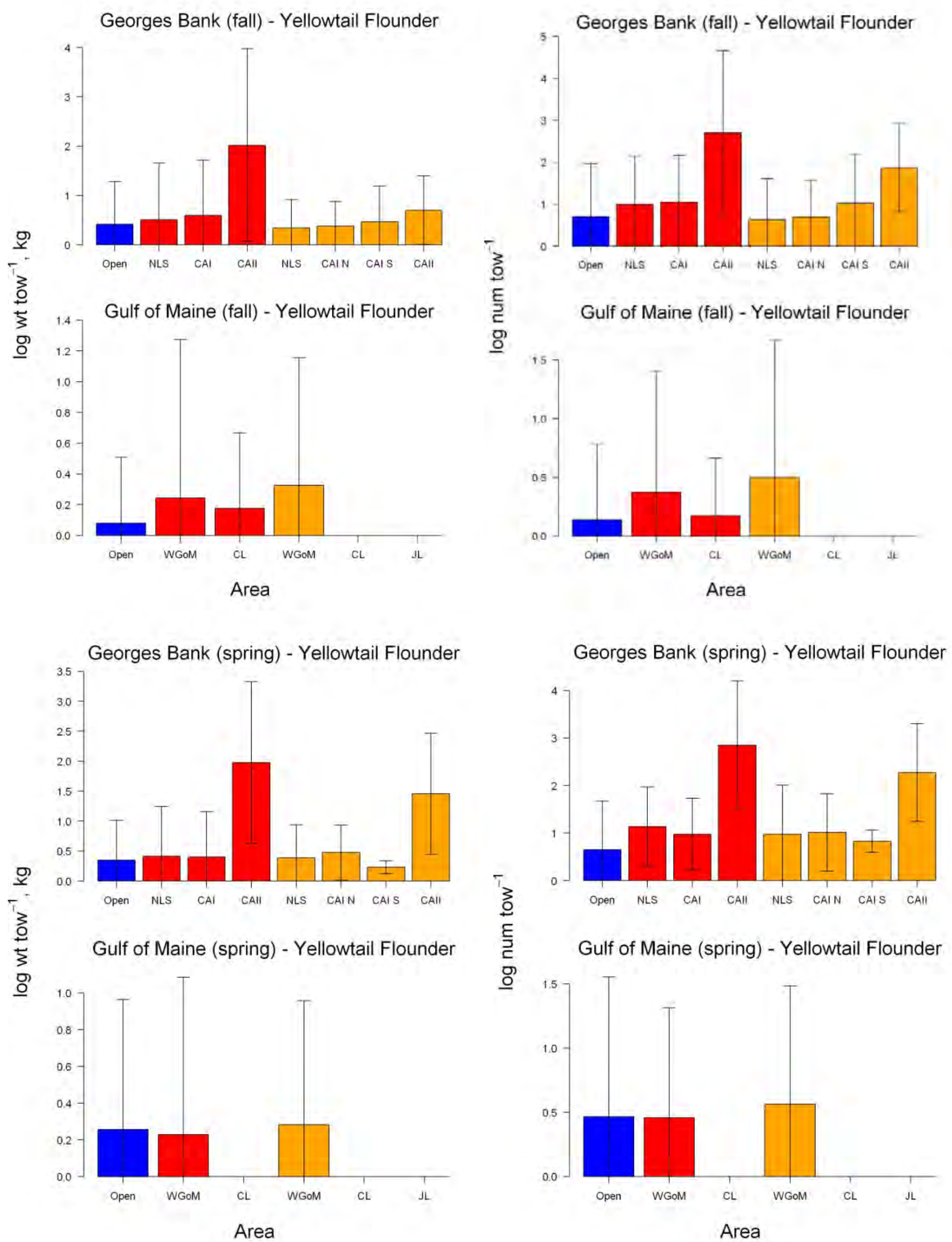


Table 60. Total abundance from NEFSC fall surveys 2005-2011

Area	Barndoor Skate	Winter Skate	Smooth Skate	Thorny Skate	Atlantic Cod	Haddock	Pollock	White Hake	Atlantic Halibut	American Plaice	Yellowtail Flounder	Winter Flounder	Witch Flounder	Window pane	Redfish	Monkfish
GB_open	1319615	5838031	407970	248890	793708	3224366	75453	1253597	7526	1301344	2121133	2370312	622126	2385473	1955949	1109722
GoM_open	214632	178375	1604717	717018	1223747	2173895	693859	14701476	202655	22150401	315110	839136	5188667	307579	72428806	3133514
Cashes Ledge	8976	0	159598	51829	78786	97689	62729	78346	5264	368463	6765	0	142422	0	8249012	66541
Closed Area I	148289	599805	49622	54715	61930	748203	20731	98135	0	77922	189698	408643	2667	124337	112833	49710
Closed Area II	175842	1482191	11183	5164	34254	1532163	1705	122862	6188	33581	2493955	219406	9388	381216	11362	53628
NLCA	160852	686415	2318	0	2318	32971	0	2318	0	0	276301	210845	2318	426226	0	58028
WGoM	8645	8610	72441	83451	521604	465547	244989	287021	1379	1296610	35682	51634	95982	2197	6312550	67969
CAI N	47533	111938	72133	81556	58943	2804616	25886	146317	0	129469	49911	53783	3000	0	217378	38448
CAI S	23026	473346	0	0	0	4804	0	0	0	0	27104	14713	0	126252	0	2876
CAII	85726	446416	7199	0	77385	3123968	2484	22909	4105	4105	91147	87965	0	17872	0	4105
Cashes	0	0	57079	14887	46335	148982	6782	3001	5106	201687	0	0	53156	0	1899410	6782
Jeffreys Bank	0	0	11859	7630	14996	22270	3376	81425	3376	95648	0	0	19742	0	1197914	24479
NLCA	154053	392540	0	0	0	16688	0	3110	0	0	76994	117375	3110	210020	0	32996
WGoM_hab	4247	8763	58722	82028	651144	553040	193942	121154	1383	925164	38143	49902	75845	2207	3098833	41252

Table 61. Total biomass (kg) from NEFSC fall surveys 2005-2011

Area	Barndoor Skate	Winter Skate	Smooth Skate	Thorny Skate	Atlantic Cod	Haddock	Pollock	White Hake	Atlantic Halibut	American Plaice	Yellowtail Flounder	Winter Flounder	Witch Flounder	Window pane	Redfish	Monkfish
GB_open	1847480	7799893	231672	223635	931513	1595324	90564	952524	11134	542325	1077413	1682447	330308	799360	1229058	1391440
GoM_open	502433	216867	626185	815854	1462173	1951977	828156	10426722	282999	4643342	174069	439877	1161522	81316	20173671	2783552
Cashes Ledge	22689	0	63353	102250	123088	59677	83566	71800	2726	41131	6871	0	46366	0	845938	106067
Closed Area I	388807	777641	32447	40741	84814	454728	20759	68587	0	41780	84008	413479	1002	46193	74641	83205
Closed Area II	323900	2692694	10222	2611	37918	555573	649	41175	8327	13335	1167504	219370	5956	103667	4568	64797
NLCA	153048	629144	1692	0	3734	5706	0	430	0	0	106450	110056	874	119231	0	63726
WGoM	23824	14235	42467	77386	999629	589796	358205	408141	1781	227841	21795	37937	43961	1077	974450	107885
CAI N	171540	127412	43183	56624	68963	1396236	25925	99229	0	58378	23262	63224	1115	0	122194	62276
CAI S	43284	507640	0	0	0	313	0	0	0	0	9075	12935	0	25831	0	30
CAII	178373	1090022	5871	0	74703	922490	908	8735	4269	1995	16925	101090	0	7971	0	11491
Cashes	0	0	32950	30808	61370	84273	4281	2754	2499	20530	0	0	25429	0	195993	18361
Jeffreys Bank	0	0	2171	26427	10050	4696	16899	37497	8551	12809	0	0	5647	0	112589	14355
NLCA	164738	424461	0	0	0	960	0	572	0	0	35524	55565	1165	57376	0	39759
WGoM_hab	8458	14647	33095	77718	1340093	719882	216866	153579	1788	153373	22744	37622	34402	1079	384287	71965

Table 62. Total abundance from NEFSC spring surveys 2005-2011

Area	Barndoor Skate	Winter Skate	Smooth Skate	Thorny Skate	Atlantic Cod	Haddock	Pollock	White Hake	Atlantic Halibut	American Plaice	Yellowtail Flounder	Winter Flounder	Witch Flounder	Windowpane	Redfish	Monkfish
GB_open	1412417	5315540	399679	219806	1273595	2823633	88312	892440	26300	1520217	1892858	1143748	1107369	2011287	913007	681935
GoM_open	88033	347158	1285297	664615	1485680	1136412	1564493	7936959	218524	18924784	1251504	1216306	6582872	507148	21329102	2222425
Cashes Ledge	0	3722	13927	52899	15238	30114	17378	146004	0	509006	0	0	384737	0	2174039	124295
Closed Area I	7331	222980	33674	43971	72050	292186	0	19190	0	111946	170011	29088	1994	65143	46935	0
Closed Area II	55537	1072674	1858	0	630832	10147504	5633	6248	1858	261896	2912201	332596	17438	683056	0	4843
NLCA	280105	1713996	0	10014	38396	18182	0	0	0	0	344658	147406	11678	395403	0	7695
WGoM	0	23864	90626	96550	581686	168614	149956	79746	3012	1530000	45717	21932	302818	0	4085441	127576
CAI N	9090	140105	49265	68319	67960	469150	0	22252	0	149751	88529	0	2386	17944	74166	0
CAI S	0	57630	0	0	0	0	0	0	0	0	19599	3951	0	15200	0	0
CAII	7119	77283	1739	0	177027	2774001	1739	4318	1739	16398	145473	175506	5778	3658	0	2839
Cashes	0	3001	8197	30413	3001	18712	6782	86316	0	234847	0	0	150637	0	2066860	65743
Jeffreys Bank	0	0	0	0	0	0	0	53245	5380	37319	0	0	45102	0	0	0
NLCA	62289	376061	0	0	43980	8540	0	0	0	0	146314	125336	4171	148683	0	4171
WGoM_hab	0	22801	76231	80193	632809	172275	73154	40820	2799	1193820	44807	20904	194519	0	3083811	74276

Table 63. Total biomass (kg) from NEFSC spring surveys 2005-2011

Area	Barndoor Skate	Winter Skate	Smooth Skate	Thorny Skate	Atlantic Cod	Haddock	Pollock	White Hake	Red Hake	Atlantic Halibut	American Plaice	Yellowtail Flounder	Winter Flounder	Witch Flounder	Window pane	Redfish	Monkfish
GB_open	1264536	6575967	190202	157502	1253399	1838957	80400	503061	2972921	30805	514565	856242	682686	471981	625828	482235	919245
GoM_open	147693	505700	469037	638600	1799488	971486	2186771	4448093	4230947	263413	4184343	617830	504245	1736058	77411	6947113	2508215
Cashes Ledge	0	5874	5082	29806	34805	36227	38670	69746	155850	0	69832	0	0	113022	0	640244	148768
Closed Area I	1254	187747	12517	23956	54423	214469	0	5318	33424	0	26023	50729	20970	640	17313	33696	0
Closed Area II	32862	1464494	1190	0	1139096	7087153	10343	1528	4623	4057	92949	1111600	268672	12740	213072	0	8720
NLCA	81095	1322144	0	1171	8249	19760	0	0	88250	0	0	82712	75823	3449	75383	0	3736
WGoM	0	48212	43904	126039	1069684	179636	210302	35013	248398	844	279905	20287	17374	93575	0	571416	101850
CAI N	1493	124653	16057	33041	44115	320373	0	6129	35143	0	26065	30649	0	759	5628	49304	0
CAI S	0	45300	0	0	0	0	0	0	50	0	0	3929	4893	0	3266	0	0
CAII	4494	110661	1096	0	438823	1904557	1434	713	1687	4004	6679	54902	175638	4569	1288	0	2157
Cashes	0	4919	1671	15348	5917	24012	16991	37305	116124	0	33193	0	0	53646	0	438841	62111
Jeffreys Bank	0	0	0	0	0	0	0	11242	5086	20683	6624	0	0	4517	0	0	0
NLCA	22272	275495	0	0	2572	10442	0	0	5476	0	0	41236	56663	1464	25095	0	1556
WGoM_hab	0	47382	39354	81703	1125263	181395	88390	16586	125106	781	196246	19295	16463	61229	0	347700	56494

4.7.3 Summary of Fishing Performance Data on Observed Trips

FW 48 analyzed the observed catches from trips using different gear types. The data was compiled from at-sea monitoring and sea sampling data from 2003-2012. The data was then organized to show catch compositions, comparisons of trawl and gillnet effectiveness and catch ratios, and total catches. In general, the haddock separator trawl appears much more effective at targeting haddock and avoiding cod and flounders. On the other hand, gillnet vessels did not appear able to target any stocks while fishing on Georges Bank, although skates were the primary species caught. Hook vessels appear able to target haddock and dogfish with minimal catch of other species. The results of these analyses could give an indication as to the amount of fishing effort that may be concentrated into the sector exemption areas.

4.7.3.1 Distribution of observed hauls using trawl gear

The distribution of observed fishing indicated by the gear type used on each observed tow is shown in Figure 57. This allows for a visual representation of the data used to create the following tables. The closed areas are indicated by the dashed lines around their perimeter. The map shows more intense fishing effort in concentrated areas, specifically around the boundaries of some closures and the northern and southern edges of Georges Bank. There is a concentration of hauls using the standard trawl around the WGOM Closed Area, Closed Area I and on both the northern and southern edges of Georges Bank. The Ruhle and separator trawls are used primarily in the southern Georges Bank area and around Closed Area 2. A number of hauls inside Closed Area 2 using the separator trawl are also visible but these hauls are from the Haddock Special Access Program. The amount of activity occurring in these locations, specifically those around the closed area perimeters, could reflect higher catch totals.

The target species of the hauls performed by vessels using the standard trawl gear are indicated in Figure 58. Hauls focusing on some species appear to congregate in specific areas while hauls targeting other species are more spread out. Trips on Georges Bank mostly focus on haddock and as such, haddock is more frequent and concentrated on the northern and southern edges of Georges Bank on the map. There is also a concentration of trips targeting Winter Flounder on the northern edge. Redfish is also a target species on the northern edge of Georges Bank and both Redfish and Pollock on the southern edge, with some trips targeting Cod as well.

The target species of the hauls performed by vessels using the separator trawl gear are indicated in Figure 59. A much lower number of hauls is observed, indicating a less frequent use of the haddock separator trawl in these areas from 2003-2012. The largest concentration of hauls is around the northern and southern edges of Georges Bank, as well as around the borders of Closed Area I and II. The haddock hauls occurring inside Closed Area II are due to the Haddock SAP implemented in 2009. These hauls are predominantly targeting Haddock. The concentration of winter flounder hauls occurring on the northern edge of Georges Bank and the yellowtail flounder hauls on the southern edge are likely due to the excluder type being miscoded. It is highly unusual for vessels using a separator trawl to target yellowtail flounder and winter flounder. Hauls targeting other species are also spread out along the northern edge of Georges Bank.

Figure 57. Observed hauls by trawl type.

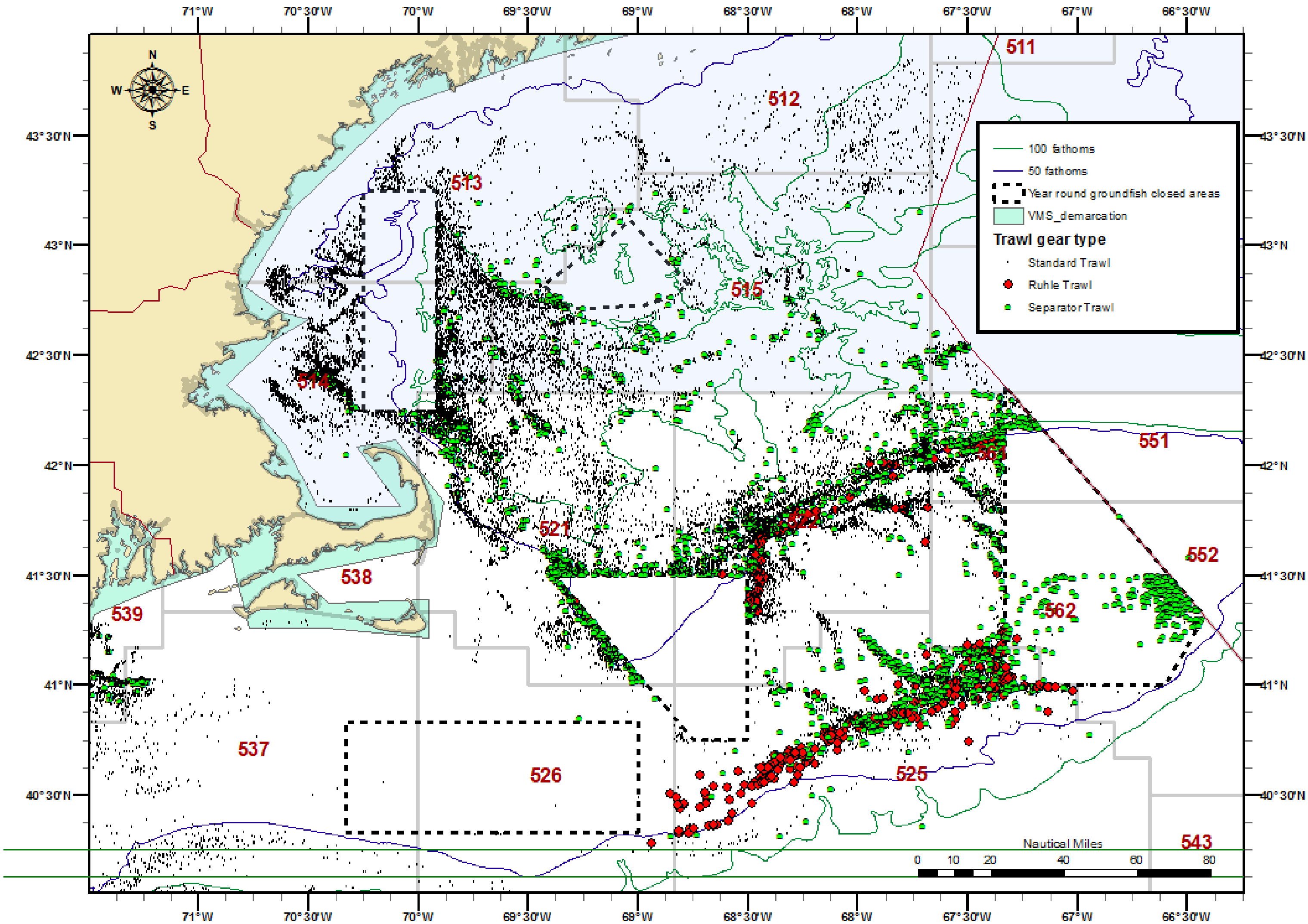


Figure 58. Observed hauls by target species using a standard trawl

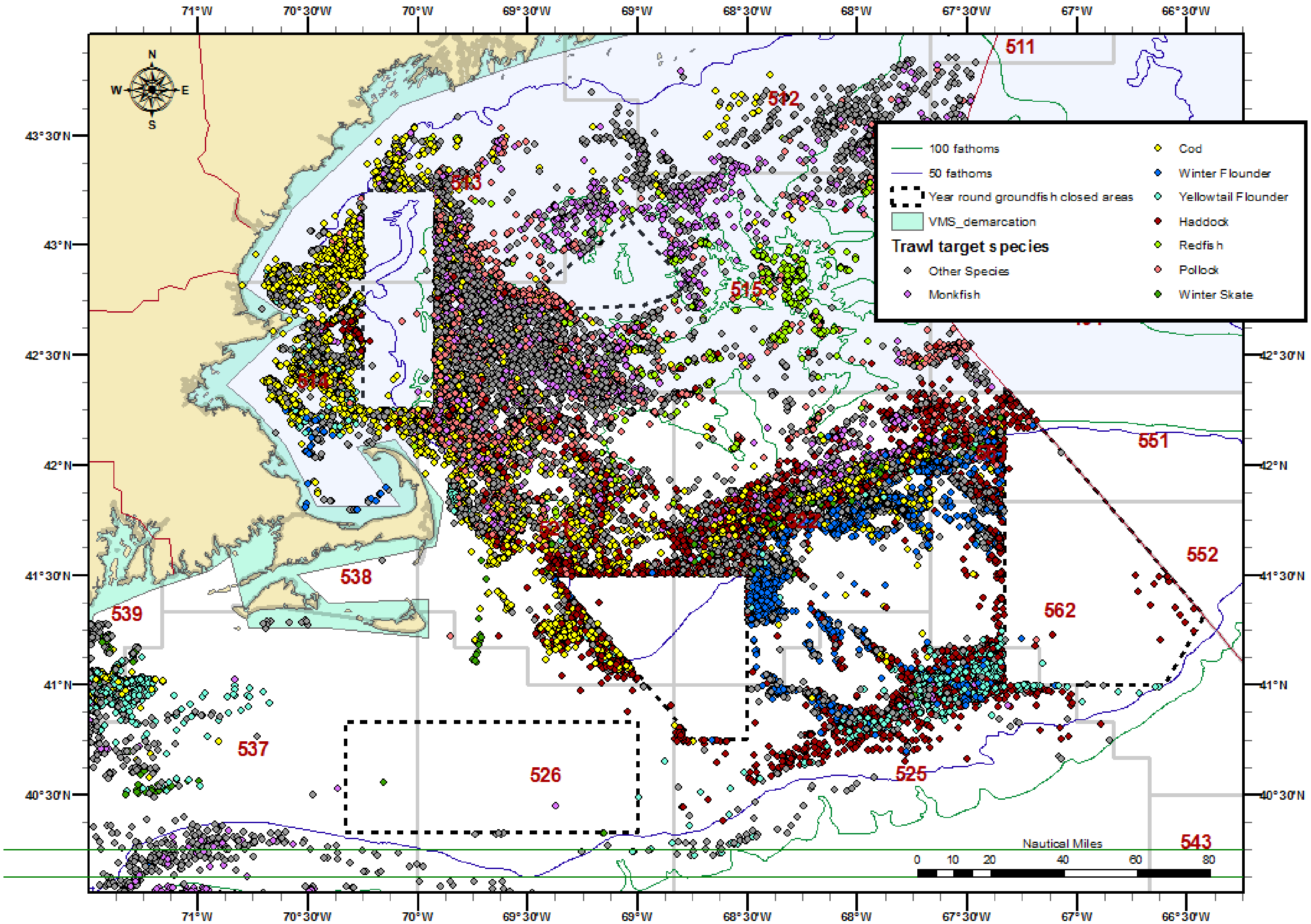
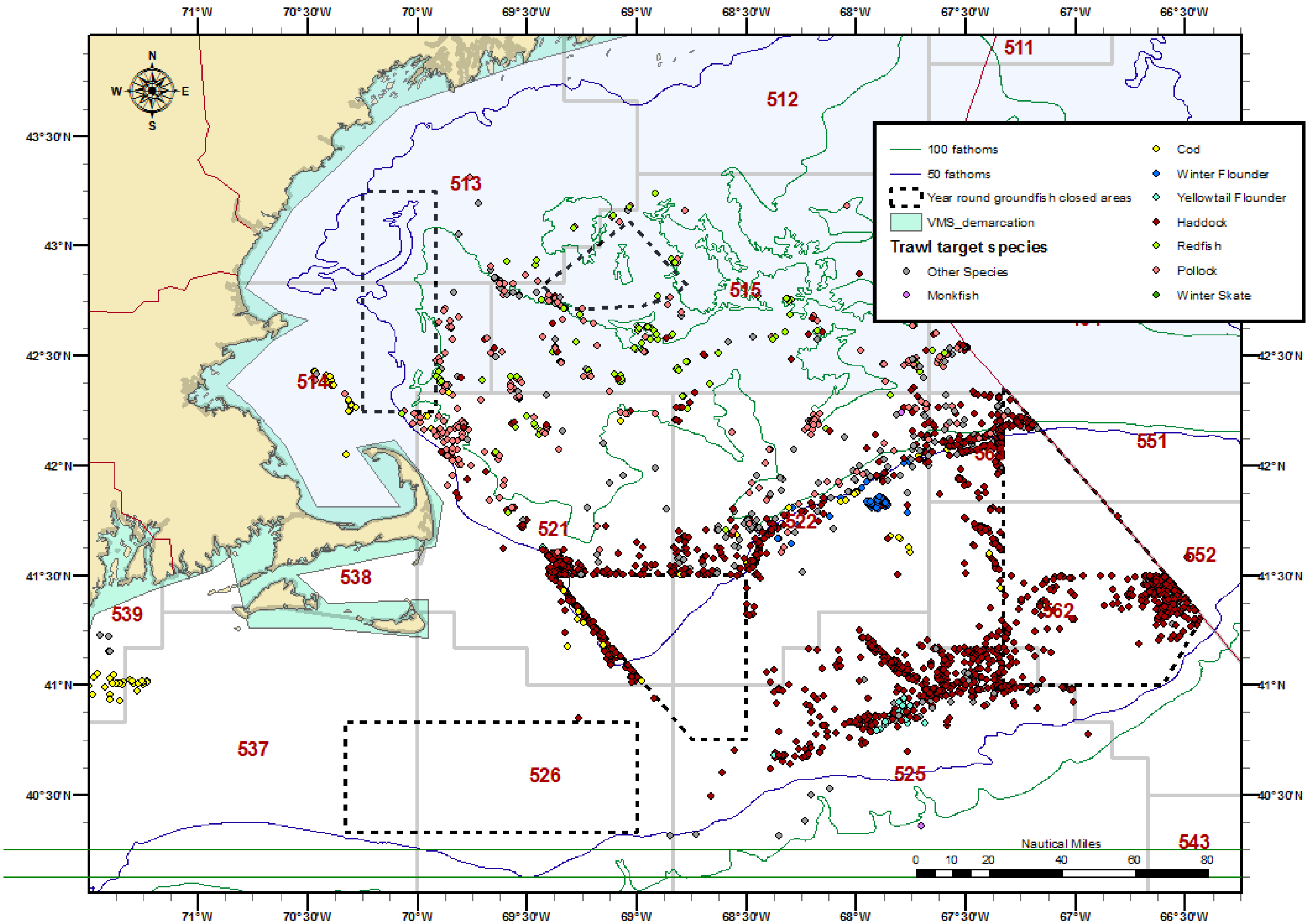


Figure 59. Observed hauls by target species using a separator trawl



Standard and Separator trawl performance

FW 48 also analyzed trawl performance for observed trips fishing standard and haddock separator trawls on Georges Bank. Only the most relevant analyses from FW 48 are included in this document, for additional data and analyses, see FW 48.

Table 64 lists catch ratios comparing the catch of target and other species on Georges Bank by standard and haddock separator trawls. A ratio over 1.00 indicates that there was a greater catch of the species in the numerator than the species in the denominator. For example, the haddock/cod ratio in 2005 is 2.49, indicating that for every 1 lb. of observed catch of cod there was 2.49 lbs. of observed catch of haddock. The opposite is true for ratios under 1.00, indicating a lower catch of the species in the numerator than the denominator. These observed catch ratios are shown as a bar graph in Figure 60.

The purpose of Table 64 and Table 65 is to provide an alternative view of the catch of each species on Georges Bank hauls and to allow for comparisons of the catch of standard and separator trawls. The target species in Table 64 are haddock, redfish, pollock, monkfish and skates. The most notable difference between the two gear types in this table are the comparison of the total catch/species ratios. The haddock separator trawl has much higher total catch/flounder ratios, almost double than those for the standard trawl. This indicates that the observed catch totals of yellowtail flounder and winter flounder for the haddock separator trawl are much lower than the respective ratios for the standard trawl. This is reflected in , as the catch percentage of winter and yellowtail flounder for the separator trawl are half of the respective percentages for the standard trawl. Vessels using the separator trawl also caught four times more haddock/cod than vessels using the standard trawl. There is a consistent difference in Table 64 between the species/cod ratios and the species/flounder ratios for both gear types. Cod generally makes up a larger amount of total catch each year in Table 65 than winter flounder or yellowtail flounder. There are much higher haddock/species ratios for the observed separator trawl data than the observed standard trawl data. This is reflected in Table 65, where haddock makes up thirty-five percent more of the observed total catch for separator trawls than standard trawls. The low percentage of Haddock in the standard trawl data indicates that vessels are not focusing on haddock with that gear type. The standard trawl had more observed catch of monkfish than the separator trawl and the separator trawl had more observed catch of pollock.

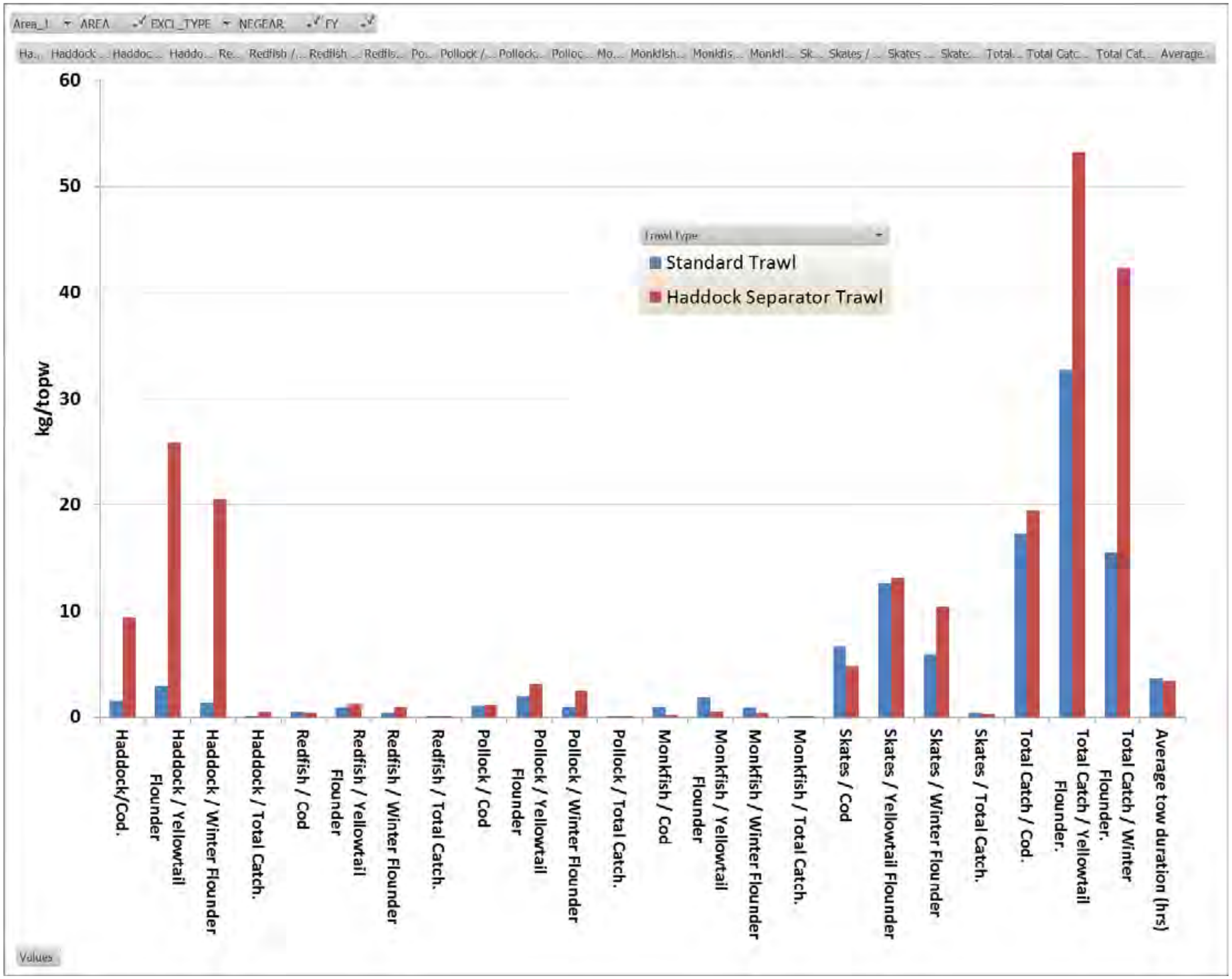
Table 64. Catch ratios for vessels using a standard or haddock separator trawl on Georges Bank.

Fishing Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total # of Hauls and Overall Average
Standard Trawl											
# of Hauls	1,397	10,657	13,615	7,803	9,796	9,983	7,511	7,351	9,398	2,663	80,174
Haddock/Cod.	2.01	2.23	2.49	1.16	1.16	2.01	2.06	2.11	1.19	1.15	1.76
Haddock / Yellowtail Flounder	4.90	2.19	1.04	1.71	3.21	3.20	2.44	3.90	2.06	6.07	2.16
Haddock / Winter Flounder	13.39	5.59	1.74	2.17	3.48	3.19	2.56	2.16	1.14	0.54	2.41
Haddock / Total Catch.	0.15	0.15	0.09	0.07	0.11	0.14	0.11	0.12	0.08	0.05	0.11
Redfish / Cod	0.03	0.08	0.07	0.08	0.08	0.12	0.22	0.39	0.43	1.06	0.19
Redfish / Yellowtail Flounder	0.08	0.08	0.03	0.12	0.23	0.19	0.26	0.73	0.74	5.60	0.23
Redfish / Winter Flounder	0.21	0.20	0.05	0.16	0.25	0.19	0.27	0.40	0.41	0.50	0.26
Redfish / Total Catch.	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.03	0.04	0.01
Pollock / Cod	0.25	0.20	0.35	0.39	0.20	0.55	0.31	0.94	1.00	1.84	0.48
Pollock / Yellowtail Flounder	0.62	0.20	0.15	0.58	0.55	0.87	0.37	1.73	1.73	9.76	0.60
Pollock / Winter Flounder	1.70	0.50	0.25	0.74	0.59	0.87	0.39	0.96	0.96	0.87	0.66
Pollock / Total Catch.	0.02	0.01	0.01	0.03	0.02	0.04	0.02	0.05	0.06	0.08	0.03
Monkfish / Cod	2.26	1.38	2.74	1.78	0.54	0.53	0.55	0.75	0.94	2.04	1.13
Monkfish / Yellowtail Flounder	5.51	1.36	1.14	2.62	1.49	0.84	0.66	1.40	1.63	10.79	1.39
Monkfish / Winter Flounder	15.06	3.47	1.92	3.33	1.61	0.84	0.69	0.77	0.91	0.96	1.55
Monkfish / Total Catch.	0.17	0.09	0.10	0.11	0.05	0.04	0.03	0.04	0.06	0.09	0.07
Skates / Cod	5.29	6.34	12.28	6.64	5.30	7.04	8.23	7.15	5.95	8.38	7.11
Skates / Yellowtail Flounder	12.90	6.22	5.10	9.74	14.69	11.21	9.76	13.25	10.30	44.42	8.74
Skates / Winter Flounder	35.24	15.91	8.59	12.39	15.90	11.16	10.23	7.32	5.71	3.96	9.73
Skates / Total Catch.	0.41	0.43	0.45	0.43	0.49	0.48	0.46	0.41	0.38	0.35	0.44
Total Catch / Cod.	13.02	14.75	27.53	15.60	10.82	14.77	17.92	17.64	15.76	23.89	16.25
Total Catch / Yellowtail Flounder.	31.73	14.48	11.43	22.88	29.98	23.50	21.26	32.66	27.27	126.57	19.98
Total Catch / Winter Flounder.	86.72	37.00	19.27	29.12	32.44	23.40	22.27	18.04	15.11	11.27	22.24
Haddock Separator Trawl											
# of Hauls		187	356	104	57	35	588	2,041	1,181	27	4,576
Haddock/Cod.		4.02	3.96	5.08	2.60	41.06	7.34	10.11	8.26	9.61	8.49
Haddock / Yellowtail Flounder		5.90	1.71	7.55	11.35	70.43	23.28	27.83	22.24	100.22	17.00
Haddock / Winter Flounder		6.93	2.16	5.26	3.69	29.98	34.09	27.99	12.94	24.83	16.16
Haddock / Total Catch.		0.25	0.20	0.37	0.16	0.71	0.45	0.49	0.47	0.30	0.45
Redfish / Cod		0.03	0.01	0.02	0.16	0.53	0.10	0.35	0.57	6.38	0.32
Redfish / Yellowtail Flounder		0.04	0.00	0.02	0.68	0.91	0.33	0.98	1.53	66.60	0.65
Redfish / Winter Flounder		0.05	0.00	0.02	0.22	0.39	0.49	0.98	0.89	16.50	0.62
Redfish / Total Catch.		0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.03	0.20	0.02
Pollock / Cod		0.75	0.11	0.77	0.33	9.18	0.35	1.01	1.35	5.60	0.94
Pollock / Yellowtail Flounder		1.10	0.05	1.15	1.44	15.75	1.11	2.77	3.63	58.45	1.87
Pollock / Winter Flounder		1.29	0.06	0.80	0.47	6.71	1.63	2.79	2.11	14.48	1.78
Pollock / Total Catch.		0.05	0.01	0.06	0.02	0.16	0.02	0.05	0.08	0.17	0.05
Monkfish / Cod		0.70	0.98	0.26	0.19	0.64	0.19	0.14	0.29	0.92	0.27
Monkfish / Yellowtail Flounder		1.03	0.42	0.39	0.82	1.10	0.61	0.39	0.77	9.61	0.54
Monkfish / Winter Flounder		1.21	0.53	0.27	0.27	0.47	0.89	0.40	0.45	2.38	0.51
Monkfish / Total Catch.		0.04	0.05	0.02	0.01	0.01	0.01	0.01	0.02	0.03	0.01
Skates / Cod		4.77	7.79	3.55	2.38	2.12	4.75	5.54	3.42	2.98	4.91
Skates / Yellowtail Flounder		7.00	3.37	5.27	10.40	3.64	15.08	15.26	9.21	31.10	9.82
Skates / Winter Flounder		8.22	4.25	3.67	3.38	1.55	22.08	15.35	5.35	7.70	9.34
Skates / Total Catch.		0.29	0.39	0.26	0.15	0.04	0.29	0.27	0.19	0.09	0.26
Total Catch / Cod.		16.33	20.01	13.80	15.92	57.53	16.21	20.44	17.63	32.25	18.79
Total Catch / Yellowtail Flounder.		23.96	8.66	20.51	69.49	98.68	51.44	56.29	47.46	336.48	37.60
Total Catch / Winter Flounder.		28.14	10.90	14.28	22.58	42.01	75.33	56.62	27.60	83.35	35.75

Table 65. Observed % of each species in total catch using a standard trawl or haddock separator trawl on Georges Bank

	Fishing Year										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total # of Hauls and Average %
Standard Trawl											
# of Hauls	1,397	10,657	13,615	7,803	9,796	9,983	7,511	7,351	9,398	2,663	80,174
% of Cod in Total Catch.	7.7%	6.8%	3.6%	6.4%	9.2%	6.8%	5.6%	5.7%	6.3%	4.2%	6.2%
% of Haddock in Total Catch.	15.4%	15.1%	9.1%	7.5%	10.7%	13.6%	11.5%	11.9%	7.6%	4.8%	10.8%
% of Monkfish in Total Catch.	17.4%	9.4%	10.0%	11.4%	5.0%	3.6%	3.1%	4.3%	6.0%	8.5%	7.0%
% of Pollock in Total Catch.	2.0%	1.4%	1.3%	2.5%	1.8%	3.7%	1.7%	5.3%	6.3%	7.7%	3.0%
% of Redfish in Total Catch.	0.2%	0.5%	0.3%	0.5%	0.8%	0.8%	1.2%	2.2%	2.7%	4.4%	1.1%
% of Skates in Total Catch.	40.6%	43.0%	44.6%	42.6%	49.0%	47.7%	45.9%	40.6%	37.8%	35.1%	43.7%
% of Winter Flounder in Total Catch	1.2%	2.7%	5.2%	3.4%	3.1%	4.3%	4.5%	5.5%	6.6%	8.9%	4.5%
% of Yellowtail Flounder in Total Catch	3.2%	6.9%	8.7%	4.4%	3.3%	4.3%	4.7%	3.1%	3.7%	0.8%	5.0%
Haddock Separator Trawl											
# of Hauls		187	356	104	57	35	588	2,041	1,181	27	4,576
% of Cod in Total Catch.		6.1%	5.0%	7.2%	6.3%	1.7%	6.2%	4.9%	5.7%	3.1%	5.3%
% of Haddock in Total Catch.		24.6%	19.8%	36.8%	16.3%	71.4%	45.3%	49.4%	46.9%	29.8%	45.2%
% of Monkfish in Total Catch.		4.3%	4.9%	1.9%	1.2%	1.1%	1.2%	0.7%	1.6%	2.9%	1.4%
% of Pollock in Total Catch.		4.6%	0.6%	5.6%	2.1%	16.0%	2.2%	4.9%	7.7%	17.4%	5.0%
% of Redfish in Total Catch.		0.2%	0.0%	0.1%	1.0%	0.9%	0.6%	1.7%	3.2%	19.8%	1.7%
% of Skates in Total Catch.		29.2%	38.9%	25.7%	15.0%	3.7%	29.3%	27.1%	19.4%	9.2%	26.1%
% of Winter Flounder in Total Catch		3.6%	9.2%	7.0%	4.4%	2.4%	1.3%	1.8%	3.6%	1.2%	2.8%
% of Yellowtail Flounder in Total Catch		4.2%	11.6%	4.9%	1.4%	1.0%	1.9%	1.8%	2.1%	0.3%	2.7%

Figure 60. Graph of ratios of observed target species catch to other species catch using a standard or haddock separator trawl on Georges Bank.



4.7.4 Physical Environment

4.7.4.1 Nantucket Lightship

The proposed eastern NLCA exemption area is located on Nantucket Shoals and extends into the Great South Channel. The bottom topography follows the contours of the channel with deeper water (80-90 m) to the southeast and shallower water (40-50 m) in the northwest. Depths in the bottom of the channel near the eastern boundary of this area also exceed 80 m. Dominant substrates are mostly sand and granule-pebble with a small area of cobble-boulder at the northern boundary (Figure 61). Sediments in the deeper, southern portion of the area (mostly sand) and in the deeper area of the channel (sand and gravel) are un-disturbed by tidal currents, whereas the sandy sediments in the shallower northwest corner are unstable (Figure 62).

The proposed western NLCA exemption area is located west of Nantucket Shoals in a less dynamic environment. Bottom contours trend east-west with depths increasing from 20-30 m in the northeast corner to 80-90 m in the south nearer the shelf. This area is outside the area covered by the SMAST video surveys, so the only available information on sediment types is from U.S. Geological Survey bottom sample analyses at specific, scattered locations (Figure 63).[24] Most of the sediment samples collected in the western NLCA area were dominated by sand, mixed to varying degrees with silt. Three samples from deeper water in the southern part of the area were predominantly silt. Critical shear stress resulting from current and wave action in the NLCA was evaluated by Dalyander et al. (2013) using a different methodology than Harris and Stokesbury (2002) used for Georges Bank. On an annual basis, they concluded that velocities sufficient to move sediments in the western NLCA occurred 10-20% of the time between 40 and 50 m in the northern part of the area, diminishing to 5-10% at 60-70 m, and <5% at 80 m (Figure 64). In the winter when wave action extends into deeper water, critical shear stresses are exceeded 20-40% of the time in shallow water and 5-15% of the time in deeper water. In summer, model predictions dropped to <10% of the time in shallow water and 1-2% in deeper water. Over Nantucket Shoals, sediment mobility thresholds are exceeded over 50% of the time (annually) due to the combined effects of currents and wave action.

[24] Many of the devices used to collect sediment samples (e.g., bottom grab samples) that were analyzed to create the U.S.G.S. US Seabed database do not function well in more complex, rocky bottom habitats, so the data are biased towards finer sediments.

Figure 61. Dominant substrates on western Georges Bank, Great South Channel, and eastern NLCA. See text for details.

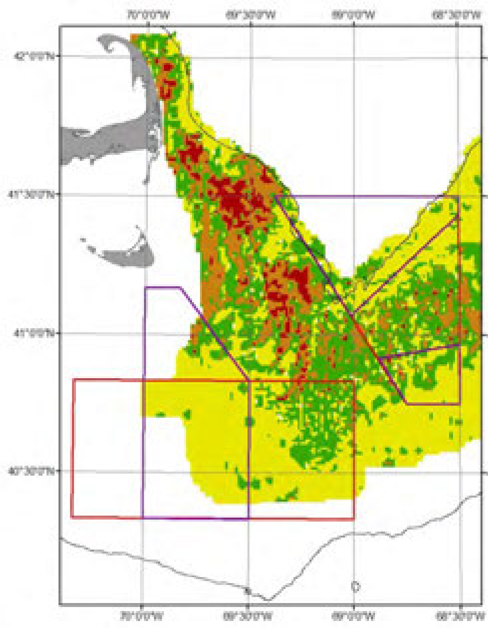
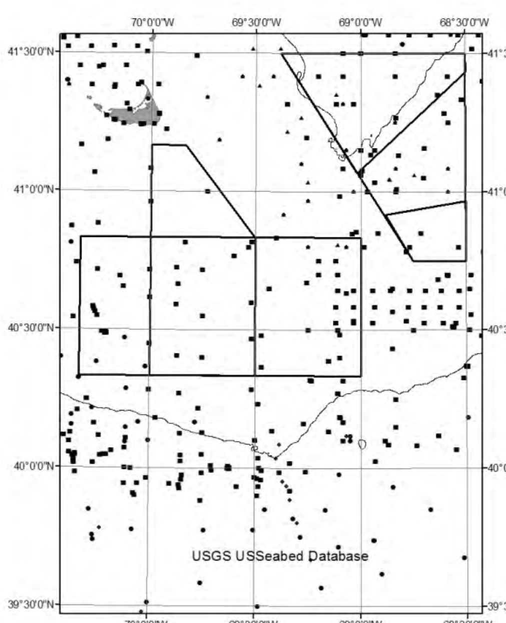


Figure 62. Sediment types in and around proposed exemption areas in CA I and the NLCA.



Squares are predominantly sand with variable percentages of mud and/or gravel, circles are mud with variable percentages of sand and/or gravel, and triangles are gravel with variable percentages of sand and/or gravel, and triangles are gravel with variable percentages of mud and/or sand. See text for details

Figure 63. Sediment stability on western Georges Bank, Great South Channel, and eastern NLCA ranked from high (blue) to low (red). See text for details.

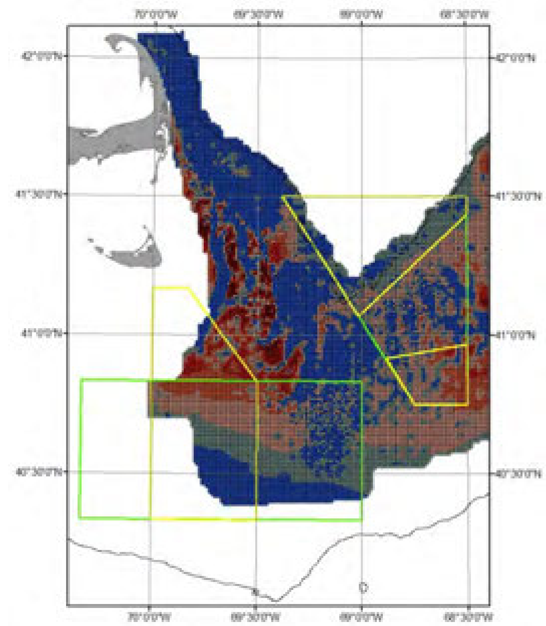
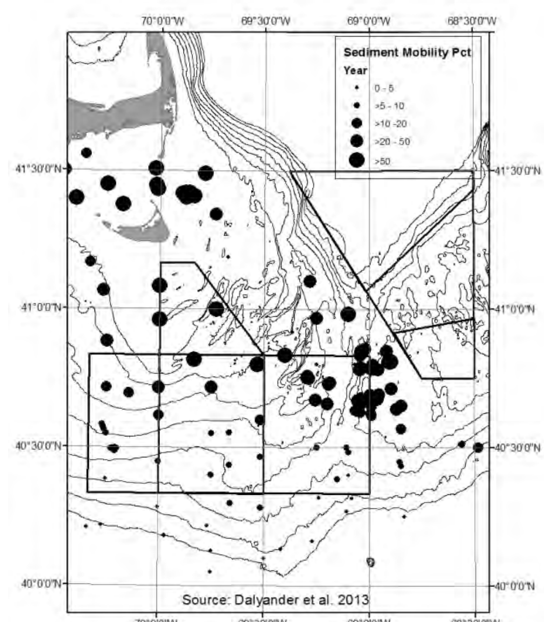


Figure 64. Sediment mobility in and around proposed exemption areas in the NLCA expressed as the percentage of time critical shear stress is exceeded annually. See text for details.



5.0 IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

Prior to the implementation of sectors, input controls affected the amount of fish that could be caught on a multispecies trip. Specifically, NMFS used binding limits on the total number of days at sea (DAS) each fisherman could fish, along with trip limits for certain species, to control fishing mortality for groundfish stocks. Fishermen were allocated a portion of the target allowable fishing mortality for each species by receiving a specific number of DAS. These fishermen were also prohibited from using certain fishing gear in an effort to further reduce catch per day.

The advent of sectors has not changed that overall process for non-sector fishermen. Common pool fishermen would still be assigned DAS based on a total allowable fishing mortality. However, rather than being assigned DAS, sectors are allocated an Annual Catch Entitlement (ACE) for the majority of the groundfish stocks. An approved sector operations plan provides the sector with more flexibility as to when and how sector members fish for those stocks. Sector fishermen should have increased flexibility with respect to when and how they fish relative to common pool members. This would likely motivate them to fish in a manner that increases their catch per unit of effort. Therefore, the total sector geardays over a year would likely be less than geardays under the common pool.

Northeast Multispecies fishermen target and/or catch several species. Since each species has its own ACE, sectors need to coordinate their fishing to ensure that the sector does not reach its ACE for a single stock well before it reaches its ACE for the other allocated stocks. This coordinated effort could result in:

1. increased harvest levels for previously under-exploited stocks
2. changes in the amount of gear fished by sector fishermen over the course of a year, and
3. increased gear selectivity and efficiency.

In summary, catch per unit of effort (CPUE) should increase with the increased flexibility granted to sectors through an approved operations plan. This would tend to decrease the number of days with gear in the water (geardays, i.e., our proxy for CPUE, see Section 4.1 for a description of how a gearday is calculated). However, geardays might increase if the ability to target specific stocks allows sectors to more fully exploit previously under-exploited stocks.

Section 5.1 further evaluates potential impacts to the physical environment and habitat, as well as physical resources, allocated target species, non-allocated target species and bycatch, protected resources, and human communities. Section 5.2 discusses cumulative impacts of the Proposed Action in combination with other past, present, and reasonably foreseeable actions.

5.1 IMPACT ASSESSMENT

Section 5.1 reviews the alternatives that are the subject of this evaluation, establishes criteria for evaluating the impact of each alternative on the VECs identified in Section 4.0, and discusses impacts.

5.1.1 Alternatives Assessed

This section identifies impacts associated with the operations plan requirements (Alternative 1) and the proposed sector-specific exemptions for FY 2015/16 (Alternative 2), as well as a No Action Alternative for each.

5.1.1.1 Sector Operations Plans (Alternative 1)

Amendment 16 identified the requirements of any proposed sector operations plan. These requirements include quota management, monitoring, administrative, and gear restriction measures. NMFS must review and approve any sector operations plan prior to implementation. The potential environmental impacts that may occur as a result from the approval of a sector operations plan are primarily limited by three aspects of the plan. These requirements include the identification of ACE thresholds based on the permit history of sector participants, as well as ACE allocation and discard monitoring.

Section 1.1.1 details the components of each sector's operations plan. Copies of all proposed FY 2015/16 operations plans can be found at http://www.regulations.gov. Once approved, copies of all operations plans can be found at: http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/multispecies/. Alternative 1 is the approval of the FY 2015/16 sector operations plans and harvest rules. If NMFS approves Alternative 1, additional exemptions discussed in Alternative 2 (sector operations plans exemptions) may be individually approved or disapproved.

5.1.1.2 Sector Specific Exemptions for Multispecies Sectors (Alternative 2)

Sectors who submit operations plans for approval may request exemptions to regulations that implement the Northeast Multispecies FMP. The intent is to increase harvest efficiency while minimizing the potential for adverse environmental impacts.

As described in Section 3.3, sectors must request all exemptions desired for the subject FY in their operations plans. Exemptions will only be granted to those sectors that specifically request them. For the purposes of this EA, NMFS evaluated impacts as if the exemption would be granted to all sectors because any sector may request any exemption that has been granted. Consequently, this analysis considers the highest potential impact.

The sector-specific exemptions are identified in Section 3.3. Alternative 2 for FY 2015/16 is the approval of sector operations plan exemptions either individually or as a group. The decision regarding Alternative 2 is contingent upon the approval of Alternative 1 (sector operations plans).

5.1.1.3 Programatic Analysis of Impacts

This document is a programmatic EA that analyzes the continued operation of sectors through the 2020 fishing year. As such, future approvals of operations plans up and until the expiration of this analysis on April 30, 2021, would be provided for unless impacts related to such approvals were substantially dissimilar to those analyzed within this EA. Operations plans contain required elements as required by the regulations implementing the FMP, and have been similar since the inception of sector management. Essentially, the sector operations plans and contracts approved by NMFS allowing sectors to operate contains administrative components that are reasonably forseeable, and not expected to change substantially over time. The component of the sector operations plans that contain exemption requests is the portion that may change over time, and as such all exemption approvals during this timeframe would be analyzed in terms of their impacts compared to the exemptions listed in Section 5.1.4 of this EA. Over the last few years of sector management, the number of requests for exemption from regulations has dramatically fallen. For FY 2015/16, sectors only requested one new exemption that was actually a revision to an approved FY 2014 exemption (redfish). For future exemptions that are substantially similar to the following exemptions and/or that have impacts that are substantially similar, no additional NEPA documentation would be necessary for their approval. However, it is possible that exemptions may be requested that are not substantially similar to the exemptions analyzed in this EA. In these cases, a supplemental environmental assessment may be needed to analyze the impacts of that future approval.

Exemptions generally fit into the following groupings: Administrative (e.g., EFP for sampling), Time and Area Closures (e.g., Access to Nantucket Lightship Closed Area), and Gear Modifications (e.g., small mesh and redfish exemptions). Generally, exemptions within a grouping have similar impacts, and are described within this section. For example, exemptions that are administrative in nature generally have negligible impacts, and would otherwise be categorically excluded if not for the annual sector approval process that allows for consideration within an environmental assessment. Exemptions that involve modification of gear generally have triggers, thresholds, or other monitoring requirements that allow NMFS to monitor catch and ensure that substantial harvest of sublegal species is not occurring. NMFS can also monitor discards to ensure that rebuilding of managed stocks is not being jeapordized. Finally, several of these types of exemptions also are analyzed with catch data from a specific fishing area for vessels using a certain gear type to determine the likelihood of groundfish and other catch within the area. The final set of exemptions, time and area closures, typically have the potential for more substantial impacts to the human environment because the areas have been closed in most cases to protect groundfish. However, these exemptions also use gear restrictions to ensure that harvested species are of a legal size, and require observer coverage to ensure that discard of species of concern are not substantially higher. Please refer to Table 3 for a detailed list of which sectors have requested which exemptions for approval under the Proposed Action.

NMFS assessed the impact of sector operations for each year of sector management, and has found little impact for all VECs other than human communicates associated with sector management as compared to the no action alternative. The main substantial impact resulting from sector management is due to the additional flexibilities and reduction in regulatory bureden associated with the sector management regime. However, as many groundfish stocks are facing further reduced quotas due to critical stock status, this positive impact to human communities becomes somewhat less distinguishable from the overall short term negative impact to human communities as a result of reduced quotas. As stated throughout this assessment, the main driver of impacts to all VECs in the NE Multispecies FMP is the annual specifications setting. FW53, the latest action to set specifications, is likely to further reduce quotas for stocks of conern, and create additional hardship on human communities regardless of the sector management regime.

5.1.1.4 Potentially Impacted Valued Ecosystem Components (VECs)

This analysis considers impacts to 5 VECs:

<u>Physical Environment/Habitat/EFH:</u> For the purpose of this analysis the physical environment VEC consists of EFH in the Gulf of Maine, Georges Bank, the southern New England/Mid-Atlantic areas, and the continental shelf/slope sub-regions. The Sustainable Fisheries Act defines EFH as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Section 4.2 describes the conditions of the physical environment.

Target species: For the purpose of this analysis, the target species VEC includes 14 allocated target groundfish stocks managed under the Northeast Multispecies FMP (GOM cod, GB cod, GOM haddock, GB haddock, American plaice, witch flounder, GOM winter flounder, GB winter flounder, SNE/MA winter flounder, Cape Cod/GOM yellowtail flounder, GB yellowtail flounder, SNE/MA yellowtail flounder, redfish, pollock, and white hake). Section 4.3 describes the current condition of each stock.

Non-allocated target species and bycatch: For the purposes of this analysis, the non-allocated target and bycatch VEC follows the convention established in the Amendment 16 EIS, and includes spiny dogfish, skates, and monkfish. These species were the top three non-groundfish species landed by multispecies vessels in FY 2006 and FY 2007 under the Category B (regular) DAS program (see Table 87 of the Final EIS for Amendment 16). This action also includes American lobster under the non-allocated target species and bycatch VEC due the consideration of exemptions related to closed areas. Section 4.4 describes the current condition of these stocks.

Protected resources: This VEC includes species under NMFS' jurisdiction which are afforded protection under the Endangered Species Act (ESA) (i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act (MMPA). Table 31 lists the 14 marine mammal, sea turtle, and fish species that are classified as endangered or threatened under the ESA that occur in the area affected by this action. The remaining species discussed in Sec 4.5 are either protected by the MMPA and/or known to interact with the Northeast Multispecies fishery. Section 4.5 describes the current condition of these protected resources.

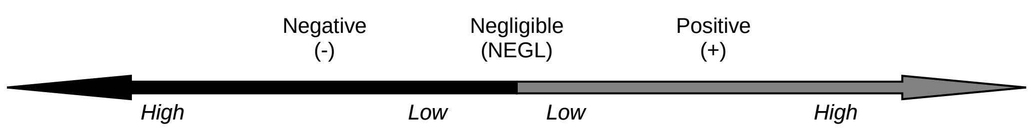
Human communities: This VEC includes impacts to people's way of life, traditions, and communities. These social and economic impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and other factors. Impacts would most likely be experienced across communities, gear cohorts, and vessel size classes. Section 4.6 describes the current conditions in the potentially impacted communities.

5.1.2 Evaluation Criteria

This EA evaluates the potential impacts using the criteria outlined in Table 66. Impacts from all alternatives are judged relative to the baseline conditions, as described in Section 4.0, and compared to each other.

Table 66. Impact Definitions and Qualifiers (Key to Table 85)

Impact Definition			
	Direction		
VEC	**Positive (+)**	**Negative (-)**	**Negligible (Negl)**
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:			
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 (not significant)		
Likely	Some degree of uncertainty associated with the impact		



Impact of Increased Operation Flexibility on Human Communities

As cited in the discussion of impacts within this section, increased “operational flexibility” generally has positive impacts on human communities as sectors and their associated exemptions grant fishermen some measure of increased “operational flexibility.” By removing the limitations on vessel effort (amount of gear used, number of days declared out of fishery, trip limits and area closures) sectors help create a more simplified regulatory environment. This simplified regulatory environment grants fishers greater control over how, when, and where they fish, without working under increasingly complex fishing regulations with higher risk of inadvertently violating one of the many regulations. The increased control granted by the sectors and their associated exemptions may also allow fishermen to maximize the ex-vessel price of landings by timing them based on the market.

There is the added benefit to human communities from the removal of regulatory constraints on effort as removing these limits can reduce frustration. Typical effort control management serves to constrain fishing ability but it has little impact on controlling expectations. As a result, the level of frustration rises with the inability to meet expectations (Smith, 1980). Under sector management expectations are controlled by the level of ACE granted each sector, but the ability to fish is still constrained by the management tools of the previous system. Each exemption that removes the management control on effort will allow fishing ability to rise to expectations and reduce frustration.

5.1.3 Impacts of Sector Operations Plans (Alternative 1)

Each sector's operations plan is unique. However, as discussed in Section 1.0, NMFS saw general uniformity in the operations plans for prior fishing years, and it anticipates this uniformity to continue. Therefore, this single EA incorporates all 17 sector operations plans for FY 2015/16.

The harvest rules for all sector operations plans tend to fall into one of four broad categories: quota management, monitoring, administrative, and gear restriction.

Quota Management: Harvest rules in this category are largely administrative actions taken to ensure the sector does not exceed its ACE. These rules may afford sector participants the flexibility to increase CPUE by timing fishing efforts. However, they are not expected to materially affect the mix of gear used by fishermen, the number of geardays, or fisheries related mortality.

Monitoring: Harvest rules in this category generally relate to data collection and reporting. These activities ensure that a sector does not exceed its ACE. They may also provide data to improve fisheries management. These harvest rules provide a better understanding of discard rates and may ultimately reduce under-fishing of some stocks. However, they are not expected to materially affect the mix of gear used by fishermen, CPUE, the number of geardays fished, or fisheries related mortality.

Administrative: Harvest rules in this category are strictly administrative issues such as compliance with sector rules and delineation of sector manager responsibilities. These harvest rules generally shift the burden of reporting from individual sector members to the sector manager. However, they are not expected to materially affect the mix of gear used by fishermen, CPUE, the number of geardays fished, or fisheries related mortality.

Gear Restriction: These restrictions would have little impact on landings. The restrictions ensure operations do not result in new negative impacts to habitats or protected resources. They also ensure that gear used by the sectors is generally similar to the gear used by the common pool.

NMFS analyzed and approved the universal exemptions under Amendment 16. Therefore, they are not subject for approval in this action. NMFS approved the universal exemptions in Amendment 16 because they are effort controls that are no longer necessary to control fishing mortality resulting from sector operations. Therefore, they are not anticipated to impact allocated target or non-allocated target species since approved sector catch is managed by an ACE – a hard mortality control. Given that all sectors were expected to apply for them, this process simplified the annual sector approval process. The following summarizes the likely impacts from the universal exemptions, provided NMFS approves the sector operations plans under Alternative 1. The Amendment 16 FEIS and final rule provide further discussion concerning the impacts of approving these universal exemptions. FW 53 is proposing modifications to the rolling closure areas. Please see the EA for FW53 for further discussion and analysis on the impacts of proposed modifications to the rolling closures.

No Days-At-Sea Needed when Groundfishing: The Northeast Multispecies DAS system controls groundfish mortality by limiting fishing effort to a set number of days per groundfish vessel. Approved sectors have an ACE which serves as a hard mortality control and identifies the amount of fish that may be caught. Therefore, it is no longer necessary to apply DAS rules to this group of fishermen to control groundfish mortality. NMFS expects that operating under this universal exemption would allow vessels to successfully target select species. This would likely result in an increase in overall fishing time, as compared to the amount of time permitted under the DAS program for common pool vessels. Successful targeting of stocks with greater ACE (e.g., GB haddock) would allow sector vessels to spend more time fishing for more abundant stocks whose catch was artificially constrained by DAS allocations designed to reduce effort on stocks that are overfished and/or experiencing overfishing (e.g., GOM cod). A control on mortality (sector ACE), instead of a cap on DAS, may increase geardays for sector members, which could lead to more bottom contact time and more impacts to the physical habitat compared to the common pool. Mortality controls on allocated and non-allocated target species are not affected by this universal exemption. However, any potential increase in geardays, as a result of controlling mortality through a sector ACE would potentially result in an increased number of interactions between protected resources and deployed gear compared to the common pool, where geardays are set by the DAS regulations. Available data comparing geardays for FY 2012 against FY 2009 for sector vessels generally show geardays rising in aggregate; however, there is tremendous variability within the different gear types. The gears that are primarily used in the NE multispecies fishery (gillnet and trawl) have seen slightly increased geardays. The increased flexibility afforded by this universal exemption is likely to increase revenues, allow fishermen to more fully exploit previously under-exploited stocks, and reduce incentive to fish in unsafe conditions.

No Trip Limits: Trip limits are designed to limit the number of fish caught per trip. Trip limits on allocated target species may result in regulatory discards of fish that exceed relevant daily trip limits. Operating under a universal exemption from this restriction may result in less discards from sector operations, and increased landings and efficiency when combined with the overall mortality controls (sector ACEs). Similar to the no DAS universal exemption above, this may result in increased geardays as compared to the common pool, which may lead to more impacts to the physical environment, and lead to more interactions with protected resources. When common pool fishermen reach a trip limit for a certain species, they are obligated to discard any additional, marketable catch of that stock from that trip in order to comply with trip limits. This is referred to as "regulatory discard." Since sector members' catch would be regulated by the sector's ACE, trip limits are not needed as an effort control on mortality. Regulatory discard of allocated target and non-target species may be eliminated resulting in a higher proportion of the catch being retained compared to the common pool. This universal exemption allows sector participants the flexibility to extend fishing efforts to realize a higher return on those efforts during high harvest periods. This increased flexibility is likely to increase revenues, allow fishermen to more fully exploit previously under-exploited stocks, and reduce incentive to fish in unsafe conditions.

Seasonal Closed Area on Georges Bank in May: This restriction sought to reduce fishing mortality on GB stocks, particularly GB cod. The closure has also served to reduce fishing activity on cod spawning aggregations. This universal exemption allows fishing on Georges Bank during a month that may have a higher abundance of fish. Sector operations under this exemption should not increase overall bottom contact time. Geardays on Georges Bank will not likely increase since sector ACEs constrain overall mortality. Previously, many vessels chose to begin their required 20-day block out of the fishery at this time. Under this universal exemption, the time out of the fishery could be taken during another time period, but would still need to be taken (unless specifically exempted). As stated, approved sectors ACEs would limit mortality of allocated target stocks. Therefore, mortality of GB stocks would be limited regardless of the exemption. Vessels not actively fishing for allocated target stocks are still allowed on Georges Bank in May to fish for other fisheries, including non-allocated target species. Therefore, the disturbance to cod spawning aggregations is not completely avoided when compared to the common pool. This universal exemption should increase efficiency and vessel profits.

Gulf of Maine Rolling Closures: This universal exemption would allow fishing within areas that are otherwise closed to groundfishermen during specific time periods. Sector vessels are exempted from all rolling closures except for: Blocks 124 and 125 in April; Blocks 132 and 133 in April-May; Block 138 in May; Blocks 139 and 140 in May-June; and Blocks 145, 146,147, and 152 in June. GOM rolling closures were primarily adopted to reduce catches of allocated target species, particularly GOM cod. However, these closures have also served to reduce fishing activity on cod spawning aggregations. Sector fishing activities in these areas could result in increased catch of or disturbance to spawning fish. This universal exemption could also result in sector vessels targeting more allocated target species in areas where past fishing effort focused on other fisheries. Vessels not actively targeting groundfish, but fishing for other species, are currently allowed in the GOM closure areas in

May. Therefore, the GOM rolling closures do not completely avoid disturbance to cod spawning aggregations. This exemption should not increase overall bottom contact time since overall fishing effort is confined by sector ACLs, and effort would likely shift to other areas without this exemption. In addition, these areas do not include any habitat area of particular concern. Increased access to the GOM fishing grounds during spring and fall should increase CPUE and may allow vessels to more fully exploit previously under-exploited stocks. It also provides sector vessels access during a time when few grounds are open leading to increased opportunities. This would in turn lead to increased vessel profits likely resulting in a positive effect on both human communities. However, if the threshold of harbor porpoise take is exceeded, closures may be triggered for all sink gillnet vessels (i.e., groundfish and non-groundfish alike).

Six-inch Cod-end Exemption on Georges Bank if using Haddock Separator or Ruhle Trawl: This exemption allows the use of a six-inch mesh cod-end when sector vessels fish with selective trawl gear (haddock separator or Ruhle trawl). The exemption facilitates selective fishing for haddock by sector vessels because both the separator and Ruhle trawls increase the proportion of haddock caught compared to cod. Sector operations under this exemption should not substantially change mortality since the catch would be controlled by sector ACE. This exemption may increase harvest of sub-legal size fish. However, this is less likely to affect species that swim closest to the bottom (e.g., cod) because of the net's design. Although, it is possible that increased retention of sub-legal catch may cause shifts in stock composition. Since these modified trawls have less contact with the seafloor, sector operations under this exemption should not affect habitat, as gear contact time with the seafloor would not increase as a result of these trawls. The minor reduction in mesh size should not alter the expected rate of protected resources entanglement. The use of this exemption by sector vessels would increase profit margins by allowing fishermen to more fully exploit previously under-exploited stocks.

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Sector operations plans (Alternative 1) would generally have a negligible impact on the physical environment and protected resources as they are not the primary driver of effort in the fishery. As Sector operation plans (Alternative 1) have been in place since 2010, and fishing behavior will be confined to areas that: 1) are already subject to fishing by multispecies gear (e.g., gillnet and trawl) in the GOM, GB, SNE, and Mid-Atlantic and therefore, in areas which have been considered by NMFS in its assessment of fishery effects to protected species (ESA and non-ESA listed species), and 2) have been determined to be areas where takes are not expected to so great that the continued existence of the species is jeopardized (NMFS 2013; Waring *et al*. 2014), we do not expect the continued authorization of the sector operation plans to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al*. 2014). The amount of fish allocated to the commercial groundfish fishery, and sectors in the form of an ACE, as set in the annual specifications, likely provides for the greatest influence on trips, catch, and geardays. Additionally, sector operations plans are intended to ensure that operations do not result in new negative impacts to the physical environment and/or protected resources. The operational flexibility afforded to sectors (i.e., exemptions to increase fishing opportunities) may allow for an increase in geardays from targeting under-exploited stocks. However, the analyses in this document are made assuming the entire ACE could be harvested. In other words, an increase in catch from the previous year, as long as it does not exceed the ACE, should not create an unanticipated impact. It is also possible that increased efficiency resulting from sector exemptions could also act to increase catch per unit effort and reduce days fished.

Data in Section 4.1.6 from FY 2009 through FY 2013 (trips targeting groundfish or using a groundfish or monkfish DAS), broken out by gear type, show a major reduction in trips, and catch, while geardays have fluctuated, but recently decreased across gear types. This data could indicate that it is becoming harder to find stocks, and therefore, vessels are having to fish harder, or longer. The approval of sector exemptions in the past may have contributed to greater efficiencies that allow for increased exploitation of ACE, and non-allocated stocks. This may account for the increase in geardays in the gillnet fishery seen in previous years. As discussed under the exemption impact discussion (section 5.1.4), any increase in the use of trawl gear is a negative for benthic habitat (see Section 4.2.4); any an increase in gillnet, trawl, and/or trap/pot gear is a negative for protected resources. The majority of the harvest rules are not expected to affect the landings of non-allocated target species and bycatch, therefore impacts to this VEC would be negligible. Since sector vessels would likely convert vessel catch into more landing and less discard while not exceeding ACEs, impacts to allocated target species as a result of Alternative 1 would be expected to be negligible. As sectors may lease their stock-specific ACE to any approved sector, and since common pool members may join an active sector up until the last day of the previous fishing year (e.g., April 30, 2015), this EA assumes that 100 percent of the ACL allocated to the fleet may be fished by any individual sector with an approved operations plan.

The harvest rules would allow participants the flexibility to time fishing efforts to correspond with optimal market and or environmental conditions while not exceeding ACE. This increased flexibility is likely to increase revenues, allow fishermen to more fully exploit previously under-exploited stocks, and reduce incentive to fish in unsafe conditions. As such, impacts to human communities would be positive.

Most sectors included a provision in their operations plans that prohibits a sector vessel from fishing outside of Broad Stock Area 1 (the entire Gulf of Maine) if it fishes west of 70° 15'W. This provision, referred to as the "Inshore Gulf of Maine Declaration" requires sector vessels to declare their intention to fish "inshore" or "offshore" prior to departure. Vessels declaring an "inshore" trip can fish anywhere in Broad Stock Area 1. Vessels declaring an "offshore" trip can fish anywhere in the Gulf of Maine, Georges Bank, or south, except for inshore Gulf of Maine west of 70° 15'W. Vessels with an observer or at-sea monitor on board would be permitted to fish in any and all of the Broad Stock Areas on a single trip. This provision was developed by several sectors to help managers better identify where vessels are fishing. It will allow for better identification of catch as vessels fishing inshore Gulf of Maine are unable to fish in a different stock area. For example, Gulf of Maine cod caught inshore cannot be mis-reported as Georges Bank cod. This provision would not apply to a vessel with an observer or at-sea monitor on board because the observer records catch location.

Data from FY 2011 indicates that very few trips included active fishing outside of Broad Stock Area 1 (the entire Gulf of Maine) and west of 70° 15'W on the same trip. VMS data indicates that 29 trips did this from May 1, 2010 through November 2012. While VTR records for some of these trips could not be linked to specific trips, for those trips where VTR data could be matched, the results indicated that these trips caught 72,667 lb of GOM Cod, and 46,640 lb of cod from outside of the GOM.

Therefore, since this provision is not expected to substantially change fishing behavior, impacts to the physical environment/habitat/EFH and protected resources are likely to be negligible. This provision would have low positive impacts on allocated target species and non-target species as it would result in improved data on these species. Impacts on human communities would likely be negligible. There is the potential for a decrease in flexibility for some vessels that would fish on Georges Bank and then the Gulf of Maine on the same trip. However, the analysis indicates that this would affect very few vessels. Further, since this program is voluntary and vessels could still fish in the Gulf of Maine, impacts are considered negligible.

Amendment 17 to the Northeast Multispecies FMP allows for NOAA-sponsored state-operated permit banks to lease ACE without first becoming or joining sectors Several State permit banks have existing MOAs with NMFS, and have the following generally positive impacts human communities: Secure continued access to fishery resources for fishermen regardless of their groundfish fishing history; create and protect sustainable local fisheries; and mitigate the effects of fishing effort consolidation on small-scale fishermen.

As described in the analysis conducted for the authorization of state-operated permit bank sectors under FW Adjustment 45, there exists the potential that state permit banks may affect the market price associated with the vessels/permits for purchase, and DAS and sector ACE available to lease. Currently, the entire funding state permit banks have or would use to purchase permits was received through Federal grants. It could be argued that state permit banks are not as driven by the need to assure a particular return on investment when compared to a private fishing business whose capital to purchase permits is derived from commercial loans. Thus, state permit banks may be able to afford to offer higher prices for available permits than private commercial entities. As a result, the price for purchasing a vessel/permit may be inflated by the development of these state permit banks. Furthermore, state permit banks could offer DAS and sector ACE on the leasing market for comparably cheaper prices than a private commercial entity. In fact, state permit banks were created to provide assistance to smaller fishing vessels and communities. Permit holders who are not able to lease DAS or ACE from state permit banks could see reduced access to further fishing opportunities as a result of state permit banks. However, the distribution of such impacts would vary based on the communities and sectors eligible to receive DAS or sector ACE from the permit banks based upon the conditions specified in the MOAs. Further, the scale of the impact of such an effect on the market price for permits may be mitigated by the availability of permits with larger landings histories or DAS allocations. If permits with larger landings histories or DAS allocations are not available, as suggested in the analysis of FW 45, purchasing additional permits or leasing additional DAS or sector ACE could only marginally increase future fishing opportunities.

Although the state-operated permit banks have the potential to affect market prices for permits, DAS, and sector ACE, and, therefore, the costs of permit acquisition or leasing DAS and sector ACE, the positive social benefits that would result from the ability of these banks to acquire and lease ACE to other sectors would likely outweigh these potential market impacts. Furthermore, any market impacts from state permit banks purchasing permits are likely to be short term. The ability of these banks to lease ACE would achieve several social objectives identified in the FMP, including minimizing the adverse impacts on fishing communities and shoreside infrastructure and maintaining a diverse groundfish fishery. Additionally, the state permit banks would increase DAS and sector ACE available to smaller sector vessels operating out of smaller communities. Thus, the operation of the state-operated permit banks would help minimize adverse impacts on such communities and allow for their sustained participation in the groundfish fishery, and overall the ability of sectors to acquire ACE from permit banks would result in positive impacts to human communities.

As this is a programmatic analysis, it is assumed that sectors would continue to operate similarly into the future. Data show little change in fishing behavior over the past few years. It is therefore assumed that the continuation of approval of operations plans for sectors will have similar impacts as described in this document for the period assessed. If this is not the case, additional NEPA analysis may be required.

If the No Action Alternative is selected for Alternative 1, sectors would not have approved operations plans. Therefore, vessels participating in the Northeast Multispecies fishery would return, or remain in the common pool where they would fish under DAS regulation. The No Action Alternative would subject these vessels to the input control measures, implemented by Amendment 13, subsequent framework adjustments, and Amendment 16. As described above, the primary driver of effort in the multipspecies FMP is not the sector operations plans, and therefore, the impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources would be negligible. Since groundfish fishermen would not benefit from the increase operational flexibility expected under sector management selecting the No Action Alternative for Alternative 1 would represent negative impacts on human communities. Additionally, if NMFS does not approve operations under Alternative 1, there would be minimal impact from the ability of a NOAA-sponsored, state-operated permit bank to acquire or lease ACE, as they would have no ability to fish this ACE per the MOA or to lease ACE to sectors.

5.1.4 Impacts of Sector Operations Plans Exemptions (Alternative 2)

Section 5.1.4 describes the impacts of approving exemptions requested by FY 2015/16 sectors. This EA evaluates the impacts of each exemption individually and NMFS may approve or disapprove them individually or as a group. Section 3.3 provides additional detail on the regulatory history leading up to each exemption request. While the impacts associated with the implementation of each of the exemptions in this EA are analyzed as if each exemption would be implemented for all sectors, each exemption will only be implemented for those sectors which request them. This document is a programmatic EA that analyzes the continued operation of sectors through the 2020 fishing year. As such, future exemption approvals during this timeframe would be analyzed in terms of their impacts compared to the following exemptions. See the discussion in Section 5.1.1.3 for the programmatic approach to sector operation analysis.

1. *120 Day Block Out of the Fishery Requirement for Day Gillnet Vessels*

Under existing regulations, gillnet vessels must take a total of 120 days out of the gillnet fishery during the fishing year. Each period of time taken must be a minimum of 7 consecutive days. At least 21 days must be taken between June 1st and September 30th of each fishing year. A required 20-day spawning season time out period is also credited toward the 120 days out of the gillnet fishery. The block out requirements were implemented as a means of controlling mortality and to reduce the possibility that gillnet vessels could compensate for other effort reduction measures by extending soak time between trips. The requirement to take time out during the summer months sought to apply the time out requirement when seasonal gillnet activity is highest.

Because sector members would operate under an ACE, an exemption would increase the operational flexibility of sector vessels while maintaining the mortality control rationale for the measure. The increased flexibility could result in effort being distributed more evenly throughout the year and may increase the CPUE and thereby decrease fishing time and bottom contact for the fishing gear. Since sector gillnet vessels would operate under an ACE, a minor increase in CPUE would generally result in fewer geardays. However, the ability to target specific stocks may result in an increase in geardays. Therefore, this assessment conservatively assumes that this exemption would result in a minor increase in geardays as sector gillnet vessels would have the ability to fish during an additional 120 days if ACE were not attained.

Impacts to the physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch are likely to be negligible. It is likely that the impacts to the physical environment/habitat/EFH would be negligible despite a possible increase in geardays because gillnets have a low impact on habitat. Negligible impacts to allocated target species would occur because harvest is controlled by ACE and potential impacts to spawning aggregations are limited by other existing regulations (e.g. rolling closure areas) and by lowering quality and price of spawning fish that provide a disincentive to target spawning aggregations. Likewise, assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, there would be negligible impacts as ACE would limit the potential for impacts to non-allocated target species and bycatch. Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality regardless of the time of year.

The ability for sector vessels requesting an exemption from gillnet limits to fish up to 150 nets total in each RMA is consistent with the monkfish FMP. Monkfish mortality is also limited by DAS and trip limits. Fishing effort on skates is further restricted by trip limits. Landing dogfish does not require the use of a DAS, but sector vessels would still be restricted by landings limits and quotas.

An increase in gillnet geardays could increase interactions with protected resources. While participants would be required to adhere to all applicable gillnet gear restrictions (i.e., HPTRP and ALWTRP), the exemption may have a low negative impact on protected resources due to the potential for increased geardays. However, it is important to note, that since this exemption's implementation in 2010, takes to protected species have not gone above and beyond those have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014) and thus, beyond a level that threatens or jeopardizes the continued existence of any protected species.

In contrast, increasing operational flexibility, while maintaining the mortality control rationale for the measure would, increase the expected profit margins of sector fishermen. This would represent a low positive impact on human communities.

Under the No Action Alternative for this exemption, Day gillnet vessels belonging to sectors would still have to declare 120 days out of the fishery. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch would likely be negligible. Impacts to protected resources would be low positive as it is possible that under no action there would be less geardays, and less potential for interactions with protected resources. Impacts to human communities would be low negative as additional flexibilities would not be realized.

2. *20-Day Spawning Block*

All Northeast groundfish vessels are required to take 20 days out of the fishery between March 1 and May 31 of each year. The 20-day block out rule was imposed as a mortality-control measure and with associated benefits to provide protection for spawning aggregations.

Sectors have requested that they be exempted from the 20-day spawning block. This would allow effort to shift to the spring when CPUE may be increased. Since sector members would operate under an ACE, a minor increase in CPUE could result in fewer geardays. However, the ability to target specific stocks may also result in an increase in geardays; because the exemption is limited to 20 days, it is likely that any potential increase in geardays would be minor.

The following table illustrates the number of trips taken between March 1 and May 31, by sector vessels that declared a 20 day spawning block in FY 2009 but were exempt from the requirement in FY 2010-2013. Vessels that do not declare a 20-day spawning block through the IVR system are not allowed to fish between May 12 and May 31. Since these vessels could not be identified, this analysis does not include vessels that did not call in a 20 day spawning block in 2009.

Table 67. Trips and Catch for Vessels with at Least 1 Block Declaration by Year and Gear. Vessel had Sector Membership in FY 2010, 2011, 2012 or FY 2013. Trips were taken between March 1 and May 30, 2009-2013.

Gear	Fishing Year	Trips	Catch (lbs)
Gillnet	2009	278	1,049,318
	2010	1,535	4,565,721
	2011	884	2,582,725
	2012	976	3,290,530
	2013	579	2,189,690
Longline	2009	45	263,882
	2010	130	382,511
	2011	168	387,307
	2012	215	234,065
	2013	79	30,891
Trawl	2009	763	5,545,110
	2010	3,359	29,148,782

	2011	2,490	28,495,983
	2012	2,754	30,763,509
	2013	2,641	22,732,505

It is clear that vessels used this exemption over the past few years. The above data show that trips and catch were substantially higher during the last few years when vessels were using the exemption compared to FY 2009. The number of vessels declaring the spawning block also declined from 494 in FY 2009, to 405 in FY 2010 to 35 in FY 2011, 7 vessels in 2012, and 6 in 2013.

Exempting vessels from the 20-day spawning block may increase disturbance to or harvest of actively spawning groundfish and/or disrupt spawning behavior. This would have a proportionally greater effect on stock production than harvest of non-spawning fish. However, the lower quality and lower price of spawning fish creates a disincentive for vessels to target them. An exemption from this restriction would not necessarily directly result in increased effort in the Gulf of Maine on spawning stocks, as vessels could fish on Georges Bank or southern New England instead. Furthermore, exempt vessels would still be subject to the GOM Rolling Closure Areas, which are specifically designed to protect spawning aggregations.

Impacts to the physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch are likely to be negligible. Physical environment/habitat/EFH impacts would likely be negligible because any potential increase in geardays would be minor. While this exemption may increase fishing effort at a time and in areas where fish are aggregating to spawn, the ACE for each allocated target stock predominantly controls the potential impact of this exemption. Once a sector reaches its ACE for any allocated target stock, sector members must stop fishing in that stock area with any gear capable of catching groundfish unless additional ACE is obtained. In addition, exempt vessels would still be subject to the GOM Rolling Closure Areas, which are specifically designed to protect spawning aggregations as well as market pressures which may reduce incentives to target spawning stocks. Based on the assumption of a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACEs would also function as a dominant control to limit impacts to non-allocated target species and bycatch.

While any potential change in geardays would be minor, even a minor increase in geardays could result in increased interactions. Altough participants would be required to adhere gear requirements as outlined in the HPTRP and ALWTRP, this exemption may still result in a low negative impacts on protected resources. However, it is important to note, that since this exemption's implementation in 2010, takes to protected species have not gone above and beyond those have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014) and thus, beyond a level that threatens or jeopardizes the continued existence of any protected species.

In contrast, by increasing operational flexibility while generally maintaining the mortality control rationale, for the measure the exemption would increase the expected profit margins of sector fishermen. This would represent a low positive impact on human communities.

Under the No Action Alternative for this exemption, vessels belonging to sectors would still have to declare 20 days out of the fishery between March 1 and May 31. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch would likely be negligible. Impacts to protected resources would be low positive as under no action there may be less geardays resulting in less potential for interaction with protected species. Impacts to human communities would be low negative as additional flexibilities would not be realized.

3. *Limitation on the Number of Gillnets for Day Gillnet Vessels*

Current regulations restrict Day gillnet vessels from fishing more than: 100 gillnets (of which no more than 50 can be roundfish gillnets) in the GOM RMA; 50 gillnets in the GB RMA; and 75 gillnets in the SNE/MA RMAs. The existing gillnet limit was implemented to reduce fishing effort and fishing mortality. It also had the effect of reducing the potential that gear would be left unattended to "hold" fishing ground.

Sectors have requested an exemption to increase the limit on the number of gillnets imposed on the Day gillnet category to 150 nets per permit in all RMAs. While sector members would operate under an ACE, the proposed exemption could result in longer soak times because it may take more time to retrieve and process the nets. In turn, this could decrease CPUE as longer soaks could result in undocumented groundfish mortality due to losses such as predation and net drop-out. Because fish that drop out or are entirely consumed by predators would not be counted against ACE, the decrease in CPUE could result in an increase in geardays and increased fishery mortality. This potential is mitigated because untended gillnets can lead to loss of nets, providing an incentive for fishermen to haul nets more frequently. Data seems to indicate that in FY 2010 through FY 2013 vessels that were eligible to use this exemption did use it.

Table 68. Geardays While Fishing Under the Number of Gillnets for Day Gillnet Vessels Exemption

RMA	Fishing Year	Geardays
GB	2009	7,570,533
	2010	2,323,064
	2011	9,165,420
	2012	10,677,469
	2013	2,034,380
GOM	2009	3,863,358
	2010	2,114,596
	2011	192,165
	2012	4,219,638
	2013	6,331,538
MA	2009	180,063
	2010	94,816
	2011	76,827
	2012	-
	2013	
SNE	2009	1,513,947
	2010	4,411,002
	2011	5,390,472
	2012	34,693,135
	2013	31,751,947

Impacts to the physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch are likely to be negligible to low negative. The likely negligible impact to the physical environment/habitat/EFH would be expected despite a possible increase in geardays because gillnets have a low impact on habitat. Likely negligible to low negative (see discussion below concerning GOM Cod) impacts to allocated target species would be expected because harvest would be controlled by ACE. However, NMFS is concerned that additional net use within the GOM could create more opportunities for harvest of GOM Cod – specifically cod that are aggregated near the walls of proposed or current groundfish or cod closed areas. Due to the current condition of GOM cod, this exemption may contribute to negative impacts on GOM cod if it causes additional effort within these aggregations leading to more discard. Net drop-out and predation could result in some fish not counting against the ACE, however, sector rules, along other economic incentives and the fact that damaged fish count against the sector's ACE, mitigate this potential.

Likewise, assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACEs would likely limit the potential for impacts to non-allocated target species and bycatch. As discussed, data generally show a relatively constant catch of non-target and monkfish, skate, and dogfish for sector vessels who were fishing on sector trips without a monkfish DAS. Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality regardless of the time of year. The use of up to 150 nets total in each RMA is consistent with the monkfish FMP. Monkfish mortality is also limited by DAS and trip limits. Fishing effort on skates is restricted by trip limits. Landing dogfish does not require the use of a DAS, but sector vessels would still be restricted by landings limits and quotas.

The increase in the number of gillnets allowed in the water at one time and the potential for an overall increase in geardays could increase interactions with protected resources. However, it is important to note, that since this exemption's implementation in 2010, takes to protected species have not gone above and beyond those have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014) and thus, beyond a level that threatens or jeopardizes the continued existence of any protected species.. Altough participants would be required to adhere gear requirements as outlined in the HPTRP and ALWTRP, the exemption may still have the potential to have a low negative impact on protected resources.

The increased operational flexibility would increase the expected profit margins of sector fishermen, thereby resulting in low positive impacts to sector participants. However, exempting sector vessels from the gillnet measures could result in gear being left to hold fishing ground which could increase inter-vessel conflicts. As such, implementation of this exemption would represent a low negative impact to ports.

Under the No Action Alternative for this exemption, Day gillnet vessels belonging to sectors would be limited to: 100 gillnets (of which no more than 50 can be groundfish gillnets) in the GOM RMA; 50 gillnets in the GB RMA; and 75 gillnets in the SNE/MA RMAs. Impacts to physical environment/habitat/EFH, , non-allocated target species and bycatch would likely be negligible. Impacts to allocated target species may be low positive if the no action provided protection against increased gillnet use within areas important for the GOM cod stock. Impacts to protected resources would be low positive as geardays and potential interactions with protected species may be lower for the rationale given above. Ports would be low positive because there would be less chance of gear conflicts under no action. Impacts to sector participants would be low negative as additional flexibilities would not be realized under no action.

4. *Prohibition on a Vessel Hauling Another Vessel's Gillnet Gear*

Current regulations require vessels to deploy and haul their own gillnets. The regulations were established to facilitate the enforcement of existing regulations and also act as a mortality control measure by reducing geardays. This exemption would allow one sector vessel to deploy stand-up and tie-down gillnet gear and to have a second vessel from the same sector tend the gear while the first returns to port.

The increased flexibility afforded by this exemption may increase CPUE. An increase in CPUE coupled with ACE would tend to decrease geardays. There is also some potential that net sharing may lead to a reduction in the number of nets deployed at one time relative to vessels deploying and retrieving nets individually. However, the proposed exemption could result in longer soak times if community gear is attended to less faithfully than individual gear. This could decrease CPUE as longer soaks could result in undocumented groundfish mortality due to losses such as predation and net drop-out. Because fish that drop out or are entirely consumed by predators would not be counted against ACE, the decrease in CPUE could result in an increase in geardays and increased fishery mortality. This potential is mitigated because fishermen would still need to comply with federal law and because untended gillnets can lead to loss of nets and damaged fish still count against a sector's ACE, providing an incentive for fishermen to haul nets more frequently.

As such, for the purpose of this assessment it is assumed the exemption is likely to result in a negligible impact on CPUE, soak times, ghost fishing [lost or abandoned gear that continues to fish (FAO 2010)], and geardays. Resulting impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources are likely to be negligible.

The increased operational flexibility would increase the expected profit margins of sector fishermen, thereby resulting in low positive impacts to sector participants. However, the use of community fixed gear could result in gear being deployed to "hold ground" which could increase inter-vessel conflicts. As such, implementation of this exemption would represent a low negative impact to ports.

Under the No Action Alternative for this exemption, sector vessels would have to deploy and haul their own gear. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources would likely be negligible for the rationale given above. Impacts to sector participants would be low negative as additional flexibilities would not be realized, and impacts to ports would be low positive because the potential to hold ground by deploying gear would be reduced.

5. *Limitation on the Number of Gillnets That May Be Hauled on Georges Bank When Fishing Under a Groundfish/Monkfish DAS*

Vessels fishing under a groundfish/monkfish DAS may haul only 50 nets per day when fishing on Georges Bank. The limit was implemented as a groundfish mortality control. The requested exemption would not permit the use of additional nets; it would allow nets deployed under existing net limits (a maximum of 150 nets), according to the Monkfish FMP, to be hauled more efficiently by vessels dually permitted under both FMPs. The exemption would only apply when specifically targeting monkfish under the Monkfish FMP on Georges Bank. Data indicate that vessels that were eligible to use this exemption did use it; however, it is not possible to completely attribute this data specifically to the use of this exemption. Other exemptions, or changes in ACE may be responsible for these declines in gillnet geardays among vessels fishing with more than 50 gillnets in the GB RMA with a monkfish DAS.

Table 69. Geardays for Gillnet Vessels Eligible for Exemption (gillnet vessels fishing with more than 50 gillnets in GB on Groundfish/Monkfish DAS)

SEASON	Fishing Year	Geardays
SPRING	2009	252,072
	2010	-
	2011	466,256
	2012	5,360,984
	2013	1,292,745
SUMMER	2009	1,291,792
	2010	1,390,040
	2011	3,346,460
	2012	1,811,569
	2013	162,813
FALL	2009	4,418,557
	2010	470,874
	2011	1,954,764
	2012	2,322,182
	2013	213,128
WINTER	2009	1,608,113
	2010	414,075
	2011	1,578,986
	2012	-
	2013	-
Total	2009	7,570,533
	2010	2,274,989
	2011	7,346,467
	2012	9,494,735
	2013	1,668,685

The net hauling restriction serves to distribute a fixed fishing effort among more fishermen. Because sector members would still be bound by ACE and existing net limits, the exemption would allow them to increase efficiency relative to fishing under DAS. Since the number of nets would not increase, geardays are unlikely to increase. As such, impacts to the physical environment/habitat/EFH and protected resources would be negligible.

The impacts of this exemption on allocated target stocks would be limited by sector use of the exemption only when specifically targeting monkfish under the Monkfish FMP. Additional net use while targeting monkfish could increase the bycatch of allocated target stocks during a monkfish DAS for exempt sector participants compared to non-exempt fisherman. However, the allocated target stocks caught while targeting monkfish would count against the sector's ACE for those stocks. Therefore, the implementation of this exemption for all sector gillnet vessels would result in a negligible impact to allocated target stocks.

Additional net use while targeting monkfish could increase the catch of monkfish as well as the bycatch of skates and dogfish. However, non-allocated target species and bycatch have management measures in place to limit their catch and control mortality; monkfish and skate harvest are limited by DAS and trip limits and dogfish impacts are regulated by pounds-per-trip landings limits and quotas. Overall, low negative impacts to non-allocated target species and bycatch resulting from this exemption would occur when applied to all sectors.

Because sector members operate under an ACE, this exemption would increase operational flexibility when fishing under a DAS while maintaining the mortality control rationale for the measure. Implementing this exemption for all sectors would increase flexibility and profit margins resulting in a low positive impact on human communities.

Under the No Action Alternative for this exemption, sector vessels fishing under a groundfish/monkfish DAS would be allowed to haul only 50 nets per day when fishing on Georges Bank. Impacts to physical environment/habitat/EFH, allocated target species, and protected resources would be negligible. Impacts to non-allocated target species and bycatch would be low positive as there would be less of an opportunity to target non-allocated stocks such as dogfish with less net use allowed. Impacts to human communities would be low negative as additional flexibilities would not exist under no action.

6. *Limitation on the Number of Hooks That May be Fished*

The existing hook limit restriction functions to reduce fishing effort, reduce fishing mortality, and reduce the potential that gear could be used to "hold" fishing ground. This exemption seeks to remove hook limits on sector vessels.

The increased operational flexibility may increase CPUE by allowing vessels to increase their harvests during times when fish are more abundant. An increase in CPUE restricted by a fixed allocation (ACE) would tend to decrease geardays. In addition, and as discussed in the Affected Environment Section, data from FY 2014 over FY 2009 for longline gear tends to show a major decrease in geardays for the majority of vessels fishing with this gear type. However, exempting sector vessels from the hook limit measure could result in longer soak times or gear left unattended to hold fishing ground which could result in groundfish mortality that is neither reported nor applied to sector ACE. For the purpose of this assessment it is conservatively assumed the exemption would result in a minor increase in hook days.

The impact of any potential change in hook days is mitigated by the relatively small percentage (15 percent) of sector vessels that operate a mix of gear which includes bottom longlines, hooks, traps, and pots. In addition, hook fishing is noted by NMFS to strongly limit catch of "flatfishes," which are the category of stocks of greatest conservation concern. Exemptions that could shift effort toward hook fishing have the potential to protect weaker stocks of flatfish and thus provide some conservation benefits to these species relative to targeting the multispecies complex with some other gear types.

Impacts to physical environment/habitat/EFH, allocated target stocks, and protected resources would be negligible and impacts to non-allocated target stocks and bycatch would likely be negligible. Impacts to physical environment/habitat/EFH and protected resources would be negligible due to the minimal expected change in geardays and the low level of impact associated with hook gear. Potential impacts to allocated species are limited by ACE, offsetting incentives to increase soak time, and the low proportion of the fleet that utilizes hook gear. Similarly, ACE is likely to limit potential impacts to non-allocated target species and bycatch under the assumption of a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks. In addition, non-allocated target species and bycatch have management measures in place to limit their catch and control mortality, with which sector vessels would still be required to comply.

The increased operational flexibility would increase the expected profit margins of sector fishermen, thereby resulting in low positive impacts to sector participants. However, increasing the number of hooks fished by each vessel could result in gear being deployed to "hold ground" which could increase inter-vessel conflicts. As such, implementation of this exemption would represent a low negative impact to ports.

Under the No Action Alternative for this exemption, sector hook vessels would be limited in the number of hooks they fish. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch and protected resources would be negligible or likely negligible for the rationale given above. Impacts to sector participants would be low negative as additional flexibilities would not occur under no action. Impacts to ports would be low positive because the potential to hold ground by deploying gear would be reduced.

7. *Length and Horsepower Restrictions on DAS Leasing*

Currently multispecies vessels are allowed to lease DAS from other vessels provided they meet the restrictions of the DAS Leasing Program concerning vessel length and horsepower. The intent of the restriction is to maintain the character of the fleet. Sectors have requested an exemption to allow DAS leasing to vessels in other approved sectors with this exemption irrespective of length and horsepower.

This exemption is related to retention of monkfish and skates harvested while vessels participate in the multispecies fishery. Sector vessels are exempt from the requirement to use a Northeast Multispecies DAS to harvest groundfish, but sector vessels are still allocated NE multispecies DAS to use in complying with provisions of the Monkfish and Skate FMPs. While groundfish sector fishermen would be exempt from the use of DAS to catch allocated target species, they would still need to expend groundfish DAS to land and retain an increased quantity of monkfish or skates under some circumstances.

This exemption would not be expected to increase fishing effort as the total number of DAS allocated to the fishery would not increase. Impacts to physical environment/habitat/EFH and protected resources would be negligible as geardays are not expected to change. Similarly, ACE and DAS regulation would ensure negligible impacts to allocated target species, and non-allocated target species and bycatch by capping overall mortality. In addition, non-allocated target species and bycatch have management measures in place to limit their catch and control mortality, with which sector vessels would still be required to comply.

The exemption from DAS leasing restrictions would result in low positive impacts to human communities as it would expand the pool of vessels that sectors could lease DAS. After this exemption was originally approved, data showed that it was utilized. While the character of the fleet could change somewhat if sectors are exempted from DAS leasing restrictions, these changes may occur without this exemption because ACE can be fished by vessels of any size. This potentially negative factor is more than offset by the potential for increased vessel profitability and the positive effect that revenue would have on ports resulting in a low positive impact on ports.

Under the No Action Alternative for this exemption, sector vessels would be subject to length and gear restrictions when leasing DAS within and between sectors. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch and protected resources would be negligible for the reasons given above. Impacts to human communities would be low negative as additional flexibilities would not occur under no action.

8. *Prohibition on Discarding*

Current regulations prohibit sector vessels from discarding any legal-sized fish of allocated stocks. The requirement was intended to ensure accurate monitoring of sector ACE.

As a result of these regulations, sector vessels have to store catch that may be damaged or contaminated in separate totes on deck in order to keep unmarketable catch separate from the food grade product. These additional storage totes can compromise fisherman safety and/or potentially destabilize the boat.

Once in port, the disposal of unmarketable fish can pose an economic challenge. A comparison of data from FY 2012 to FY 2013 show that trips that reported keeping unmarketable species fell as did live pounds. The amount of unmarketable fish that a vessel brings in on a single trip varies by gear type. These reductions in discard are likely attributed to the reductions in overall ACL from FY 2010 to FY 2013 and a reduction in the minimum size for several stocks in FY 2013.

Table 70 - Legal-Sized Unmarketable Fish

	Trip Count				Live Pounds				Trip Count Change (%)			Live Pounds Change(%)		
LUMF	**2010**	**2011**	**2012**	**2013**	**2010**	**2011**	**2012**	**2013**	**FY10 - FY11**	**FY11 - FY12**	**FY12 - FY13**	**FY10 - FY11**	**FY11 - FY12**	**FY12 - FY13**
LUMF Discard	871	1,221	737	586	39,954	70,391	35,355	35,063	45%	-34%	-27%	69%	-49%	-11%
LUMF Kept	219	56	16	7	20,865	5,001	1,560	358	-78%	-70%	-71%	-82%	-57%	-93%
LUMF Total	1,046	1,261	750	587	60,820	75,392	36,915	35,421	20%	-36%	-28%	17%	-49%	-15%

The requested exemption would allow sector vessels on a sector trip to discard unmarketable fish at sea. The exemption would apply to all vessels in the sector. Damaged fish that are discarded would be recorded by NEFOP observers or At-Sea Monitors on observed trips and incorporated into the sector's specific discard rates by stock and gear strata for unobserved trips. Since sectors are capped by an ACE, and discards count against ACE, the ability to discard fish at sea would not result in a change in gear mix, CPUE, fishing effort/geardays, or landings.

Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources would be likely to be negligible. Impacts to physical environment/habitat/EFH and protected resources would be negligible because geardays are not expected to change. Potential impacts to allocated target species are limited by the fact that discards are already deceased and would count against ACE. ACE is also likely to limit potential impacts to non-allocated target species and bycatch under the assumption of a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks. In addition, non-allocated target species and bycatch have management measures in place to limit their catch and control mortality, with which sector vessels would still be required to comply.

The increased operational flexibility is expected to increase safety and may increase the profitability of vessels and/or dealers. This would represent a low positive impact on human communities.

Under the No Action Alternative for this exemption, sector vessels would be required to bring any legal-sized fish of allocated stocks to port. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protect resources would be negligible or likely negligible for the reasons described above. Impacts to human communities would be low negative as additional flexibilities would not be realized.

9. *Daily Catch Reporting by Sector Managers for Vessels Participating in the Closed Area 1 Hook Gear Haddock SAP*

Sector vessels are required to submit daily reports to the Sector Manager while fishing in the Closed Area I Hook Gear Haddock SAP. The Sector Manager compiles these into a report and submits it daily to NMFS. The requested exemption would relax the requirement that sector managers submit a daily catch report to NMFS. Instead Sector Managers would require each vessel to submit their own report to NMFS via VMS.

As this is an administrative matter, an exemption from this regulation would have a negligible effect on physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources.

This exemption would reduce the administrative burden on Sector Managers. Although sector vessels which would have to submit reports through VMS to NMFS at a cost of approximately $0.84 per transmission, the fact that the exemption request has been submitted suggests that participants in the requesting sector would find daily vessel reporting advantageous. The exemption also makes the regulatory requirement consistent for vessels. Therefore, it is expected that this exemption would represent a low positive impact on human communities.

Under the No Action Alternative for this exemption, sector vessels would be required to submit daily reports to the Sector Manager while fishing in the Closed Area I Hook Gear Haddock SAP and Sector Managers would compile these into a report and submits it to NMFS. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protect resources would be negligible for the reasons described above. Impacts to human communities would be low negative as additional flexibilities would not be realized.

10. *Gear Requirements in the U.S./Canada Management Area*

In the U.S./Canada Management Area both the U.S. and Canada coordinate the management of transboundary fisheries stocks including GB cod, GB haddock, and GB yellowtail flounder. U.S. vessels in the U.S./Canada area are required to use gear that is designed to minimize the catch of cod (the stock which tends to reach its TAC first) and constrain catches of other stocks. These gear types currently include the haddock separator trawl and the Ruhle trawl. The gear requirements are intended to ensure that the U.S. does not exceed its share of U.S./Canada Area TAC particularly the GB cod TAC.

Sectors have requested an exemption to allow their vessels to use any type of trawling gear while fishing in the U.S./Canada area. The exemption is intended to increase CPUE by allowing all trawl gear types in the area. Since sector members would operate under an ACE, a minor increase in CPUE could result in fewer geardays. However, the ability to target specific stocks may also result in an increase in geardays. For the purpose of this assessment an increase in U.S./Canada Area trawl days is assumed.

Impacts to physical environment/habitat/EFH would be low negative. The low negative impact to habitat is the result of an increase in trawl days and the relatively adverse habitat impacts that are associated with trawling.

Impacts to allocated target species would likely be negligible because harvest is controlled by ACE, including separate ACEs for Eastern U.S./Canada Area cod and haddock. Likewise, assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACE would limit the potential for impacts to non-allocated target species and bycatch. However, stocks such as GB cod and GB yellowtail, both which are considered overfished and subject to overfishing, are prevalent in the area. Increased catch of these stocks could limit the ability for vessels to harvest other under-utilized stocks in the area (i.e. haddock). Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality. Therefore, impacts to non-allocated target species and bycatch would be negligible.

With the exception of large whales, where interactions with trawl gear has not been observed and therefore, is not expected, impacts to protected resources would likely be low negative, as a result of an increase in trawl days. However, it is important to note, that since this exemption's implementation in 2010, takes to protected species have not gone above and beyond those have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014) and thus, beyond a level that threatens or jeopardizes the continued existence of any protected species.

Because sector members would operate under an ACE, an exemption from this restriction would increase their operational flexibility while maintaining the mortality control rationale for the measure. In addition, this exemption could result in increased profit margins if sectors are able to more efficiently harvest underutilized ACEs, such as haddock. Therefore this exemption should result in a low positive impact on human communities.

Under the No Action Alternative for this exemption, sector vessels would not be able to use all trawl gear types when fishing the U.S./Canada Area. Impacts to allocated target species, non-allocated target species and bycatch would be negligible for the reasons described above. Impacts to human communities would be low negative as additional flexibilities would not be realized. Because trawl geardays would not increase, impacts to physical environment/habitat/EFH would be low positive. Impacts to protected resources would likely be negligible or possibly low positive as there may be less geardays and interactions as a result of this exemption.

11. *Requirement to Power a VMS While at the Dock*

Groundfish vessels are required to have an approved and operational VMS on board in order to fish on a Northeast Multispecies DAS, on a sector trip, or when a vessel has declared its intent to fish in more than one broad stock area on the same trip. Once a vessel enters the Northeast groundfishery (i.e., takes its first groundfish trip), the VMS must remain powered-up except under limited circumstances. The requirement facilitates the monitoring of vessels engaged in the Northeast groundfishery.

Sectors have requested an exemption from keeping the VMS units powered while tied to the dock or on a mooring. As this is an administrative matter, exemption to this regulation would have a negligible effect on physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources. The requested exemption would reduce the administrative, logistical, and financial burden of powering the VMS which would represent a low positive impact on human communities.

Under the No Action Alternative for this exemption, sector vessels would be required to have an approved and operational VMS on board in order to fish on a Northeast Multispecies DAS, on a sector trip, or when a vessel has declared their intent to fish in more than one broad stock area on the same trip. Once a vessel entered the fishery, the VMS would need to be powered up except under specific circumstances. As this is an administrative exemption, impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protect resources would be negligible relative to the approval of the exemption. Impacts to human communities would be low negative.

12. *Prohibition on Fishing Inside and Outside the Closed Area I Hook Gear Haddock SAP while on the Same Trip*

Multispecies vessels fishing on a trip within the Closed Area I Hook Gear Haddock SAP are prohibited from deploying fishing gear outside of the SAP on the same trip when they are declared into the SAP (§ 648.85(b)(7)(ii)(G)). This restriction was established to avoid potential quota monitoring and enforcement complications that could arise when a vessel fishes both inside and outside the SAP on the same trip (Framework Adjustment 40-A, 2004). This exemption would allow sectors vessels to fish both inside and outside the Closed Area I Hook Gear Haddock SAP on the same trip. To identify catch from inside and outside the SAP on the same trip, sector vessels would be required to send NMFS a catch report that specifically identifies GB Haddock (and any other shared allocation) catch from inside the SAP within 24 hours of landing or prior to the end of the trip. Sectors wish to increase their operational flexibility and efficiency with this exemption by having the opportunity to fish both inside and outside the SAP on the same trip. NMFS has no reason to believe that this particular catch report would be any less accurate than the existing sector catch reports. As such, NMFS expects negligible impacts on the VECs as a result of this exemption for both alternatives, with the exception of human communities. This exemption is likely to result in a low positive impact on human communities, as it would allow for increased operational flexibility and efficiency. Similarly, relative to approval, the No Action would likely result in low negative impacts to human communities, as sectors would not have this additional flexibility.

13. *Prohibition on a Vessel Hauling Another Vessel's Hook Gear*

Current regulations prohibit one vessel from hauling another vessel's hook gear (§§ 648.14(k)(6)(ii)(B)). The regulations facilitate the enforcement of existing regulations as a single vessel is associated with each set of gear. Sectors have requested an exemption to the rules prohibiting hauling another vessels gear. The exemption would allow fishermen from within the same sector to haul each other's hook gear. However, all vessels participating in "community" fixed gear would be jointly liable for any violations associated with that gear. The regulations were established to facilitate the enforcement of existing regulations and also act as a mortality control measure by reducing geardays. The increased flexibility afforded by this exemption may increase CPUE. An increase in CPUE coupled with ACE would tend to decrease geardays. There is also some potential that gear sharing may lead to a reduction in the number of hooks deployed at one time relative to vessels deploying and retrieving hook gear individually. However, the proposed exemption could result in longer soak times if community gear is attended to less faithfully than individual gear. This could decrease CPUE as longer soaks could result in undocumented groundfish mortality due to losses such as predation and drop-out. Because fish that drop out or are entirely consumed by predators would not be counted against ACE, the decrease in CPUE could result in an increase in geardays and increased fishery mortality. This potential is mitigated because fishermen would still need to comply with federal law and because untended gear can lead to loss of gear, providing an incentive for fishermen to haul gear more frequently.

As such, for the purpose of this assessment it is assumed the exemption is likely to result in a negligible impact on CPUE, soak times, ghost fishing [lost or abandoned gear that continues to fish (FAO 2010)], and geardays. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources are likely to be negligible.

The increased operational flexibility would increase the expected profit margins of sector fishermen, thereby resulting in low positive impacts to sector participants. However, the use of community fixed gear could result in gear being deployed to "hold ground" which could increase inter-vessel conflicts.

As such, overall, implementation of this exemption would represent a negligible impact to human communities.

Under the No Action Alternative for this exemption, sector vessels would have to deploy and haul their own gear. Impacts to all VECs would be negligible for the reasons described above

14. *Requirement to Declare Intent to Fish in the Eastern US/CA Area Haddock SAP and CA II Yellowtail/Haddock SAP Prior to Departure*

Multispecies vessels are required to declare that they will be fishing in either the Eastern US/CA Haddock SAP or the CA II Yellowtail/Haddock SAP prior to leaving the dock (§ 648.85(b)(8)(v)(D) and § 648.85(b)(3)(v)). Framework 40A (2004) implemented this measure so that vessels fishing strictly in those areas could be credited days-at-sea (DAS) for their transit time to and from those SAPs. Sectors are requesting an exemption from having to declare their intent to fish in those areas because they are no longer limited by multispecies DAS and their catch is limited to their ACE. Sectors seek to increase their efficiency with this exemption.

This is an administrative matter. Therefore, an exemption from this regulation would have a negligible effect on physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources. The requested exemption would reduce the administrative burden of declaring intent to fish in either area prior to leaving the dock which would represent a low positive impact on human communities.

Under the No Action Alternative for this exemption, sector vessels would be required to declare their intent to fish in the Eastern US/CA Area Haddock SAP and CA II Yellowtail/Haddock SAP prior to departure from the dock in order to fish on a Northeast Multispecies DAS, on a sector trip, or when a vessel has declared their intent to fish in more than one broad stock area on the same trip. Impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protect resources would be negligible for the reasons described above. Impacts to human communities would be low negative as additional flexibilities would not be realized.

15. *Seasonal Restrictions for the Eastern US/CA Haddock SAP (Year Round Access)*

Multispecies vessels may fish in the Eastern US/CA Haddock SAP from August 1 through December 31 (50 CFR § 648.85(b)(8)(iv). To capture the maximum time requested this exemption proposes to allow sector vessels to fish in the Eastern U.S./Canada Haddock SAP from May 1st through April 30th (i.e., the entire fishing year) so long as the sector has available ACE. The Eastern U.S./CA Area Haddock SAP takes place in and near CAII. Only a small portion of the SAP (45 square nautical miles, representing only four percent of the total SAP area) is actually inside CAII (total area 2,650 square nautical miles). Sectors seek to increase their catch rates with this exemption by shifting effort in time and space. Since sector members would operate under an ACE, a minor increase in CPUE could result in fewer geardays. However, the ability to target specific stocks may also result in an increase in geardays. This assessment conservatively assumes the exemption will result in a minor increase in geardays.

Impacts to the physical environment/habitat/EFH would likely be negligible because any potential increase in geardays would be minor and the SAP is outside of any habitat areas of concern.

In contrast, impacts to allocated target species would be low negative. While the impact of this exemption would in part, be controlled by the ACEs for each allocated target stock, this exemption may increase fishing effort at a time and in areas where allocated target species, specifically haddock, aggregate to spawn.

The seasonal restriction on this SAP was put in place to lower cod and winter flounder catch rates. Catch of both of these species are limited by ACE. However, this exemption may increase disturbance to or harvest of actively spawning groundfish and/or disrupt spawning behavior. This would have a proportionally greater effect on stock production than harvest of non-spawning fish. However, the lower quality and lower price of spawning fish creates disincentive for vessels to target them. Several sectors suggested that access to the SAP be prohibited during March and April to be consistent with the Amendment 13 goal to protect spawning haddock. The most important haddock spawning grounds in the Georges Bank-Gulf of Maine area are on eastern Georges Bank, Georges Bank haddock spawn between January and June, with peak activity usually during late March-April (Bigelow and Schroeder, 1953). Due to the potential to disrupt haddock spawning behavior, this exemption would have low negative impacts on allocated targets species.

Assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACE would limit the potential for impacts to non-allocated target species and bycatch. Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality. Therefore, impacts to non-allocated target species and bycatch would be negligible.

Impacts to protected resources are likely to be low negative as a result of this exemption. Protected resources may present in this area throughout all or some portion of the year (e.g., sea turtles primarily summer through fall). Although it is difficult to predict, the ability to target specific stocks may result in minor increases in geardays, primarily trawl gear (excluding otter trawl), which could result in increased interactions with one or more protected species depending on where and when the use of additional gear occurred. However, should gillnet or trap/pot gear be used, all vessels would have to comply with the requirements of the ALWTRP in this area. In addition, it is important to note, that since this exemption's implementation in 2010, takes to protected species have not gone above and beyond those have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014) and thus, beyond a level that threatens or jeopardizes the continued existence of any protected species.

This exemption should increase a sector's operational flexibility and efficiency. Therefore, this exemption would be expected to have low positive impacts on human communities.

Under the No Action Alternative for this exemption, vessels belonging to sectors would not be able to fish in the SAP from January 1 to July 31. Impacts to physical environment/habitat/EFH and non-allocated target species and bycatch would be negligible for the reasons described above. Impacts to protected resources and allocated target species would likely be low positive due to the potential for fewer interactions. Impacts to human communities would be low negative as sectors would not be given the additional flexibilities associated with allowing the additional fishing within the SAP.

16. Seasonal Restrictions for the CA II YT/Haddock SAP (Year Round Access)

Multispecies vessels can fish in the Closed Area II Yellowtail/Haddock SAP from July 1 through December 31 to target yellowtail flounder, and from August 1 through January 31 to target haddock (§ 648.85(b)(3)(iii)). While sectors were given exemption from trip limits for this SAP in Amendment 16, no adjustment was made to the seasonal restrictions. The exemption is intended to increase catch rates by allowing effort to be shifted in time and space. Since sector members would operate under an ACE, a minor increase in CPUE could result in fewer geardays. However, the ability to target specific stocks may also result in an increase in geardays. This assessment conservatively assumes the exemption will result in a minor increase in geardays.

Impacts to the physical environment/habitat/EFH would likely be negligible because any potential increase in geardays would be minor and the SAP is outside of any habitat areas of concern.

In contrast, impacts to allocated target species would be low negative. While the impact of this exemption would in part, be controlled by the ACEs for each allocated target stock, this exemption may increase fishing effort at a time and in areas where allocated target species, specifically haddock, are aggregating to spawn.

The seasonal restriction on this SAP was put in place to allow vessels to target denser populations of yellowtail flounder and haddock while avoiding cod in the summer and spawning groundfish in the spring. This exemption may increase disturbance to or harvest of actively spawning groundfish and/or disrupt spawning behavior. This would have a proportionally greater effect on stock production than harvest of non-spawning fish. However, the lower quality and lower price of spawning fish creates disincentive for vessels to target them. Several sectors suggested that access to the SAP be prohibited during March and April to be consistent with the Amendment 13 goal to protect spawning haddock. The most important haddock spawning grounds in the Georges Bank-Gulf of Maine area are on eastern Georges Bank, Georges Bank haddock spawn between January and June, with peak activity usually during late March-April (Bigelow and Schroeder, 1953). Due to the potential to disrupt haddock spawning behavior, this exemption would have low negative impacts on allocated targets species.

Assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACE would limit the potential for impacts to non-allocated target species and bycatch. Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality. Therefore, impacts to non-allocated target species and bycatch would be negligible.

Impacts to protected resources are likely to be low negative as a result of this exemption. Protected resources may present in this area throughout all or some portion of the year (e.g., sea turtles primarily summer through fall). Although it is difficult to predict, the ability to target specific stocks may result in minor increases in geardays, primarily trawl gear (excluding otter trawl), which could result in increased interactions with one or more protected species depending on where and when the use of additional gear occurred. However, should gillnet or trap/pot gear be used, all vessels would have to comply with the requirements of the ALWTRP in this area. In addition, it is important to note, that since this exemption's implementation in 2010, takes to protected species have not gone above and beyond those have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014) and thus, beyond a level that threatens or jeopardizes the continued existence of any protected species.

This exemption would increase a sector's operational flexibility and efficiency with by having the opportunity to fish year-round in the SAP. Therefore, this exemption would have low positive impacts on human communities.

Under the No Action Alternative for this exemption, vessels belonging to sectors would not be able to target yellowtail from the SAP between January 1 to May 31 or haddock in the SAP between February 1 and July 31. Impacts to physical environment/habitat/EFH and non-allocated target species and bycatch would be negligible for the reasons described above. Impacts to protected resources and allocated target species would likely be low positive due to the potential for fewer interactions. Impacts to human communities would be low negative as sectors would not be given the additional flexibilities associated with allowing the additional fishing within the SAP.

17. EFP-like Exemption for Sampling

This exemption would allow a federally permitted fishing vessel that is accompanied by an eligible research technician to temporarily retain fish that are not compliant with applicable fishing regulations to collect data (e.g., lengths and weights of discards).

All sampling work would occur during normal fishing operations. Therefore this exemption is not expected to change fishing behavior. The sampled fish will be accounted for as commercial fishing mortality and will be attributed to the appropriate commercial fishing quota. This sampling exemption is not extended to species protected under the Endangered Species Act or Marine Mammal Protection Act. Additionally, all non-compliant fish would be returned to the sea as soon as practicable following data collection. While it is possible that a minor increase in discard mortality may result from the temporary retention of discarded catch, such mortality is minimal in the context of the overall fishery. For these reasons, this exemption would result in negligible impacts to the physical environment/habitat/EFH, allocated target species, non-allocated target species, and protected resources. Likewise, the no action alternative would likely have negligible impacts on the above VECs.

This exemption would have low positive impacts on human communities. Sectors requesting this exemption have developed their own monitoring programs for research purposes. Fish that would normally be discarded are briefly retained to be measured (length, weight, etc.) prior to be returned to the water. The findings from this research could contribute to stock assessment or other fisheries science and can be used to improve the health and productivity of fish stocks. The additional science would not be available to these sectors under the no action alternative, and as such, impacts would be low negative.

18. Access to Western Portion of the Nantucket Lightship Closed Area (NLCA)

Access to NLCA West and East was provided within the FY 2014 Sector rule. These exemptions for FY2015 and beyond are identical. NMFS data from December 2013 (upon implementation of the Closed Area rule [78 FR 76077; December 16, 2015]) shows little effort into these areas. However, the overwhelming majority of the catch is monkfish, dogfish and skates. Table 71 omits species where a minor amount of catch was reported. Sub trips are the portion of a trip that occur witin the statistical areas that most closely align with the NCLA area. The data is from vessels that declared their intent to fish in the VMS within the NCLA closed area from December 2013 through September 30, 2014.

Table 71 - NCLA Catch

AREA	NLCA	OUTSIDE NLCA	TOTAL
Sub-TRIP COUNT	51	20	71
MONKFISH	151,873	4,419	156,292
COD	59	26,255	26,314
DOGFISH SPINY	3,615	994	4,609
FLOUNDER, WINTER		33,915	33,915
FLOUNDER, YELLOWTAIL		8,177	8,177
HADDOCK		106,349	106,349
SKATES	166,245	24,744	190,990
FLOUNDER, WITCH		3,239	3,239
FLOUNDER, AM. PLAICE		21,406	21,406

Impacts to Physical Environment/Habitat/EFH

The western and eastern portions of the NLCA would be open to vessels fishing selective trawl gear, hook gear, or extra-large mesh gillnets (10 inches or greater) for the entire fishing year , as long as gillnets in the western area are equipped with pingers to reduce the capture of porpoises as required by the Harbor Porpoise Take Reduction Plan.

Habitat Vulnerability Analysis

As part of the process of evaluating the effects of different commercial fishing gears on benthic habitats for EFH Omnibus Amendment 2, the NEFMC's Habitat Plan Development Team (PDT) has assessed the susceptibility (S) and recovery (R) potential of five habitat types in high and low energy environments. High and low energy environments were differentiated according to the depth to which tidal currents at the bottom reach a maximum velocity sufficient to transport coarse sand, or a depth of 60 meters – the average depth where annual storm-event wave height conditions occur. PDT members assigned S and R scores to a number of different geological features (e.g., sand waves, cobble pavement, boulders) and structure-forming organisms that are associated with each substrate type based on a review of the available literature. A spatially-explicit model, the Swept Area Seabed Impact (SASI) model, was designed to assess the loss in functional value of structured bottom habitats resulting from the application of a simulated, or an actual, amount of bottom contact by mobile, bottom-tending gear (trawls or dredges) or fixed gear (longlines, traps, and gillnets) and the amount of time required for lost structure to recover in different energy regimes, given information on the life histories (age, growth, longevity) of each type of organism.

The following two tables show the average susceptibility (S) and recovery (R) scores for a single encounter (one tow for bottom trawls and one haul for longlines and gillnets), summarized by feature class (geological or biological), substrate, and energy. Longlines and gillnets are grouped together due to equality of S/R scores. The results for scallop dredge are not shown because they were determined to have the same per unit area impact as bottom trawls. In all cases, the S and R scores are converted to percentages and years, respectively, as shown below. Then the percentages and years for individual features are averaged, with all features weighted equally. Because the SASI model selects percentages and years randomly from the range of possible values according to the S or R score, the averages in Table 72 and Table 73 were calculated based on values selected at random from the ranges of percentages and years, as follows:

S score = 0, loss of functional value = 0 to 10%
S score = 1, loss of functional value = 10 to 25%
S score = 2, loss of functional value = 25 to 50%
S score = 3, loss of functional value = 50 to 100%

R score = 0, years to full recovery = 1
R score = 1, years to full recovery = 1 to 2
R score = 2, years to full recovery = 2 to 5
R score = 3, years to full recovery = 5 to 10

These results indicate the following:

1. For trawls, there is a greater variation in average susceptibility and recovery times across habitat types for geological features than there is for biological features.
2. On average, susceptibility and recovery scores are moderate for all biological features across all habitat types.

3. On average, susceptibility of geological features to trawling is highest in mud and low energy cobble habitats, relatively high in sand and high energy cobble, and lowest in granule-pebble and boulder habitats.
4. For trawls, average recovery times for geological features are rapid (less than a year) in mud, sand, and high energy granule-pebble habitats, moderate in cobble and boulder habitats, and slow in low energy granule-pebble habitats.
5. For bottom longlines and gillnets, average susceptibility scores for all geological and biological features are low (0-10%) across all habitats, but are generally higher for biological features.
6. For bottom longlines and gillnets, average recovery times for affected geological features are very fast (less than a year) in mud, sand, and granule-pebble habitats and higher (1-2 years) in cobbles and boulders.
7. Average recovery times for biological features affected by these two fixed gears vary from less than a year in mud and sand to 1-2 years in the other three habitat types.

These general results of the vulnerability assessment support the decision to focus the habitat impact analysis for the proposed action on the potential effects of bottom trawls, not longlines or gillnets. Fixed gears would be expected to have a negligible impact on bottom habitats in the proposed exemption areas. Further support for the conclusion that bottom trawls (and dredges) have a much greater overall and per unit area impact on bottom habitats than fixed gear is provided in several recently-published fishing effect reports (see Section 4.2.4).

Averaged across all features, trawling can be expected to impact geological features on Georges Bank to a greater degree than it would impact the structure-forming organisms that are associated with them. In the high energy sand, gravel (granule-pebble and cobble), and boulder habitats that characterize the CA I, CA II, and eastern NLCA exemption areas (see 4.7.4.1), trawling could be expected to reduce the functional habitat value provided by geological structure by 10-25% per tow. According to the PDT's assessment, high energy granule-pebble and boulder habitats would be less susceptible to disturbance than high energy sand and cobble habitats. However, high energy sand and granule-pebble habitats would recover in less than a year and cobble and boulder habitats in 1-2 years. For some individual geological features like sand waves, recovery times are very rapid – a matter of hours for small sand waves that are created by tidal currents and months for larger sand waves that are affected by periodic storm-generated waves. These conclusions are very general and not as informative as the spatially-explicit habitat vulnerability model predictions described below.

For more details concerning the feature-based vulnerability assessment and its application in the SASI model, see NEFMC 2011.

Table 72. Summary of susceptibility and recovery scores for trawl gear.

Trawl					
		Average S Score		Average R Score	
Substrate	Energy	Geological	Biological	Geological	Biological
Mud	High	2.0	1.3	0.0	1.5
	Low	2.0	1.4	0.0	1.6
Sand	High	1.8	1.5	0.2	1.6
	Low	1.8	1.6	0.5	1.7
Granule-pebble	High	1.0	1.7	0.3	1.7
	Low	1.0	1.7	2.0	1.7
Cobble	High	1.7	1.6	1.0	1.6
	Low	2.0	1.7	1.5	1.7
Boulder	High	1.0	1.7	1.5	1.6

	Low	1.0	1.8	1.5	1.7

Table 73. Summary of susceptibility and recovery scores for longline and gillnet gears.

Longline, Gillnet					
		Average S Score		Average R Score	
Substrate	Energy	Geological	Biological	Geological	Biological
Mud	High	0.3	0.8	0.0	0.8
	Low	0.3	0.8	0.0	0.6
Sand	High	0.4	0.6	0.0	0.9
	Low	0.5	0.7	0.0	0.8
Granule-pebble	High	0.0	0.8	0.0	1.2
	Low	0.0	0.8	0.0	1.2
Cobble	High	0.3	0.8	1.0	1.1
	Low	0.5	0.8	1.5	1.1
Boulder	High	0.0	0.9	1.5	1.2
	Low	0.0	0.9	1.5	1.2

Current Fishing Activities in the Proposed Exemption Areas

The proposed Western and Eastern NLCA areas were opened in FY 2013 and 2014 for sector vessels using selective gear. Portions of Eastern NLCA have been opened periodically during the last 12 years to scallop dredging (Table 74). The original Nantucket Lightship access area was smaller than the area that went into effect in 2011 (see Figure 65). Based on the information in Table 74, and the northeastern portion of the eastern Nantucket Lightship access areas for 28 months between 2000 and January 31, 2013. There was no scallop dredging in the remainder of the area until the summer of 2011 when the entire area was opened for 7.5 months. It will be open for an additional 7.5 months starting in mid-June 2013.

Table 74. Scallop access into CA I and Eastern NLS exemption areas since 2000

Area	Allowable Effort[1]	Season
Eastern NLS	1 trip @ 10,000 lb	8/15/00-9/30/00
	1 trip @ 18,000 lb	11/2/04-1/31/05
	2 trips @ 18,000 lb	6/15/06-7/20/06[3]
	1 trip @ 18,000 lb	6/15/07-1/31/08
	1 trip @ 18,000 lb	6/28/10-1/31/11
	0.5 trips[2] @ 18,000 lb	6/15/12-1/31/13
	1 trip @ 18,000 lb	6/15/13-1/31/14

[1] allowable effort by full-time scallop vessels
[2] a half trip indicates that half of the fleet are allocated a trip
[3] access area closed early due to yellowtail flounder bycatch

The proposed western Nantucket Lightship exemption area is in a less dynamic environment that is not open to scallop dredging and there is very little clam dredging there. Analysis of logbook data from clam dredge vessels indicates that less than ten trips were made in the area between 2010 and 2012. It is difficult to quantify the extent of new trawl effort into this area, however, the proposed opening would allow for the use of selective trawl gear with no restriction on effort. The trawl use in this area would likely target skates; however, other species may also be targeted with this gear. The amount of bottom disturbance resulting from the use of bottom gillnets or longlines in this area – or in any of the other proposed exemption areas – would be minimal since they contact a very small portion of the bottom and have a minimal impact on benthic habitat features (see above).

No clam trips were reported from the eastern portion of the NLCA between 2010 and 2012. However, the eastern portion of the NLCA is an active scallop access area, and has been disturbed accordingly by scallop dredging.

Habitat Vulnerability To Fishing By Area

The habitats of the proposed exemption areas are described in the Affected Environment section of this document. This description focused on benthic habitats – since pelagic habitats are not susceptible to disturbance by fishing gear – and summarized available information for: a) depth, b) dominant substrates, and c) sediment mobility or bottom shear stress caused by tidal currents. In general, this information shows the eastern NLCA is located in a wide depth range (20-90 meters), are dominated by sand, granule-pebble, and cobble substrates with some boulders, but no mud. Sediments in the western NLCA are composed of sand and mud and are suspended by wave and current action 20-40% of the time in shallower water during the winter and 5-15% of the time in deeper water, but much less often during the summer. Stresses caused by physical factors are not as strong in this area as in the three areas on Nantucket Shoals and Georges Bank.

Simulated model runs were done in order to estimate habitat vulnerability to fishing by gear type in a spatially-explicit (GIS) format. SASI model outputs were generated by applying a hypothetical, uniformly distributed, amount of fishing effort (e.g., area swept by a trawl) equally to individual 100 km^2 grid cells for each gear type. The model results and maps were intended to show how the SASI model combines the susceptibility and recovery parameters for a particular gear type with the underlying substrate and energy distributions. This is intended to indicate the underlying vulnerability of a given location to a given gear type. Because the amount of area swept is the same across gears, the locations that are more or less vulnerable to adverse effects from fishing can be compared.

The model was run continuously, with area swept added in annual time steps, and the simulated outputs for the terminal year were mapped, once the model reached its asymptotic equilibrium (i.e., once Z is stable). Because the maximum recovery time that may be assigned to a habitat feature is 10 years, this equilibrium is reached in year 11. This asymptotically stable equilibrium is referred to as Z_{inf} and the values are negative, with higher negative numbers corresponding to higher vulnerability. According to the assumptions made about which habitat features occur in which substrate/energy-dominated environments, fishing gears can then be expected to encounter different features at different rates. Within each grid cell, some features will be encountered more frequently because the substrate/energy-defined environment in which they occur is more common, and/or the feature occurs in multiple substrate/energy environments with the area defined by the cell. Features that are more frequently encountered will have a greater influence on the resulting habitat vulnerability (Z_{inf}) values predicted by the model.

The results of the simulated model runs for bottom trawls in each of the proposed exemption areas and their surrounding areas are shown in Figure 66. Habitat vulnerability scores (in blue) are lower in most of the proposed CA II area (north of 41° 30 minutes and south of the habitat closed area) than in deeper water on the southern flank of the bank lower than the values along the northern edge of the bank where harder substrates are more common. The same is generally true of the CA I exemption area, although there is one grid cell with a moderate vulnerability score. The scores in the Great South Channel are much higher over a larger area. Both of the proposed Nantucket Lightship exemption areas are also composed of low vulnerability habitats.

Closed Area Research Studies on Georges Bank

Three experimental studies that have been conducted in high-energy benthic habitats on Georges Bank are directly relevant to this analysis. The first one (Stokesbury and Harris 2006) was a before and after impact analysis of scallop dredging effects in CAI and the eastern NLS closed area. The second one (Link et al. 2005) compared the abundance and biomass of fish and benthic invertebrates inside and outside the southern portion of CAI and CA II, and the third (Lindholm et al. 2004) compared the abundance of microhabitats inside and outside the southern portion of CA II. All three studies were done 5-7 years after the groundfish closed areas were established on Georges Bank. Treatment areas for the scallop dredge impact study were located in the proposed CA I and eastern NLS exemption areas, whereas the CA II studies were conducted outside the proposed exemption area on eastern Georges Bank in deeper, more stable sandy habitats. Results from this study can be applied, however, to the middle portion of the CA II north of 41° 30′N latitude where there are similar habitats. The other area studied by Link et al. (2005) included stations inside and outside the proposed CAI exemption area as well as the northern and southern CAI habitat closed areas. Since the habitats in these three areas are different, the results of this portion of the study cannot be applied specifically to the habitat impact analysis for the proposed exemption area.

Stokesbury and Harris (2006) conducted a series of systematic, high-density video surveys of benthic habitat features before and after the CA I and NLS scallop access areas were opened to scallop dredging in 2000. Results were based on visual analyses of video images of surficial sediment types and fish and invertebrates on the bottom. Control areas where no dredging occurred were surveyed at the same time as the impact area surveys in similar benthic environments in the habitat closed areas in the northern part of CA II and the southern part of CA I. Changes in the number of taxonomic categories and the density of individuals within each category in the impact areas were similar to changes in the control areas. Furthermore, there was a significant change in sediment composition (more sand) in the NLS access area during and after opening compared to before. There was also a significant shift in sediment composition in the CA I control area before and after the access area was opened to fishing, with more granule-pebble, less cobble, and less sand and shell debris. The authors concluded that two months of scallop dredging in CA I and four and a half months in CA II appeared to alter the epibenthic community less than the natural dynamic environmental conditions.

The study by Lindholm et al. (2004) was conducted with SEABOSS, a towed video and still photographic system, at a series of paired stations located inside and outside the southern portion of CA II in 1999. Data on the percent relative abundance of seven common and two rare microhabitats were derived from images. Benthic habitats inside and outside the closed area were dominated by sand with emergent epifauna. The other two common microhabitats were featureless sand and shell fragments. Biogenic depressions and sponge habitats were rare. Only two of these habitat types (shell fragments and sponges) were significantly more abundant inside the closed area. The authors attributed the lack of measurable effects to dynamic nature of the physical environment and the life histories of structure-forming organisms that are adapted to such conditions. It is likely that this conclusion would apply even more so to the shallower, more dynamic benthic habitats in the proposed exemption area.

In the Link et al. (2005) study no significant differences were found between the abundance or biomass of nine out of ten major benthic invertebrate species inside and outside CAII. One species of polychaete was more ten times more abundant inside the closed area. The authors concluded that the high-energy sand habitats in this area had a low vulnerability to trawling and dredging, a conclusion that also applies to the shallower and more highly-disturbed sandy bottom habitats in the proposed CAII exemption area, but not to the stable gravel and cobble habitats in that area.

Other field studies of habitat characteristics and their recovery from fishing have been conducted in gravel pavement habitats on the northern edge of Georges Bank (Collie et al. 1997, 2000, 2005, and Asch and Collie 2008) on a regular basis since scallop dredges and bottom trawls were prohibited from the northern portion of CA II in December 1994. Although this research was not done in a proposed exemption area, the results are relevant to this analysis because the habitat type is more similar to the stable gravel habitats on Georges Bank and Nantucket Shoals than the sandy habitats where the two studies mentioned above were done. Benthic communities were sampled at two fixed stations, one (site 17) inside the habitat closed area) and one (site 18) located southwest of it in an area open to fishing, using a small sampling dredge and video and still photography. Depth and bottom types were very similar at the two locations. Researchers returned to the same sites six times between July 1995, six months after bottom trawling and scallop dredging ceased at site 17, and November 2000, six years afterwards. Over that six year period, the total biomass and abundance of benthic organisms increased rapidly, on average two-fold per year for biomass and 1.5 times for abundance (Collie et al. 2005). Compared to the control area (site 18) these changes were statistically significant. Megafauna that increased in abundance were three species of crabs, three echinoderms (a brittle star, a starfish, and a sea urchin), three bivalves (including scallops), a snail (the northern whelk, northern shrimp, and a polychaete. Gravel at site 17 that was barren of attached epifauna in 1994 (this area was heavily dredged for scallops prior to its closure) was covered by a biogenic layer by 1996, was colonized by sponges and hydrozoans with more scallops and crabs a year later, and by 1999 there was an increase in sponge cover with occasional small colonies of a tube-dwelling polychaete. Based on this study, the authors concluded that it takes about ten years for gravel habitats of this type to fully recover from the effects of the use of bottom trawls and dredges. In a follow-up analysis, Asch and Collie (1998) re-analyzed the same set of photographic images from these two sites plus a third shallow water northern edge site in Canada after removing transects where >50% of the photos taken contained >50% sand cover. Their more detailed results supported the findings of the earlier analysis.

Any concerns about the habitat impacts of the proposed action on the more vulnerable gravel habitats in the eastern NLS area (see Figure 61 and Figure 63) that are raised by the northern edge research are unwarranted because both areas have been periodically subjected to heavy scallop dredging since 1994 (see *Current Fishing Activities in the Proposed Exemption Areas* above). Both areas were open to limited access scallop vessels during the last eight months of the 2012 fishing year and the NLS access area opened again for seven and a half months starting in June of 2013. We conclude that any additional bottom contact resulting from trawling on gravel habitats in these two areas would have a minimal adverse impact on those habitats, but since scallop dredges operate in the same habitat type and because there is a lot of unstable sandy habitat in both areas, the overall impacts of the proposed action are expected to be negligible. Although the sediment type and stability data that are available for the proposed western NLS area are not as useful as the data from the other areas, the absence of any gravel sediment samples indicates that it does not have any hard bottom habitats that would be more vulnerable to trawling, based on the research described above. The SASI model results for this area (Figure 66) confirm this conclusion.

Summary of Impact Analysis for Proposed Exemption Areas

The following is a summary of the facts that support the habitat impact conclusions for this action.

1. Benthic habitats in three of the proposed exemption areas in the Great South Channel are regularly disturbed by strong bottom currents and periodically by storm waves which have produced large areas of unstable, sand wave substrate with low densities of structure-forming epifauna.

2. Portions of these areas are dominated by stable gravel, cobble, and boulder-dominated substrates.

3. The proposed western NLS exemption area is composed of soft mud and sand sediments and is subject to less natural disturbance than areas to the east on Nantucket Shoals and the northern edge of Georges Bank.

4. Geological habitat features are more susceptible to disturbance by bottom trawls and dredges in sandy bottom habitats than in gravel and boulder habitats, but recovery times are faster in sand and high energy gravel habitats than in cobble and boulder habitats.

5. As estimated by the SASI model, benthic habitats are less vulnerable to bottom trawls and dredges in all four of the proposed exemption areas than in the Great South Channel.

6. Benthic habitats in the eastern NLCA have been exposed to periodic scallop dredging during the last 13 years, and were open to limited access scallop fishing during the 2012 fishing year; the NLS access area opened again in June 2013.

Based on an evaluation of the physical environmental factors affecting benthic habitat stability and the history of commercial fishing activity in the proposed exemption areas (see conclusions 1-4), we conclude that the physical disturbance caused by natural factors and by on-going scallop dredging activity in the two scallop access areas would exceed the disturbance caused by opening these areas to bottom trawling activity by sector vessels , as proposed by this action. There has been no significant amount of bottom trawling or dredging in the western NLS area since 1994, but the absence of gravel and cobble habitat indicates that any adverse impacts from the proposed action in that area would be minimal.

Based on all of these factors, the overall impact of the proposed exemptions from year-round closures Western and Eastern NLS would result in negligible to low negative impacts on physical environment/habitat/EFH.

Figure 65. Proposed NLS and CA I exemption areas showing scallop access areas (diagonal hatching) and habitat closed areas (shaded). Note that a portion of the eastern NLCA (cross hatched) has been closed longer, see text.

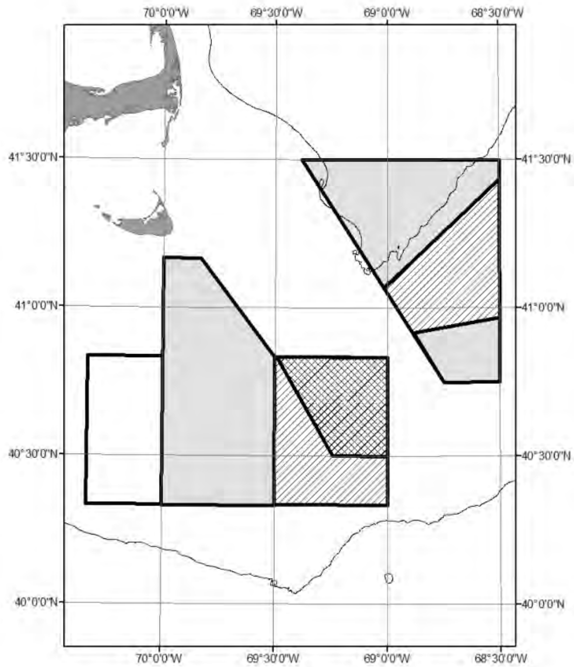
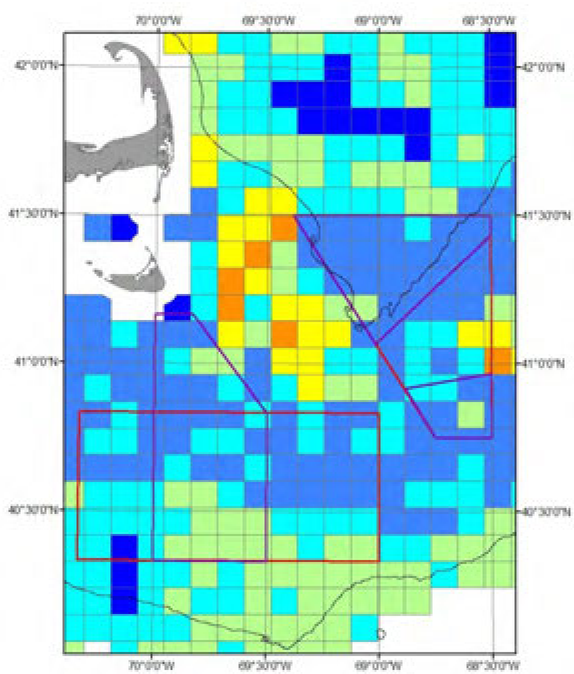


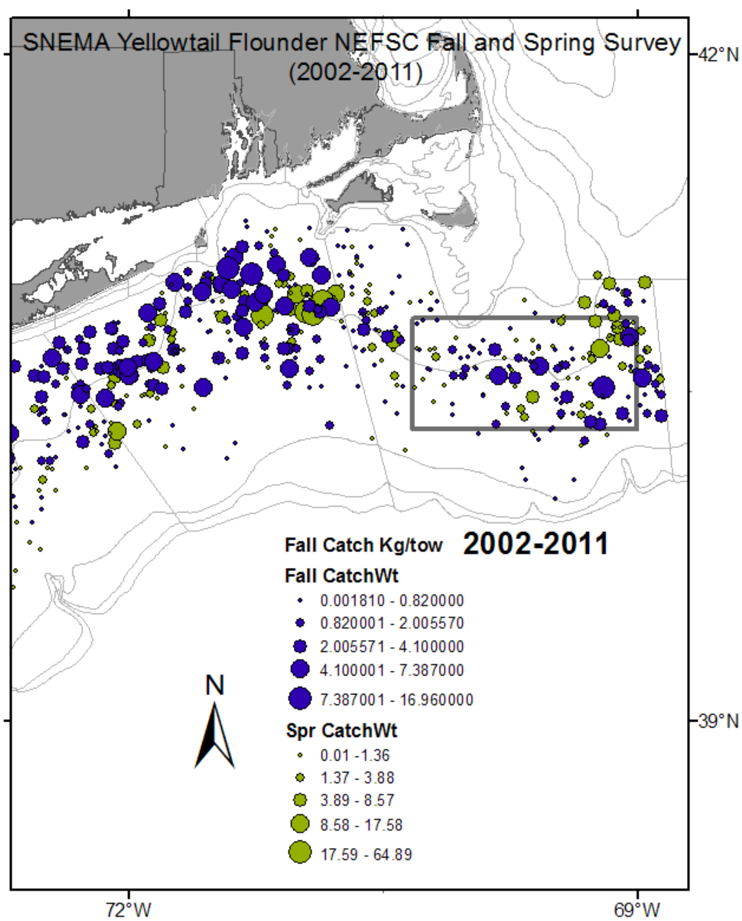
Figure 66. NLS and CA I SASI model simulations showing areas of higher (red) and lower (blue) habitat vulnerability to bottom trawls.



Impacts to Allocated Target Species

The Nantucket Lightship Closed Area lies entirely within the southern New England/Mid-Atlantic yellowtail flounder stock area. Biomass of this stock is much lower in recent years than it was during the 1970s and 1980s (NEFSC 2012a). Considerable uncertainty surrounds the status of this stock, depending on the hypothesized reason for the current low biomass and recruitment. If recruitment has been low due to poor environmental conditions, then the stock is not overfished. However, if recruitment is low because of low spawning biomass, then the stock is overfished. In either case, overfishing is not occurring. The SARC-54 panel considered that the first scenario was somewhat more likely: they evaluated the likelihood of these two scenarios as 60:40. The yellowtail flounder found within the Nantucket Lightship Closed Area are considered a "source population" for the stock. This source population is not a separately managed unit, but is considered to be important to the spawning of this stock. Densities of this stock are moderately high in the eastern portion of the Nantucket Lightship Closed Area, but are lower in the western portion (Figure 67). A fishery in the western portion of area would be expected to have low levels of yellowtail flounder bycatch, both because of the high densities of monkfish and skates, and because of the low density of yellowtail flounder. Additionally, the requirement to use extra-large mesh gillnets and selective trawl gear in the eastern portion of the area would greatly limit the catch of yellowtail flounder, because the eastern portion of the area has the greater density of this yellowtail flounder source population. Therefore, the impact of a fishery in this area on SNE/MA yellowtail flounder is likely low negative.

Figure 67. SNE/MA Yellowtail Flounder Distribution- NEFSC Fall and Spring Survey (2002-20011)



The Nantucket Lightship Closed Area (NLCA) lies entirely within the Southern New England/Mid-Atlantic winter flounder stock area. Fishing mortality on this stock was only 18 percent of FMSY in 2010, but SSB was less than 25 percent of its target (NEFSC 2011). Thus, the stock is overfished, but overfishing is not occurring. Moderate levels of winter flounder occur throughout this area; highest densities are in the northwestern quarter of Nantucket Lightship Closed Area in autumn, and in the northeastern quarter during the spring. The impact of this exemption depends on how much winter flounder is targeted. Because winter flounder catch is restricted to an overall TAC and only a small portion of the stock is within this area the impact of the proposed action on this stock is expected to be low negative.

The NLCA lies within the southern New England/Mid-Atlantic windowpane flounder stock area. This stock is neither overfished, nor is overfishing occurring (NEFSC 2012). The highest densities of this stock in the NLCA occur in the north-central region in the autumn, an area not part of this proposed action. Highest densities in the spring are in the central and southeast portions of the NLCA. Windowpane flounder are generally not targeted, but can occur as bycatch when trawling for other flounders, monkfish or skates. Access in the western portion of this area will likely have a low negative to negligible impact on this stock due to the low density of windowpane flounder in this area, and the fact that it is not targeted.

The other stocks managed as part of the New England multispecies plan either have stock areas that do not lie in the NLCA, or have very low biomass in this area. Thus, the effects of this exemption on these stocks are negligible or low negative.

To sum, NMFS expects low negative impacts to allocated target species as a result of opening up the western portion of the NLCA. The catch of some groundfish stocks may increase when sector vessels are targeting monkfish and skates in this area. However, since these vessels would be on a sector trip, all groundfish catch would be counted against the ACL which ultimately limits overall mortality.

Impacts to Non-allocated Target Species and Bycatch

Monkfish is one of the potential target stocks for an exempted fishery in the NLCA. This area lies entirely within the southern monkfish stock area. This stock is not overfished, and overfishing is not occurring, but there is considerable uncertainty in the assessment of this stock (NEFSC 2010). Monkfish are at low densities in this area during the winter and spring, when they tend to be in deeper water, but are more common in this area during the warmer seasons. Data from the autumn trawl survey indicate that monkfish occur in above average densities in the western portion of the NLCA. Impact of this exemption is likely low negative to negative, depending on how much effort occurs in the area, and how much of this effort targets monkfish. The impact is limited by the overall TACs for the southern monkfish stock, as well as the fact that only a small portion of the stock lies within the proposed exemption area. Although the exemption has the potential to increase monkfish fishing, NMFS will be monitoring catch and has the authority to revoke this exemption should there be a concern that monkfish catch limits would be exceeded.

Skates are a second potential target species in this area. Data from the spring trawl survey shows high densities of winter skate in the northwestern and north-central portions of this area, but low densities in the eastern and southern portions. Little skates concentrate at high densities in the western portion of the area during this time. Winter skates are observed in somewhat lower densities in this northern half of this area in the autumn trawl survey, and at low densities in the southern half, whereas little skates are distributed throughout this area in the autumn at moderate abundance, except the southwest corner, where its density is lower. Because of the high biomass of these species, that only limited portions of their biomasses are in these areas, and that catches are restricted to be below their TACs, impact on these stocks of the proposed action is likely low to moderate. Moderate levels of barndoor skate occur in this area. Because landing of barndoor skate is prohibited, because they may survive discarding, and because only a small portion of this stock is within this area, impact on barndoor skate from the proposed action is likely low. The other four species in the skate complex are very rare, or do not occur, in this area, so that the exemption will have negligible effects on them.

Spiny dogfish are in low abundance in this area during the spring, when they tend to be in deeper waters. Densities in this area during the fall are typically also low, but occasional very high densities of spiny dogfish have been observed in the northern portion of this exemption are during the autumn trawl survey. Because only a very small portion of their biomass is within the exemption area, the impact of the proposed action on spiny dogfish is expected to be low negative to negligible.

American lobster is harvested in small amounts within the proposed NLCA exemption areas. Amounts vary by month, but are minor compared to total lobster landings. Lobster density in this area is much lower than in the Gulf of Maine. Given the small number of lobster harvested from the area and their low densities, it appears that impacts to American lobster stock would be negligible from the approval of this exemption.

The remaining non-target stocks managed under the multispecies FMP will not be impacted substantially by this action, since they are managed though mortality controls under the FMP.

In summary, as described in the above paragraph, NMFS believes it is reasonable to expect low negative to negligible impacts to non-allocated species as a result of approving this exemption. Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality.

Impacts to Protected Resources

Marine Mammals

Small Cetaceans and Pinnipeds

As provided in section 4.5.4.1.2, in the affected environment of the multispecies fishery, gillnet and bottom trawl fisheries (LOF Category I and II fisheries) pose the greatest risk of serious injury and mortality to small cetaceans and pinnipeds. As a result, the greatest concern with granting access to the western portion of the NLCA (west of the habitat closure area) is the risk of increased interactions with fishing gear, particularly gillnet gear, in this area. From 2007-2012, there has been a "wall" of observed marine mammal (i.e., harbor porpoise, harbor seals, and harp seals) takes in gillnet gear, along the boundary of the closure (see Figure 11 and Figure 12). Monkfish gillnet gear is the primary gear interacting with porpoises (and seals) in this area. This type of gear has characteristics that have traditionally been associated with high marine mammal bycatch rates (e.g., 12 inch mesh, long soak durations, long gear lengths). As this portion of the Nantucket Light Ship Closed Area is within the HPTRP Southern New England Managmenet Area, pingers are required on all gillnet gear in this HPTRP Management Area from December 1 through May 31. In examining trawl gear interactions with marine mammals, there appear to be fewer recorded interactions around the NLCA than in CA I and II. A handful of documented trawl gear takes have been recorded just below the southeast corner of the NLCA, mainly consisting of pilot whales, white-sided dolphins and harbor seals. This is likely a product of a lack of trawl fishing effort in this particular area. As the data in Table 71 shows, there was a small amount of effort into the NCLA closed areas in FY 2014. The primary catch are comprised of monkfish, skates, and dogfish. Selective gear is required for trawl use, and NMFS does not anticipate that trawling would increase as the catch data for FY 2014 clearly indicates the target species (monkfish, dogfish and skate) within this area are fished for with gillnet gear.

It is unclear how opening the western portion of the NLCA will result in changes in fishing behavior (e.g., changes and/or shifts in gillnet), especially as most effort around the western portion of the is focused on non-allocated species like dogfish, monkfish and skates . Sector trips targeting those stocks in this area would be linked to NE multispecies DAS and sector ACE, so a sector's effort in this area would be limited by the sector's allocation. It is likely that vessels would only fish in this area if they could harvest at the same or greater catch per unit effort. As a result, it is likely that an increase in catch per unit effort while being constrained by DAS and sector ACE, could result in a decrease in potential interactions with small cetaceans or pinnipeds. Additionally, if effort is displaced from other less efficient areas, where low catch per unit effort could result in more gear days and thus, a greater potential to interact with small cetaceans or pinnipeds, to an area where there is greater catch per unit effort, interactions could potentially decrease. Alternatively, however, opening this portion of the NLCA could possibly result in an increase in effort in this newly opened area. As gillnets are the primary gear type used in this area to target monkfish, dogfish and skate, any potential increase in gillnet effort could result in an increase in interactions with small cetaceans or pinnipeds, specifically, if large mesh (e.g. monkfish, skates) gillnet effort shifts and increases into the newly opened area (e.g., from the area to the west and/or south of NLCA or from effort that currently occurs to the east of Cape Cod), that could create additional interactions and/or shift interactions from the present location near the western/southwestern NLCA border into the newly opened area (e.g., against the western border of the habitat closure at 70º00'W).

Another possible change in fishing behavior that may occur as a result of opening the western NLCA is that effort may only shift, not increase, once this portion of the NLCA is opened. Although the potential for an interaction still exists , there is also the potential for interactions to decrease in this area from what has previously been observed. As is depicted in Figure 70, there has been a high number of gillnet takes of marine mammals (primarily harbor porpoise) observed, along the western boundary of the NLCA, particularly along the southern and southwestern corner of the NLCA. If opening this area results in effort shifting, and thus becoming spread out over a larger area, there could potentially be a decreased level of entanglement risk, as areas in which gillnet gear is currently heavily concentrated become more diffuse.

As it can be seen, it is difficult to quantify the potential effects to small cetaceans and pinnipeds from opening this portion of the NLCA. There are a range of possible effects to the species from opening this area, which all are higly influenced by the manner in which fishing behavior changes in the area once this area is opened. As this exemption has not been in place as long as the others, additional data still needs to compiled and assessed to fully understand the outcomes of opening this area on fishing behavior in the area and its resultant effects to small cetaceans and pinnipeds. It is important to note; however, that this portion of the NLCA falls within HPTRP Southern New England Managmenet Area, and thus, pingers are required on all gillnet gear in this HPTRP Management Area from December 1 through May 31. Based on this and the information provided above, a conservative estimate of the impacts from this exemption would be low negative.

Large Whales

The greatest entanglement risk to large whales is posed by fixed fishing gear (e.g., sink gillnet and trap/pot gear) comprised of lines (vertical or ground) that rise into the water column; interactions with trawl gear have not been documented to date and therefore, are not expected to pose a serious injury or mortality risk to these species (Waring et al. 2014). As a result, the greatest concern with granting access to the western portion of the NLCA (west of the habitat closure area) is whether opening this area will change fishing behaviors such that, the risk of entanglement in fixed fishing gear, and thus the potential for serious injury and mortality, is increased for large whales.

As described in the small cetacean section, all of the uncertainties with regard to how opening the western portion of the NLCA will result in changes in fishing behavior (e.g., changes and/or shifts in gillnet or trap/pot effort) apply to large whales.

In regards to pot/trap gear, there has been some concern raised related to the potential for lobster trap/pot gear effort to shift away from NLCA as a result of allowing trawl gear access to this area. It is unclear where this effort would shift, and if it would shift into areas with seasonally higher abundances of large whales(e.g., waters in around Cape Cod and Massachusetts Bay; see section 4.5.3.2). However, VTR data indicates that very little lobster effort takes place in NLCA. There were no reported VTR landings for Area 3 permitted vessels in the NLCA in 2012, so it is unlikely that any trap/pot effort shift out of the area would result in a more than a minor increase in the risk of interactions.

As it can be seen, it is difficult to quantify the potential effects to large whales from opening this portion of the NLCA. There are a range of possible effects to large whale species from opening this area, which all are higly influenced by the manner in which fishing behavior changes in the area once this area is opened. As this exemption has not been in place as long as the others, additional data still needs to compiled and assessed to fully understand the outcomes of opening this area on fishing behavior in the area and its resultant effects to large whales. It is important to note; however, that this portion of the NLCA falls within ALWTRP gillnet and trap/pot management areas and therefore, all fishmen must compile with the regulations in these areas (see section 4.5.4.1.1). Based on this and the information provided above, a conservative estimate of the impacts on large whales from this exemption would be low negative.

Sea Turtles

Sea turtle interactions with trawl and gillnet gear have been observed in waters from the GOM to the Mid-Atlantic; however, most of the observed interactions in bottom gears have occurred in SNE and Mid-Atlantic waters. As few sea turtle interactions have been observed in the GOM and GB regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl or gillnet gear in these regions and therefore, produce a bycatch estimate for these regions. As a result, loggerhead bycatch estimates to date are based on observed sea turtle interactions in trawl and gillnet gear in the Mid-Atlantic (SNE included).

West of the NLCA, sea turtles have been documented (primarily south of approximately 42°N and west of 71°W) in gillnet and trawl gear; however, no interactions have been observed near or around the boundary of the NLCA. Loggerhead bycatch rates west of the NLCA in both bottom trawl and sink gillnet gear are generally higher from May to October than in other months (Warden 2011, Murray 2009). For trawl gear, loggerhead interaction rates were associated with latitude, depth, and sea surface temperature (Warden 2011). Similarly, bycatch rates of loggerheads in sink gillnet gear were correlated with latitude, sea surface temperature, and mesh size (Murray 2009). Higher bycatch rates have historically been associated with large mesh gillnet gear (Murray 2009), and in the last five years sea turtle interactions observed to the west of the NLCA (for the coordinates of the proposed exemption area, see Section 3.3) have all been in large mesh (11 or 12") gillnets targeting monkfish or skate.

The impact to sea turtles of opening NLCA depends on whether effort shifts or increases – see above discussion. For effort shifts, it depends on whether effort shifts from areas with bycatch rates different from the area the effort is shifted to. There is no information to suggest that bycatch rates within the NLCA are higher than areas immediately adjacent to the closure so if effort is simply redistributed from outside the areas to within, we would not expect impacts to sea turtles to increase. Alternatively, substantial shifts in effort from areas or times with higher bycatch rates to areas with lower bycatch rates (e.g., shifts in effort from more southern areas into the NLCA)) might reduce impacts to sea turtles. While effort in the multispecies fishery is unlikely to increase (and may decrease further), it is less clear whether effort in other fisheries (e.g., dogfish, skate) are likely to change as a result of this action. Increased effort in these fisheries, which typically use large mesh gear, could have an impact on sea turtles, particularly in the Southern New England area during months with warm water temperatures. A review of NMFS data from the FY 2014 exemption into the NLCA shows that all trips in the NLCA were taken by gillnet vessels (Table 75-**Table 78**). We do not expect a substantial amount of trawl effort in the area. For reasons similar to those cited above for marine mammals in this area, it is possible that there could be low negative impacts to sea turtles.

Atlantic Sturgeon

The sector exemption for the NLCA mortality closure area is intended to allow fishers to optimize take of non-groundfish species (e.g., monkfish and skates) while on a groundfish trip. The monkfish gillnet has been identified as a primary source of Atlantic sturgeon bycatch mortality (ASMFC, 2007). As most effort around the western portion of the NLCA is focused on non-allocated species like monkfish , any increase in gillnet effort as a result of opening the western portion of NLCA may result in increased interactions with Atlantic sturgeon. As indicated by the FY 2014 data cited at the beginning of this discussion, there is low trawl effort in this area. It is possible that sturgeon bycatch mortality could increase if effort was to shift from areas where Atlantic sturgeon is less likely to occur into areas where Atlantic sturgeon is more likely to be present. It is entirely possible that effort could shift to areas where less sturgeon are found. A review of NMFS data from the FY 2014 exemption into the NLCA shows that all trips in the NLCA were taken by gillnet vessels (Table 75-**Table 78**). We do not expect a substantial amount of trawl effort in the area. Because of the limited timeframe of this action and because there are already effort controls (i.e., annual catch entitlements) in place for sector vessels that are decreasing, and because there is no information to suggest that effort would shift from areas with a lower probability of interaction with Atlantic sturgeon to areas higher, the impacts on Atlantic sturgeon are negligible.

A new report entitled, "An Atlantic Sturgeon Population Index for ESA Management Analysis" was released by the NEFSC on April 22, 2013. The details from this report are discussed in the affected environment. The most recent data as shown in Section 4.5 concerning Atlantic sturgeon abundance together with the information as discussed above makes it likely that impact from this proposed opening on Atlantic sturgeon would be negligible.

Impacts to Human Communities

If approved, this measure would allow sector vessels to access western portions of the Nantucket Lightship Closed area until April 30, 2017. Gillnet vessels would be required to use pingers when fishing in this area as stipulated in the Harbor Porpoise Take Reduction Plan.

Sector Vessels

As described in the Affected Environment section of this document, sector vessels impacted by this exemption fish under a series of catch limitations. The impacts to Human Communities from this exemption are primarily a function of possible changes in profitability deriving from additional fishing opportunities in the access area, opportunities that may either (a) allow vessels to increase catch of stocks which have not, historically, been limited by ACE allocations; (b) increase catch rates and consequent profitability as vessels are able to catch and retain the same amount of ACE-limited stocks but do so with less time, fuel and other costs of operation; or (c) access non-groundfish stocks while fishing for groundfish, increasing overall fishing effort and revenues. Increased revenue and profitability has second and third order effects on fishing communities as crew, captains and owners are able to contribute additional economic activity either through business re-investment or increased consumption.

Observer data from 2009-2012 were queried to assess the likelihood of fishing effort shifting into the newly opened area. Specifically, catch rates of groundfish and important non-groundfish species (lobsters, skates, monkfish and dogfish) were compared between observed tows within statistical areas adjacent to the current closure[25] and observed tows which ended close to the boundaries of the current closure[26]. In this area, during the timeframe of the proposed opening, observed catch rates are

25 Statistical area 537 is included as areas adjacent to this proposed opening.

26 Tows made within 10nm of the boundaries for the proposed areas were compared to all other tows made within adjacent statistical areas. The boundaries used to frame these 10nm proximate areas are: Point 1 (41N, -070.333W); Point 2 (41N, -070.5W); Point 3 (40.167N, -070.333W); Point 4 (40.167N, -070.5W).

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substantially higher in the adjacent statistical areas than they are in the immediately proximate areas. This holds for both fixed (longline and gillnet) and mobile gears (Table 75). Mean values are higher than median values, and mean values are also higher for proximate areas than the corresponding median values. This implies that certain tows may have had substantially higher catch rates in the proximate area than in the broader adjacent statistical areas, but that these tows were not distributed uniformly across the timeframe of the proposed opening. Vessels electing to fish inside this proposed access area are most likely to be attracted by improved catch rates for non-groundfish stocks, as groundfish catch rates are substantially lower than non-groundfish rates for this area. This exemption will almost certainly result in an overall increase in fishing effort, though the magnitude of the increase is uncertain. Improvements in vessel-level profitability would likely be the result of additional fishing opportunities not previously available.

Based on VTR trip location data, well less than one percent of all fixed gear groundfish catch comes from longline and gillnet vessels fishing in the statistical areas adjacent to the NLCA-West access area during the timeframe of the proposed opening. However, almost 20% of all lobster, skate, monkfish and dogfish caught on groundfish trips by sector vessels is taken in statistical area 537. Likewise, less than one percent of all trawl gear groundfish catch comes from this adjacent statistical area, but 17% of all lobster, skate, monkfish and dogfish is taken in this statistical area (Table 76).

With little or no catch data available for widespread commercial fishing inside the proposed access area, there is little data upon which to base estimates of overall effort shift into this area during the opening timeframe. Trips that previously occurred closest to the boundaries may be likely to explore the new fishing opportunities afforded by the opening, but the areas well inside the proposed access area may contain species mixes and provide access to stocks that are fundamentally different from fishing practices observed along the boundaries of the opening. Differences in catch composition and available revenues well inside the opening and external to it mean that confidence in an effort-shift estimations is low, but based on the high catch rates for non-groundfish stocks in this area aggregate effort increases seem likely. While the rates are higher in the non-proximate portions of the adjacent statistical areas, catch rates along the boundary may not be reflective of those available in the interior of the access area.

This exemption will likely result in a moderate change in the overall spatial distribution of fishing effort, primarily through increased targeting of non-groundfish stocks while on groundfish trips. The proximate area catch rate data point towards some incentive for fishing inside this proposed access area, though confidence in this conclusion is relatively low due to uncertainty regarding catch rates in the interior of the opening. Any fishing effort that does shift inside this proposed access area will be drawn in by access to profitable non-groundfish stocks and not by increased catch rates on groundfish. Gillnet vessels choosing to operate in this area would need to rig their gear with pingers if they do not already use them, but the cost of this investment would likely be outweighed by the benefits of access to the area if owners elect to make such an investment. This exemption is most likely to result in benefits to human communities from additional fishing opportunities, though the magnitude of these benefits cannot be estimated.

Non-Sector Vessels

Non-sector vessels may be affected by this proposed action if sector operations displace vessels engaged in non-groundfish fishing. In the NLCA, this may apply to vessels participating in the surf clam/ocean quahog and scallop fisheries. Given the timing of the opening and the small incentives for substantial changes in the spatial distribution of fishing effort, conflicts between Sector vessels and vessels participating in these fisheries are unlikely.

Table 75. Nominal catch and revenue rates for areas adjacent (neighboring stock areas) and proximate (within approximately10 nautical miles of boundary) to the NLCA-West access area.

				Catch per hour towed (lbs)			Revenue per hour towed ($)			
Area	Gear	Proximate	Species	Mean	Median	Stdev	Mean	Median	Stdev	n obs tows
NLCA-W	fixed	No	groundfish	229	22	489	462	48	1,029	69
NLCA-W	fixed	No	lobster, skate, monkfish, dogfish	514	338	611	716	455	778	1,411
NLCA-W	fixed	Yes	lobster, skate, monkfish, dogfish	442	354	630	958	823	918	104
NLCA-W	mobile	No	groundfish	36	4	91	55	7	160	780
NLCA-W	mobile	No	lobster, skate, monkfish, dogfish	128	24	461	180	54	372	1,758
NLCA-W	mobile	Yes	groundfish	6	1	16	8	2	21	36
NLCA-W	mobile	Yes	lobster, skate, monkfish, dogfish	93	54	122	270	149	345	77

Table 76. VTR-reported contribution of landings and revenues from statistical areas adjacent to, and areas immediately proximate to, the NLCA-West access area during the timeframe from the proposed opening.

Area	Gear	Proximate	Catch	% lbs caught	% revenue
NLCA-W	fixed	No	groundfish	0.0%	0.0%
NLCA-W	fixed	No	lobster, skate, monkfish, dogfish	18.9%	30.2%
NLCA-W	fixed	Yes	groundfish	0.0%	0.0%
NLCA-W	fixed	Yes	lobster, skate, monkfish, dogfish	1.0%	1.9%
NLCA-W	mobile	No	groundfish	0.5%	0.5%
NLCA-W	mobile	No	lobster, skate, monkfish, dogfish	17.7%	13.0%
NLCA-W	mobile	Yes	groundfish	0.0%	0.0%
NLCA-W	mobile	Yes	lobster, skate, monkfish, dogfish	0.1%	0.1%

19. Access to the Eastern Portion of the Nantucket Lightship Closed Area

See Table 71 for data related to fishing within the NCLA closed areas from implementation in December 2013 through September 30, 2014. Overall, the species caught in substantial amounts were monkfish, dogfish and skates. This was anticipated and was the main reason for sector requests for access into this area.

Impacts to Physical Environment/Habitat/EFH

Access to the Eastern NLCA would result in negligible to low negative impacts on physical environment/habitat/EFH. Please refer to the habitat discussion under the *Access to Western Portion of the Nantucket Lightship Closed Area (NLCA)* exemption for further details.

Impacts to Allocated Target Species

The Nantucket Lightship Closed Area (NLCA) lies entirely within the southern New England/Mid-Atlantic yellowtail flounder stock area. Densities of this stock are moderately high in the proposed area as compared to outside the area. NEFSC scientists have raised the possibility that yellowtail in this area may have special importance as a source population that supplies larvae to downstream locations in this stock.

This exemption is designed to increase catch of monkfish and skates. Since these species are at relatively low densities, and yellowtail flounder is at a relatively high level in the eastern portion of this area, a fishery in the eastern portion of the NLCA can be expected to increase levels of yellowtail flounder bycatch. Even though SNE/MA YT flounder is managed by ACL and extra-large gillnet mesh and selective trawl gear would be required, it is possible more of the ACL would be caught under this exemption. Therefore it is reasonable to expect a low negative impact from the approval of this exemption.

The NLCA lies entirely within the Southern New England/Mid-Atlantic winter flounder stock area. Fishing mortality on this stock was only 18 percent of FMSY in 2010, but SSB was less than 25 percent of its target (NEFSC 2011). Thus, the stock is overfished, but overfishing is not occurring. Moderate levels of winter flounder occur throughout this area; highest densities are in the northwestern quarter of NLCA in autumn, and in the northeastern quarter during the spring. The impact of the proposed action depends on how much winter flounder is targeted. Because winter flounder catch is restricted to an overall TAC and only a modest portion of the stock lies inside the area, the impact of the proposed action on this stock is expected to be low negative to negative.

The NLCA lies within the southern New England/Mid-Atlantic windowpane flounder stock area. This stock is neither overfished, nor is overfishing occurring (NEFSC 2012). The highest densities of this stock in the NLCA occur in the north-central region in the autumn, an area not part of this proposed action. Highest densities in the spring are in the central and southeast portions of the NLCA. Windowpane flounder are generally not targeted, but can occur as bycatch when trawling for other flounders, monkfish or skates. Impacts are likely to be moderately higher in the eastern portion because densities can be higher there compared to the western portion of NLCA. Because windowpane are not targeted and only a small portion of the stock lies inside this area impacts of the proposed action in the eastern portion are expected to be low negative.

The other stocks managed as part of the New England multispecies plan either have stock areas that do not lie in the NLCA, or have very low biomass in this area. Thus, the effects of the proposed actions on these stocks are negligible or low negative.

To sum, NMFS expects low negative impacts on allocated target species as a result of opening up the western portion of the NLCA. The catch of some groundfish stocks may increase when sector vessels are targeting monkfish and skates in this area. However, since these vessels would be on a sector trip, all groundfish catch would be counted against the ACL which ultimately limits overall mortality.

Impacts to Non-Allocated Target Species and Bycatch

Monkfish is one of the potential target stocks for an exempted fishery in the Nantucket Lightship Closed Area. This area lies entirely within the southern monkfish stock area. This stock is not overfished, and overfishing is not occurring, but there is considerable uncertainty in the assessment of this stock (NEFSC 2010). Monkfish are at low densities in this area during the winter and spring, when they tend to be in deeper water, but are more common in this area during the warmer seasons. Data from the autumn trawl survey indicate that monkfish occur in below average densities in the eastern portion of the NLCA. Impact of the proposed action is likely low negative to negative, depending on how much effort occurs in the area, and how much of this effort targets monkfish. The impact is limited by the overall TACs for the southern monkfish stock, as well as the fact that only a small portion of the stock lies within the proposed exemption area.

Skates are also a potential target species in this area. Data from the spring trawl survey shows high densities of winter skate in the northwestern and north-central portions of the NLCA, but low densities in the eastern and southern portions. Little skates concentrate at high densities in the western portion of the NLCA during this time. Winter skates are observed in somewhat lower densities in this northern half of this area in the autumn trawl survey, and at low densities in the southern half, whereas little skates are distributed throughout this area in the autumn at moderate abundance, except the southwest corner, where its density is lower. Because of the high biomass of these species, that only limited portions of their biomasses are in these areas, and that catches are restricted to be below their TACs, impact on these stocks of the proposed action is likely low to moderate. Moderate levels of barndoor skate occur in this area. Because landing of barndoor skate is prohibited, because they may survive discarding, and because only a small portion of this stock is within this area, impact on barndoor skate from the proposed action is likely low. The other four species in the skate complex are very rare, or do not occur, in this area, so that the proposed action will have negligible effects on them.

Spiny dogfish are in low abundance in this area during the spring, when they tend to be in deeper waters. They have moderate densities in this area during the fall. Because only a very small portion of their biomass is within the exemption area, the impact of the proposed action on spiny dogfish is expected to be low negative to negligible.

American lobster is harvested in small amounts within the proposed NLCA exemption areas. Amounts vary by month, but are minor compared to total lobster landings. Densities of lobsters in this area are also fairly low. Given the small number of lobster harvested from the area and the fact lobsters in this area are only a very small portion of the stock , it appears that impacts to American lobster stock would be negligible from the approval of this exemption.

The remaining non-target stocks managed under the multispecies FMP will not be impacted substantially by this action, since they are managed though mortality controls under the FMP.

In summary, as described in the above paragraph, NMFS believes it is reasonable to expect low negative to negligible impacts to non-allocated species as a result of approving this exemption. Additionally, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality.

Impacts to Protected Resources

The impacts of this exemption are expected to be similar to those in the western NLCA. However, historically, harbor porpoise takes traditionally appear to be low in the vicinity of the eastern portion of NLCA and sightings information here (not effort-corrected) is sparse in all months except for April and May. Further, it is unclear if opening the eastern portion of NLCA (e.g., to the east of the habitat closure area) would increase gillnet effort in this area, as gillnet effort (according to observed takes and vessel trip reports) appears to be quite low around this area. This portion of the NLCA is not included in the HPTRP, and therefore pingers would not be required while fishing in this area; however, this area is still within the ALWTRP management area and therefore, regulations under the ALWTRP must be complied with. For the reasons provided aboveand within exemption 20, the impacts to marine mammals would be low negative.

Impacts to Human Communities

If approved, this measure would allow sector vessels to access Eastern portions of the NLCA area until April 30, 2017. Gillnet vessels would be required to use pingers when fishing in this area.

Sector Vessels

As described in the Affected Environment section of this document (Section 4.0), sector vessels impacted by this exemption fish under a series of catch limitations. The impacts to Human Communities from this exemption are primarily a function of possible changes in profitability deriving from additional fishing opportunities in the access area, opportunities that may either (a) allow vessels to increase catch of stocks which have not, historically, been limited by ACE allocations; (b) increase catch rates and consequent profitability as vessels are able to catch and retain the same amount of ACE-limited stocks but do so with less time, fuel and other costs of operation; or (c) access non-groundfish stocks while fishing for groundfish, increasing overall fishing effort and revenues. Increased revenue and profitability has second and third order effects on fishing communities as crew, captains and owners are able to contribute additional economic activity either through business re-investment or increased consumption.

Observer data from 2009-2012 were queried to assess the likelihood of fishing effort shifting into the newly opened area. Specifically, catch rates of groundfish and important non-groundfish species (lobsters, skates, monkfish and dogfish) were compared between observed tows within statistical areas adjacent to the current closure[27] and observed tows which ended close to the boundaries of the current closure[28]. In this area, during the timeframe of the proposed opening, observed catch rates are substantially higher in the adjacent statistical areas than they are in the immediately proximate areas. This holds for both fixed (longline and gillnet) and mobile gears, though trawl effort is very low (Table 77). Mean values are higher than median values, and mean values are also higher for proximate areas than the corresponding median values. This implies that certain tows may have had substantially higher catch rates in the proximate area than in the broader adjacent statistical areas, but that these tows were not distributed uniformly across the timeframe of the proposed opening. Vessels electing to fish inside this proposed access area are most likely to be attracted by improved catch rates for non-groundfish stocks, as groundfish catch rates are substantially lower than non-groundfish rates for this area. This exemption may result in an overall increase in fishing effort, though the magnitude of the increase is likely to be small. Improvements in vessel-level profitability would likely result from additional fishing opportunities not previously available.

Based on VTR trip location data, well less than one percent of all fixed gear groundfish catch comes from longline and gillnet vessels fishing in the statistical areas adjacent to the NLCA-West access area during the timeframe of the proposed opening. Less than one percent of groundfish and non-groundfish species are taken on groundfish trips in statistical area 526. Overall groundfish fishing effort in this area is very low (**Table 78**).

With little or no catch data available for widespread commercial fishing inside the proposed access area, there is little data upon which to base estimates of overall effort shift into this area during the opening timeframe. Overall groundfish fishing effort indicates that participation in this access area may be low.

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27 Statistical area 526 is included as areas adjacent to this proposed opening.

28 Tows made within 10nm of the boundaries for the proposed areas were compared to all other tows made within adjacent statistical areas. The boundaries used to frame these 10nm proximate areas are: Point 1 (41N, -069.5W); Point 2 (41N, -069.333W); Point 3 (40.167N, -069.5W); Point 4 (40.167N, -069.333).

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Catch rates are relatively higher for non-groundfish stocks, however, and this may induce some additional fishing effort relative to the No Action Alternative.

This exemption will likely result in very little change in the overall spatial distribution of fishing effort, though some vessels may elect to fish in the access area if increased targeting of non-groundfish stocks while on groundfish trips is possible. The proximate area catch rate data point towards little incentive for fishing inside this proposed access area, though confidence in this conclusion is relatively low due to uncertainty regarding catch rates in the interior of the opening. Any fishing effort that does shift inside this proposed access area will be drawn in by access to profitable non-groundfish stocks and not by increased catch rates on groundfish. This exemption is most likely to result in small benefits to human communities from additional fishing opportunities, though the magnitude of these benefits cannot be estimated.

Non-Sector Vessels

Non-sector vessels may be affected by this proposed action if sector operations displace vessels engaged in non-groundfish fishing. In the NLCA, this may apply to vessels participating in the surf clam/ocean quahog and scallop fisheries. Given the timing of the opening and the small incentives for substantial changes in the spatial distribution of fishing effort, conflicts between Sector vessels and vessels participating in these fisheries are unlikely.

Table 77. Nominal catch and revenue rates for areas adjacent (neighboring stock areas) and proximate (within approximately 10 nautical miles of boundary) to the NLCA-East access area.

				Catch per hour towed (lbs)			Revenue per hour towed ($)			
Area	Gear	Proximate	Species	Mean	Median	Stdev	Mean	Median	Stdev	n obs tows
NLCA-E	fixed	No	lobster, skate, monkfish, dogfish	472	322	565	732	424	737	92
NLCA-E	mobile	No	Groundfish	17	8	23	32	16	40	70
NLCA-E	mobile	No	lobster, skate, monkfish, dogfish	426	38	909	362	55	771	211
NLCA-E	mobile	Yes	Groundfish	14	3	21	34	8	58	12
NLCA-E	mobile	Yes	lobster, skate, monkfish, dogfish	916	56	2,022	917	84	1,921	40

Table 78. VTR-reported contribution of landings and revenues from statistical areas adjacent to, and areas immediately proximate to, the NLCA-East access area during the timeframe from the proposed opening.

Area	Gear	Proximate	Catch	% lbs caught	% revenue
NLCA-E	fixed	No	groundfish	0.0%	0.0%
NLCA-E	fixed	No	lobster, skate, monkfish, dogfish	2.0%	2.5%
NLCA-E	mobile	No	groundfish	0.3%	0.3%
NLCA-E	mobile	No	lobster, skate, monkfish, dogfish	0.6%	0.6%
NLCA-E	mobile	Yes	groundfish	0.0%	0.0%
NLCA-E	mobile	Yes	lobster, skate, monkfish, dogfish	0.0%	0.0%

20. 5.5-inch Mesh Size or Greater for Directed Redfish Trips (Novel exemption for 2015/16)

Minimum mesh size restrictions (§ 648.80(a)(3)(i), (a)(4)(i), (b)(2)(i), (c)(2)(i)) were implemented under Amendment 13 (69 FR 22906, 4/27/04) in conjunction with other management measures, including Framework 42 (FW 42) (71 FR 62156, 10/23/06), to reduce overall mortality on groundfish stocks, change the selection pattern of the fishery to target larger fish, improve survival of sublegal fish, and allow sublegal fish more opportunity to spawn before entering the fishery. Beginning in FY 2012, sectors were allowed to use a 6-inch codend to target redfish in the Gulf of Maine. Subsequently, at the end of FY 2012 and into FY 2013, sectors were allowed to use a 4.5-inch codend to target redfish provided that 80-percent or greater of their groundfish landings were redfish and no more than 5 percent of total catch was groundfish discards (including redfish). For FY 2014, NMFS allowed sector vessels to use a 6-inch mesh, or larger, codend to target redfish with the 80-percent threshold of groundfish landings and 5 percent threshold of groundfish discards.

This year's exemption is similar to prior redfish exemption requests and would allow for the use of 5.5 inch mesh cod end to target redfish. The vessels participating in the redfish fishery would be subject to the same NEFOP and at-sea monitor coverage as standard groundfish trips (i.e., less than 100 percent of trips would be monitored). A vessel would be required to declare its intent to use a 5.5-inch cod end to target redfish by submitting a Trip Start Hail through its VMS unit prior to departure. The hail would be used for monitoring and enforcement purposes. Hauls using this exemption would be considered the same strata as hauls using 6.5-inch cod ends; however, redfish trips would be a separate strata from non-redfish trips. The vessel trip report would be used to identify whether or not the 5.5-inch mesh was actually used on the trip. If a vessel declares the exemption but does not use the 5.5-inch mesh on a trip,, the restrictions associated with the exemption (e.g., thresholds) do notapply. The thresholds only apply to the portions of each trip that utilize the 5.5 inch mesh.

Under this exemption, vessels must fish as described below:

1. Vessels must declare their trip into the observer program under standard requirements, but there are no additional monitoring requirements above the target coverage for the groundfish fishery (i.e., ~26% in FY 14)

2. Prior to leaving the dock, any vessel that intends to use the redfish exemption on a trip must declare so through the VMS system. This notification must be made if the vessel intends to use 5.5 codend or larger to target Redfish on any portion of the trip.

3. Any vessel declaring this must submit catch reports each day for the entire trip, including Parts 1 and 2 of the trip as described below.

4. Vessels can use a 5.5 inch mesh and greater codend within the Redfish Exemption Area. The northern boundary ensures that the exemption is used in deeper water (i.e., greater than 50 fathoms). The "cod closure" consists of block 131, and would be closed seasonally in February and March due to concerns about GOM cod.

- *Part 1 of Trip*

5. Vessels may fish using a 6.0 inch mesh codend with selective gear in the GB Broad Stock Area (BSA; current mesh flexibility allowed from Council exemption est. in 2010) or 6.5 inch mesh codend in any BSA, including the Gulf of Maine. If a vessel intends to target redfish for their entire trip, the following requirements given in steps 6-8 do not apply.

6. Any sub-legal codend must be stowed below deck for the entire portion of the trip (transiting and fishing) using the current mesh flexibility, i.e. any codend below 6.0 inches when fishing with selective gear in the GB BSA and any codend below 6.5 inches when fishing with standard trawl gear in any BSA.

7. Once the vessel plans on switching codends to direct on redfish, they must first transit to the Redfish Exemption Area. Once the vessel is in the Redfish Exemption Area, they must declare that their vessel is switching to the 5.5 inch mesh codend (or larger) and will be conducting the remainder of their fishing activity for the trip exclusively in the Redfish Exemption area. The vessel can then retrieve the 5.5 inch mesh codend from below deck and begin using it.

Any catch thresholds do not apply for Part 1 of the trip.

Part 2 of Trip

7. Once the vessel is in the Redfish Exemption Area and declares a codend switch via VMS, it may retrieve the 5.5 inch mesh codend from below deck and begin using it. The vessel may use a 5.5 inch mesh codend (or greater) for the remainder of the trip in Redfish Exemption Area.

8. All fishing activity for the remainder of the trip may only occur in the Redfish Exemption area.

9. For all trips targeting redfish under Part 2 of the trip, at least 50% of the total allocated groundfish kept must be redfish, and;

10. For observed trips (NEFOP/ASM) targeting redfish under "Part 2" of the trip, total groundfish discards of allocated stocks (including redfish) from Part 2 of the trip may not exceed 5% of all kept fish (K_{all}).

11. The vessel must submit a final catch report and a Trip End Hail via VMS at the end of the trip.

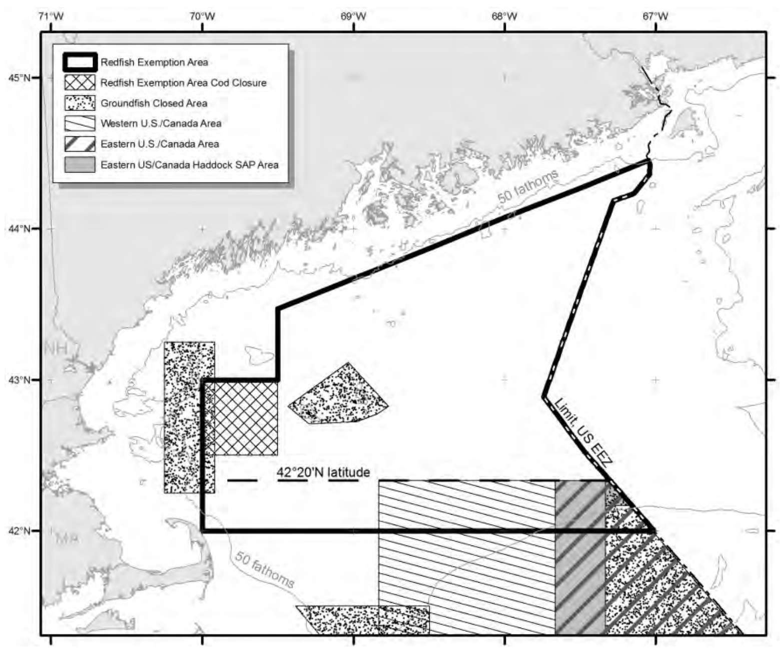

Figure 68. Proposed Redfish Exemption Area

The Redfish Exemption Area is bounded on the east by the U.S.-Canada Maritime Boundary, and bounded on the north, west, and south by the following coordinates, connected by straight lines in the order listed:

Point	N. Lat.	W. Long.	Note
A	44°27.25'	67°02.75'	
B	44°16.25'	67°30.00'	
C	44°04.50'	68°00.00'	
D	43°52.25'	68°30.00'	
E	43°40.25'	69°00.00'	
F	43°28.25'	69°30.00'	
G	43°00.00'	69°30.00'	
H	43°00.00'	70°00.00'	
I	42°00.00'	70°00.00'	
J	42°00.00'	(67°00.63')	(1)

1The intersection of 42°00' N. latitude and the U.S.-Canada Maritime Boundary, approximate longitude in parentheses.

Due to concerns about GOM cod, we have modified the redfish exemption area to exclude block 138 for the entire fishing year, and include block 131 as a seasonal closure. The area is bounded on the east, north, west, and south by the following coordinates, connected by straight lines in the order listed:

Point	N. Lat.	W. Long.
G	43°00.00'	69°30.00'
H	43°00.00'	70°00.00'
K	42°30.00'	70°00.00'
L	42°30.00'	69°30.00'
G	43°00.00'	69°30.00'

Reporting Requirements: Vessels will be required to submit unique VTRs per standard requirements, such as when they switch chart area, gear, and/or mesh size. The mid-trip "declaration" is primarily for enforcement purposes, to notify OLE/USCG that the vessel will retrieving its smaller codend from below deck, rather than allowing vessels to have the codend readily available on a second net reel.

Internal Sector Monitoring: The Sector will develop internal monitoring procedures that utilize to the extent practicable the same mathematical calculations adopted by the Agency to determine whether the sector is meeting either of the catch thresholds for redfish trips (as identified in the Trip Start Hail). The Sector acknowledges that ultimately the Agency will provide its own analysis that show whether the thresholds are being met.

Agency Sector Monitoring: Upon notification by the Agency that the Sector has not been meeting either of the catch thresholds, the Sector will be afforded one month (i.e. 30 days) to get into compliance. In the event the Sector fails to come into compliance with the catch thresholds, the Sector acknowledges that the Agency may withdraw authorization of this exemption to the Sector.

These proposed thresholds were determined after a review of the Components 2 and 3 of the REDNET report (Kanwit et al 2013; Pol and He 2013) (Table 79, Table 80, Table 81, Table 82) and NMFS redfish trip data. REDNET is a group that includes the Maine Department of Marine Resources, the Massachusetts Division of Marine Fisheries and the University of Massachusetts School for Marine Science and Technology joined with other members of the scientific community and the industry to develop a sustainable, directed, redfish trawl fishery in the Gulf of Maine. All five trips of Component 2, totaling 25 days, resulted in economically viable catches of redfish using a 4.5-inch mesh codend without substantial incidental/bycatch of regulated species. Effort was widely distributed spatially and temporally, entirely in the Gulf of Maine across the entire year. Depth did appear to effect the size composition of redfish, and pollock was the most abundant incidental catch, as historic participants in the redfish fishery indicated. REDNET Component 3 used trouser trawl to determine size selectivity of three mesh sizes, including a 5.5-inch mesh codend). The data collected through REDNET to date, and NMFS data from 2012 through 2014 indicate (not shown due to confidentiality concerns) that a targeted redfish fishery could be successful using a small mesh codend.

Table 79. REDNET Component 2 Discard Summary

	Cod	**Witch Flounder**	**Haddock**	**White Hake**	**Plaice**	**Pollock**	**Dogfish**	**Redfish**
Total REDNET catch (lbs)	1,180	125	1,059	2071	52	10,052	26,379	232,380
Total Discards (lbs)	141	8	87	43	18	2,745	26,379	10423
% Of Catch Discarded	12	6	8	2	35	27	100	4

Table 80. REDNET Component 2 Groundfish Catch and Discard Totals

	Groundfish (Excluding Redfish)	Groundfish (Including Redfish)
Total Catch (lbs)	14,581	246,960.8
Total Discards (lbs)	3,083.1	13,506.20
% of Catch Discarded	21.14	5.46

Table 81. REDNET Component 2 Redfish Catch

Total Groundfish Catch	246,960.8
Total Redfish Catch	232,380.2
% of Groundfish Catch That Was Redfish	94.1

Table 82. REDNET Component 3 Groundfish Catch (lbs) using a 5.5-inch mesh codend

	Redfish	Pollock	Cod	Haddock	White Hake	Plaice	Witch	Halibut	Total Non-Redfish	Total Catch	% Redfish
5.5 Mesh	1,817.9	1,050.1	213.4	48.9	14.3	15.4	3.7	13.4	1,359.4	3,177.3	57%

To further verify the appropriateness and effectiveness of the thresholds, NMFS reviewed observer data from vessels that declared a redfish trip exemption in FY 2012-2014. Based on the data from trips using the exemption, the thresholds were achieved by the fleet. Vessels that have declared this exemption may fish outside the redfish exemption area using approved gears (Part 1 of trip). Having this access to fish with other legal gears in addition to using this exemption provides flexibility to target other allocated stocks in addition to red fish, but each trip declaring into Part 2 of this exemption will still be considered in evaluating compliance with thresholds.

Due to concerns about GOM cod, we have modified the redfish exemption area to exclude block 138 for the entire fishing year, and include block 131 as a seasonal closure in February and March. The area is bounded on the east, north, west, and south by the following coordinates, connected by straight lines in the order listed:

Sectors seek to increase their revenues with this exemption by increasing their catch rate of redfish and catching a greater percentage of their redfish ACE. The area south of the Western Gulf of Maine closure may provide an opportunity for some smaller vessels to utilize this exemption and generate revenues from a fully rebuilt groundfish stock.

The exemption is intended to increase CPUE by retaining a greater proportion of the fish in the trawls codend. Since sector members would operate under an ACE, a minor increase in CPUE would result in fewer geardays.

Impacts to physical environment/habitat/EFH would likely be low positive because there would be a minor increase in CPUE, and a reduction in trawling geardays for redfish.

The exemption could result in greater retention of sub-legal groundfish. Pollock was the most abundant incidental catch observed in both the REDNET Component 2 report (Kanwit et al 2013), which explored redfish catch in the Gulf of Maine using a 4.5-inch mesh codend, and the REDNET Component 3 report (Pol and He 2013), which tested three mesh codends, including a 5.5-inch mesh codend, in the Gulf of Maine. While sector vessels fish under an ACE and all landings of allocated stocks are counted against that ACE, NMFS set minimum mesh sizes to reduce discard mortality and allow greater escapement of sub-legal groundfish, with the purpose of expanding the stock age structure and increasing yield-per-recruit and spawning stock biomass. However, certain provisions of this exemption would mitigate some of the adverse impacts of this exemption. The minimum landings threshold and the maximum discard allowance would limit the impact of the reduced mesh size on the non-redfish groundfish stocks. These provisions would ensure that the exemption is being used to target redfish and not other groundfish stocks.

For fishing year 2014, NMFS allowed vessels to use a 6-inch mesh codend when fishing for redfish in the Redfish Exemption Area, with standard monitoring coverage. Following approval of the exemption in fishing year 2014, sectors indicated that the codend mesh size was too large to effectively target redfish. They also indicated that the 80-percent threshold would not result in a profitable groundfish trip. As a result, few trips were taken under this exemption. In addition, the 80-percent threshold was based on cooperative research data using a 4.5-inch mesh codend, and the sectors argued that this threshold is not appropriate for different sized codends.NMFS is proposing to relax the threshold to 50 percent, from 80 percent in previous years, due to concerns from industry that the 80-percent threshold discourages the targeting of redfish as fishermen cannot be that efficient with 5.5-inch or 6.0-inch mesh. Indeed, data shows few vessels participating in the fishery in 2014. Although there is a possibility that a 50-percent threshold could encourage larger catch of non-redfish groundfish species, the trip requirements described above are designed to mitigate catch of other groundfish species. Further, NMFS will be montoring both the redfish catch threshold, and the 5-percent discard rate to determine whether vessels are using the 5.5-inch mesh to target groundfish other than redfish.

For fishing years 2015 and 2016, NMFS worked with sectors to modify this exemption request to help make it workable for both sectors and for NMFS. Rather than applying a threshold to an entire trip, a vessel would have the option to fish the first portion of a trip with current legal codend mesh size (6.5 inches), and then switch to a codend no smaller than 5.5 inches for the redfish portion of their trip. Allowing sectors to legally target groundfish on the first portion of the trip is intended to address the sector's concern regarding profitability. As indicated above, the sectors have requested a 50-percent catch threshold, which would only apply to the second half of the trip. The sectors argue that this threshold is more appropriate for a 5.5-inch codend, as indicated by data from REDNET Component 3, with the caveat that overall catch with the 5.5-inch mesh in this study was relatively low (Table 82). Therefore, overall impacts to allocated target species are expected to be low negative.

The exemption could also result in greater retention of non-allocated target species and bycatch. Spiny dogfish was the largest component of the bycatch observed in the REDNET Component 2 report (Kanwit et al 2013). Impacts to non-allocated target species and bycatch are expected to be low negative. However, non-allocated target species and bycatch have management measures in place to limit their catch and control mortality, with which sector vessels would still be required to comply. Assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACEs would likely limit the potential for impacts to non-allocated target species and bycatch. The minimum landings threshold and the maximum discard allowance would also limit the impact of the reduced mesh size on the non-allocated target species and bycatch. These provisions would ensure that the exemption is being used to target redfish and not non-allocated target species and bycatch. Therefore, when used together, both provisions would limit catch of non-allocated target species and bycatch.

Impacts to protected resources would be negligible because NMFS has no information that suggests that a mesh size reduction of 1 inch would change the nature of impacts to protected resources and the potential decrease in geardays is minor.

In order to utilize the mesh-size exemption, a fisherman would potentially have to purchase a new codend with mesh size under 6.5 inches, which is an upfront cost. Costs will be vessel specific, based on the trawl net and vessel size. Replacing the cod end for a small boat will be in the vicinity of $400-$500, while larger boats will cost about $2,000 (Bendiksen, Pers. Comm.). There is a range associated with net size, but also net materials. Larger nets are frequently made with heavier-gauge materials. If a vessel purchased an entire new net specialized to target redfish, costs would be greater.

By increasing operational flexibility this exemption would likely increase the expected short run profits of sector fishermen. If the exemption was revoked, as a result of the thresholds being met, a fisherman may not be able to recoup the costs and short run costs would exceed revenues. If disturbance to stock age structure slowed stock rebuilding efforts, long run profits may decrease. The resulting impacts human communities are likely to be low positive but could possibly be low negative in the long term.

Under the No Action Alternative for this exemption, sector vessels would be required to adhere to the existing minimum trawl codend mesh sizes specified for GOM, GB, SNE, and MA RMAs, regardless of the stock being targeted. Impacts to the physical environment/habitat/EFH would be low negative due to the exemptions likelihood of decreasing trawl days which have greater impacts relative to other gear. Impacts to protected resources would be negligible. Impacts to allocated target species and non-allocated target species and bycatch would be low positive because the rationale of improving stock age structure would be maintained. Impacts to human communities would likely range from low negative to low positive.

21. *6.5 inch Trawl Mesh Size Requirement to Target Small Mesh Species (silver hake, red hake, and squid) While on a Sector Trip in the SNE RMA*

Minimum mesh size restrictions for the GOM, GB, and SNE RMAs (§ 648.80(a)(3)(i), (a)(4)(i), (b)(2)(i)) were implemented under Amendment 13 (69 FR 22906, 4/27/04) in conjunction with other management measures, including FW 42 (71 FR 62156, 10/23/06) , to reduce overall mortality of groundfish stocks, change the selection pattern of the fishery to target larger fish, improve survival of sublegal fish, and allow sublegal fish more opportunity to spawn before entering the fishery.

FW 42 set requirements for trawl codends in the SNE RMA to be made of either square or diamond mesh no smaller than 6.5 inches. The minimum mesh requirements implemented by FW 42 are intended to reduce discards of yellowtail flounder thereby increasing the rate of yellowtail flounder rebuilding. Since the yellowtail flounder stock was not rebuilding quickly, even small improvements in rebuilding were considered important.

Small-mesh trawl gear is currently permitted within several exempted fisheries. These fisheries allow vessels to fish for specific species, such as whiting or squid, in designated, areas using mesh sizes smaller than the minimum mesh size allowed under the Regulated Mesh Area (RMA) regulations. No one may fish using a mesh smaller than those set in the regulations above unless they are eligible to participate in, and comply with all of the requirements of, a specific exempted fishery. To be approved and implemented by the Regional Administrator, exempted fisheries must have demonstrated that incidental catch of regulated species is less than 5 percent of the total catch, by weight, and that the exemption will not jeopardize fishing mortality objectives. Last year, NMFS evaluated catch data from trips in the proposed areas to determine the amount of groundfish caught on these trips, and on sector trips within the proposed area. This is a useful proxy in assessing how much groundfish would potentially be caught on future trips utilizing this exemption. For FY 2015/16 NMFS is proposing to expand the NLCA area 15 minutes to the north to 40 degrees 15 minutes (see coordinates given below). The data is given in Table 83 & Table 84. The NCLA expanded data is the expanded area that NMFS is proposing for FY 2015/16.

Table 83. FY12 Groundfish Landings from Groundfish Trips in NLCA Small Mesh Sector Exemption Area & Long Island Small Mesh Sector Exemption Area

FY 2012 Species	NLCA-Existing	NLCA-Expanded	Long Island
COD	15,456	49,795	10,569
HADDOCK	1,709	2,300	4,308
FLOUNDER, YELLOWTAIL	86,363	131,446	39,589
FLOUNDER, AMERICAN PLAICE /DAB	1,318	1,803	27,537
FLOUNDER, WITCH / GRAY SOLE	957	1,241	1,412

FLOUNDER, WINTER / BLACKBACK	5,609	9,386	30,559
REDFISH / OCEAN PERCH	739	838	2,114
HAKE, WHITE	175	256	16,108
POLLOCK	156	200	10,303
FLOUNDER, SAND-DAB / WINDOWPANE	12,106	19,448	44,847
OCEAN POUT	1,233	2,015	12,864
HALIBUT, ATLANTIC	251	383	359
WOLFFISH / OCEAN CATFISH	70	96	80

Table 84. FY13 Groundfish Landings from Groundfish Trips in NLCA Small Mesh Sector Exemption Area & Long Island Small Mesh Sector Exemption Area

Species	NLCA-Existing	NLCA-Expanded	Long Island
COD	7,286	45,617	9,562
HADDOCK	4,782	10,472	13,801
FLOUNDER, YELLOWTAIL	115,015	168,090	71,593
FLOUNDER, AMERICAN PLAICE /DAB	1,185	1,918	878
FLOUNDER, WITCH / GRAY SOLE	1,374	2,025	2,141
FLOUNDER, WINTER / BLACKBACK	31,019	84,883	439,178
REDFISH / OCEAN PERCH	6,088	10,835	493
HAKE, WHITE	249	390	142
POLLOCK	293	513	165
FLOUNDER, SAND-DAB / WINDOWPANE	20,726	36,057	91,147
OCEAN POUT	2,311	3,511	11,065
HALIBUT, ATLANTIC	598	996	287
WOLFFISH / OCEAN CATFISH	315	541	120

Sectors Small-Mesh Fishery Exemption Area 1 is bounded by the following coordinates connected in the order listed by straight lines, except where otherwise noted:

POINT	LATITUDE	LONGITUDE
A	40°39.2'N	73°07.0'W
B	40°34.0'N	73°07.0'W
C	41°03.5'N	71°34.0'W
D	41°23.0'N	71°11.5'W
E	41°27.6'N	71°11.5'W (1)
F	41°18.3'N	71°51.5'W
G	41°04.3'N	71°51.5'W (2)
A	40°39.2'N	73°07.0'W

(1) From POINT E to POINT F along the southernmost coastline of Rhode Island and crossing all bays and inlets following the COLREGS Demarcation Lines defined in 33CFR§80.
(2) From POINT G to POINT A along the southernmost coastline of Long Island, NY and crossing all bays and inlets following the COLREGS Demarcation Lines defined in 33CFR§80.

Sectors Small-Mesh Fishery Exemption Area 2 is bound by the following coordinates connected in the order listed by straight lines:

POINT	LATITUDE	LONGITUDE
H	41°15.0'N	71°20.0'W

I	41°15.0'N	70°00.0'W
J	40°27.0'N	70°00.0'W
K	40°27.0'N	71°20.0'W
L	41°15.0'N	71°20.0'W

In 2013 a similar exemption request was disapproved due to monitoring and enforcement concerns. Those concerns included the possibility that, through this exemption, a vessel could target allocated NE multispecies with small mesh, and therefore increase catch of juvenile fish, negatively affecting fish stocks. As stated above, sectors propose that vessels using this exemption be required to use trawl gear with one of the following gear modifications:

- drop chain sweep – minimum of 12” in length;
- large mesh belly panels – minimum of 32” mesh size; or
- excluder grate secured forward of the codend with an outlet hole forward of the grate – bar spacing of no more than 1.97” wide.

As discussed above these required gear modifications would help to eliminate the incentive for a sector vessel using this exemption to target groundfish, and could reduce possible bycatch of groundfish as these gear modifications have been shown to reduce, but not eliminate, the catch of legal and sub-legal groundfish stocks.

A vessel using this exemption would be subject to the same NEFOP and at-sea monitor coverage as standard groundfish trips (i.e., less than 100 percent of trips would be monitored). Trips declaring this exemption could only use small mesh in specific areas (see maps and coordinates below). The large mesh must be used first. After hauling the large mesh gear, the vessel would have to submit a Multispecies Catch Report via VMS, with all catch on board at that time. After the submission of the VMS Catch Report, the vessel would be authorized to deploy small mesh and the large mesh could not be redeployed. The two nets must be carried on separate net reels. The vessels would be required to declare their intent to use small mesh to target non-regulated species by submitting a Trip Start Hail through its VMS unit prior to departure; this would be used for monitoring and enforcement purposes. Each time the vessel switches mesh size or statistical area, it must fill out a new VTR. Any legal-sized allocated groundfish stocks caught during these small mesh hauls would be landed and the associated landed weight (dealer or VTR) would be deducted from the sector’s ACE.

Trips using this exemption will be a new discard strata treated separately than sector trips that do not declare this exemption. After one year, an analysis would be conducted to determine whether large mesh hauls on these trips should remain a separate stratum or be part of existing strata. On unobserved trips, the weight of the kept catch from these small mesh hauls would be included in the K_{all} computation for the assumed discard calculation. On observed trips, the weight of any observed discards of allocated groundfish stocks would be charged to the Sector’s ACE for the trip. The weight of these observed discards as well as the total weight of the observed kept catch (observed K_{all}) on the small mesh hauls will be included in the calculation of the sector’s discard rate for unobserved trips using this exemption. These monitoring protocols would help to ensure that vessels are not targeting groundfish, and would provide the necessary data needed to make that determination going forward.

The exemption is intended to increase CPUE by allowing for vessels to target different stocks with different gear types on the same trip instead of taking two different trips. Since sector members would operate under an ACE, a minor increase in CPUE would result in fewer geardays, however it is not possible to quantify this change.

Impacts to physical environment/habitat/EFH and protected resources would likely be low positive because the exemption would result in a reduction in trawling geardays and therefore, a reduction in potential interactions with these resources.

The data as shown in Table 83 and Table 84 show that groundfish is caught on sector trips within the proposed areas (including the expanded NCLA area) – specifically flounders. NMFS is proposing gear modifications as described above that would lessen the catch of groundfish species. All three gear modifications, when properly installed, have been demonstrated to reduce the bycatch of regulated groundfish, but none have been shown to completely eliminate bycatch. All of the modifications have the potential to harvest groundfish such as cod, pollock, hake, etc., especially if the gear is not fished appropriately. While the grid may reduce the bycatch of larger species, juveniles can still pass through and be captured by the gear. NMFS does not believe that it is likely that the exemption would create an incentive to harvest more groundfish with the smaller mesh sizes that are currently allowed within the exempted fishing area. However, it is possible that vessels fishing with small mesh could target groundfish if they encounter them after fishing for small mesh species. Such targeting could increase the catch of sub legal groundfish, and be a negative impact on these stocks. NMFS would monitor catch from these trips, and, if levels of Groundfish catch were to increase substantially, may take action to remove this exemption. NMFS has concerns over windowpane bycatch in small mesh within this area – especially given the accountability measure (AM). In fact, beginning in FY 2014, overlapping the exemption areas as requested, there will be an AM for the groundfish fishery due to high discards of windowpane flounder. However, vessels may not utilize the exemption in that area since the AM area would be closed to sector trips. If this area is closed, the impacts from this exemption may be mitigated, and the expected benefits may decrease depending on the desired location that vessels wish to fish with this exemption. Data shows that groundfish is caught within the proposed expanded area by vessels fishing on groundfish trips (Table 84). However, industry desires access to the expanded area as substantially more whiting and squid are caught within the additional area. Although NMFS recognizes the potential for an increase in groundfish catch within this expanded area, for the reasons discussed within this section, primarily the gear requirements and past catch data from this area, it is not likely that vessels will actively target groundfish when deploying small mesh in this area.

Further, small-mesh exempted fishery trips are only subject to the 8-percent NEFOP monitoring requirements, and do not receive ASM coverage. Therefore, the vast majority of NEFOP observers and at-sea monitors do not receive the training necessary to observe small-mesh fisheries, so we are concerned about accurately monitoring both the large mesh and small mesh portions of these proposed trips. In addition, we have some concern that observers and at-sea monitors could be viewed as playing an enforcement role when monitoring these trips. Lastly, there are other enforcement and monitoring concerns with the exemption as proposed. Traditionally, vessels use a single mesh-size to target a single fishery on a single trip, such as, using a 6.5-inch (16.5-cm) codend to target groundfish on a sector trip, or on a separate trip, use a 2.5-inch codend to target squid outside of the groundfish fishery. Allowing a vessel to participate in multiple targeted fisheries, using multiple mesh sizes, all on the same trip, makes enforcement far more difficult and compromises the reliability of monitoring these fisheries. As an example, the groundfish and exempted small-mesh fisheries each have their own trip declaration requirements (i.e., VMS), observer requirements, etc. The proposed exemption would essentially create a new strata of trips, that are no longer a groundfish trip or an exempted small-mesh trip, but a combination of the two.

Therefore, overall impacts to allocated target species are expected to be low negative due to the potential for vessels to target groundfish with small mesh and the difficulties associated with monitoring and enforcing these trips.

It is not anticipated that this exemption would result in an increase in catch of non-allocated target species. There are small-mesh exempted fisheries for some non-allocated target species in the exemption area proposed. However, we do not expect this exemption to increase the targeting of those stocks, rather the exemption should allow small mesh fishing to occur on groundfish trips rather than separate trips. In addition, non-allocated target species and bycatch have management measures in place to limit their catch and control mortality, with which sector vessels would still be required to comply. Assuming a relatively constant ratio of non-allocated target species and bycatch to allocated target stocks, ACEs would likely limit the potential for impacts to non-allocated target species and bycatch. The gear modifications would also limit the impact of the reduced mesh size on the non-allocated target species and bycatch. These provisions would help to ensure that the exemption is being used to target small mesh species such as whiting and squid and not non-allocated target species and bycatch. However, for the reasons stated above under the allocated target species analysis, given the amount of groundfish in the area, it is possible that vessels could use small mesh to target groundfish. If this occurs, non-allocated stocks may be negatively impacted if additional juvenile fish are caught. Therefore, impacts to non-allocated target species and bycatch are expected to be low negative to negligible.

By increasing operational flexibility this exemption would likely increase the expected short run profits of sector fishermen. If fishermen were to target groundfish using small mesh gear, and this were to threaten rebuilding objectives, long run profits may decrease. For the reasons discussed above, gear modification requirements are designed to limit the incentive to target groundfish, and as such, the resulting impacts human communities are likely to be low positive.

Under the No Action Alternative for this exemption, sector vessels would be required to adhere to the existing minimum trawl codend mesh sizes specified for GOM, GB, SNE, and MA RMAs, regardless of the stock being targeted. Vessels would not be able to fish with small mesh on declared sector trips. Impacts to the physical environment/habitat/EFH and protected resources would be low negative due to the exemptions likelihood of decreasing trawl days which have greater impacts relative to other gear. Impacts to allocated target species and non-allocated target species and bycatch would be low positive because the rationale of improving stock age structure would be maintained, and there would be less possibility for vessels to target groundfish with small mesh. Impacts to human communities would likely be low negative as additional flexibilities would not be realized.

Table 85. Summary of Direct and Indirect Effects of the Alternatives

	Valued Ecosystem Components (VECs)					
	Physical Environment	**Biological Environment**			**Human Communities**	
ALTERNATIVE		**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Alt 1 – FY 2014 Sector Operations Plans	Negl	Negl	Negl	Negl	L+	L+
Alt 2 – FY 2014 Sector Exemptions						
120 day gillnet block	Likely Negl	Negl	Negl	L-	L+	L+
20-day spawning block	Likely Negl	Negl	Negl	L-	L+	L+
Gillnet limit	Likely Negl	Likely Negl to L-	Likely Negl	L-	L-	L+
Hauling another vessels gillnet gear	Likely Negl	Likely Negl	Likely Negl	Likely Negl	L-	L+
50-net limit with DAS	Negl	Negl	L-	Negl	L+	L+
Limit on # of hooks	Negl	Negl	Likely Negl	Negl	L-	L+
DAS leasing size and HP restrictions	Negl	Negl	Negl	Negl	L+	L+
Discarding	Negl	Negl	Likely Negl	Negl	L+	L+
Daily Catch Reporting	Negl	Negl	Negl	Negl	L+	L+
Gear Requirements in the US/CA Area	L-	Negl	Negl	Likely Negl to L-	L+	L+
Maintain VMS at dock	Negl	Negl	Negl	Negl	L+	L+
Fishing inside and outside CA I Hook Gear Haddock SAP while on the same trip	Negl	Negl	Negl	Negl	L+	L+
Hauling another vessels hook gear	Likely Negl	Likely Negl	Likely Negl	Likely Negl	L+	Possible L-

Table 85 **(continued)**
Summary of Direct and Indirect Effects of the Alternatives

	Valued Ecosystem Components (VECs)					
	Physical Environment	**Biological Environment**			**Human Communities**	
ALTERNATIVE		**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Declare intent to fish in SAP/CA from dock	Negl	Negl	Negl	Negl	L+	L+
Seasonal Restrictions for Eastern US/Canada Haddock SAP	Negl	L-	Negl	Likely L-	L+	L+
Seasonal Restrictions for CA II YT/Haddock SAP	Negl	L-	Negl	Likely L-	L+	L+
EFP-like exemption for sampling	Negl	Negl	Negl	Negl	L+	L+
Access to Western Portion of Nantucket Lightship Closed Area	Negl to L-	L-	Negl to L-	L-	L+	L+
Access to Eastern Portion of Nantucket Lightship Closed Area	Negl to L-	L-	Negl to L-	L-	L+	L+
6-inch Mesh Size or Greater for Directed Redfish Trips	L+	L-	L-	Negl	L- to L+	L- to L+
6.5 inch Trawl Mesh Size Requirement to Target Small Mesh Species	L+	L--	Negl to L-	L+	L+	L+
Summary of Impacts for Alternatives 1, and 2	**Negl**	**Negl**	**Negl**	**Negl**	L+	L+

5.1.5 Impact Summary

Table 85 provides a summary of conclusions regarding direct and indirect impacts that would occur as a result of the various alternatives under consideration. Approval of sector Operations plans (Alternative 1) would generally have negligible impacts to the physical environment/habitat/EFH, allocated target species, non-allocated target species/bycatch, and protected resources. Alternative 1 would have positive impacts on human communities.

If the No Action Alternative is selected for Alternative 1, sectors would not operate in FY 2015/16. Relative to the approval of the alternatives, the change in impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources would be negligible. Under the No Action for Alternative 1 impacts to, human communities would be negative.

Under Alternative 2, sectors have requested 19 exemptions from the Northeast Multispecies regulations for FY 2014 (Table 3) that NMFS is proposing be approved for FY 2015/16. The overall impact of these exemptions on the physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources would likely be negligible as compared to the no action alternative. The impact on human communities is generally positive except where exemptions may slow stock rebuilding efforts or where the use of gear to hold ground could increase inter-vessel conflicts. If the No Action Alternative is selected for individual sector requested exemptions, all impacts associated with approval of the exemption would be foregone. For individual impacts of the No Action Alternative for each exemption please refer to Section 5.1.4.

5.2 CUMULATIVE EFFECTS ANALYSIS

The Center for Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1508.25) reference the need for a cumulative effects analysis (CEA). CEQ regulations define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action.” The purpose of a CEA is to consider the effects of the Proposed Action combined with the effects of many other actions on the human environment. The CEA assesses impacts 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. The CEA baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions which are described below. The present condition of the VECs is described in the affected environment (Section 4.0).

This CEA assesses the combined impact of the direct and indirect effects of sector operations plans and FY 2015/16 proposed exemptions analyzed for all 17 sectors with the impact from the past, present, and reasonably foreseeable future fishing actions. Additionally, it assesses factors external to the multispecies fishery that affect the physical, biological, and socioeconomic resource components of the groundfish environment. This analysis focuses on the VECs (see below) and compares the impacts of FY 2015 /2016 operations plans and associated exemptions for all sectors (Proposed Action) with the impacts of fishing under the common pool (No Action Alternative) as currently regulated by the Northeast Multispecies FMP and subsequent actions. The impacts of common pool fishing were previously assessed in the EIS and EAs associated with these actions. The final rule for Amendment 16 to the Northeast Multispecies FMP took effect on May 1, 2010. The Final EIS for Amendment 16 addresses the impacts of common pool fishing.

Valued Ecosystem Components (VECs): The CEA focuses on VECs specifically including:

- Physical environment/habitat/EFH
- Allocated target groundfish stocks;
- Non-allocated target species and bycatch;
- Protected resources; and
- Human communities (ports of sector operation and sector members).

Temporal and Geographic Scope of the Analysis: The temporal range considered for the habitat, allocated target species, non-allocated target species and bycatch, and human communities VECs, extends from 2004, the year that Amendment 13 was implemented, through April 30, 2021, the end of FY 2020. While this CEA considers the effects of actions prior to Amendment 13 (see Amendment 16 for a full cumulative effects analysis), the CEA focuses primarily on Amendment 13 and subsequent actions. Amendment 13 implemented the sector process and included major changes to management of the groundfish fishery, including substantial effort reductions. This CEA also emphasizes Amendment 16 since it expanded sector use and management regulations as well as added stricter management measures that apply to the common pool.

The temporal range considered for the protected resources VEC begins in the 1990's when NMFS started generating stock assessments for marine mammals and developed recovery plans for sea turtles that inhabit waters of the U.S. EEZ.

The CEA examines future actions through April 30, 2021. This is the end of FY 2020 and the period of approval for this action. This EA is programmatic in nature and analyzes the approval of sector operations plans for the next 6 fishing years.

The geographic scope considered for cumulative effects to physical environment/habitat/EFH, allocated target species, and non-allocated target species and bycatch consists of the range of species, primary ports, and geographic areas (habitat) discussed in Section 4.0 (Affected Environment). The range of each endangered and protected species as presented in Section 4.5 is the geographic scope for that VEC. The geographic scope for the human communities consists of those primary port communities from which sector vessels originate and/or land their catch.

5.2.1 Summary of Direct and Indirect Impacts of Proposed Action

Table 85 summarizes the direct and indirect effects on the VECs from the FY 2014 operations plans (Alternative 1) and sector requested exemptions (Alternative 2) compared to what the impacts would be if vessels remained or returned to the common pool.

The effects of sector operations plans (Alternative 1) would be negligible for physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, and protected resources. Impacts to sector ports and participants would be positive for Alternative 1.

The impacts of requested exemptions (Alternative 2) on physical environment/habitat/EFH would be primarily negligible with the exception of exemptions expected to increase trawl geardays or allow access to areas that previously prohibited bottom trawling. These exemptions, which include the relaxation of gear requirements in the U.S./Canada Area, and access to portions of the closed areas, would result in low negative impacts to the physical environment.

The impacts of requested exemptions (Alternatives 2) on allocated target resources were also found to be generally negligible with these exceptions. Negative impacts would be associated with both exemptions to access SAPs year round because, although ACEs provide the overall control on allocated target stock mortality, there is the potential for low negative impacts from fishing on spawning aggregations and the disruption of spawning behavior. Additionally the use of 5.5-inch mesh to target redfish could result in a low negative impact to allocated target species if the smaller mesh size results in greater catch of sub-legal groundfish. The exemption from the 6.5 Inch Trawl Mesh size to target small mesh multispecies could result in greater retention of smaller legal or discard of sub-legal groundfish. However, since the data shows a minimal groundfish catch using standard otter trawl and small mesh gears in these areas, it is likely that the gear modifications would further limit the impact of the reduced mesh size on groundfish stocks. As a result of the exemptions to access the closed areas the catch of some groundfish stocks may increase when sector vessels are targeting groundfish or monkfish and skates in these areas. However, since these vessels would be on a sector trip, all groundfish catch would be counted against the ACL which limits overall mortality.

With respect to non-allocated target species and bycatch, negative impacts may be associated with the exemption to the gillnet limit exemption because vessels fishing under current regulations are limited in the number of gillnets they may deploy: 100 gillnets (of which no more than 50 can be roundfish gillnets) in the GOM RMA; 50 gillnets in the GB RMA; and 75 gillnets in the SNE/MA RMAs. Under a requested exemption that limit would be increased to 150 gillnets per permit in all RMAs. Use of 5.5-inch mesh to target redfish could result in a low negative impact to non-allocated target species and bycatch if the smaller mesh size results in greater retention of sub-legal groundfish and other smaller non-allocated target species. The exemption from the 6.5 Inch Trawl Mesh size to target small mesh multispecies could result in greater retention of smaller legal or discard of sub-legal groundfish. However, since these vessels would be on a sector trip, all groundfish catch would be counted against the ACL which limits overall mortality. NMFS believes it is reasonable to expect low negative to negligible impacts to non-allocated species as a result of approving the year round closed area exemptions. However, non-allocated species such as monkfish, dogfish, and skates have management measures in place to limit the catch of these species and control mortality. The remaining sector requested exemptions would generally have negligible impacts on non-allocated target species and bycatch.

For protected species, an exemption from the 120-day gillnet block could allow vessels a greater number of days on the water potentially during the summer months when more protected species are present. A similar concern exists for an exemption from the 20-day spawning block. Although the change in geardays would be negligible, vessels would be permitted to fish in areas of increased abundance of fish where protected species may be present in larger numbers. The exemption to allow up to 150 gillnets in the water per permit, would also increase the likelihood of gear interactions with protected species due to the potential for increased geardays. The gear requirements in the U.S./Canada Area could result in a low negative impact to protected resources because trawl gear can be detrimental to protected resources. Concerning harbor porpoise, although there are several proposed exemptions that may result in an increase in gillnet geardays, the HPTRP helps to avoid the likelihood of significant cumulative impact because the New England portion of the HPTRP pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island east of 72° 30' W longitude. It includes time and area closures, some of which are complete closures. Others are closures to multispecies gillnet fishing unless pingers are used in the prescribed manner. The HPTRP also establishes "consequence closure areas," (these consequence closures will only be enacted if specified harbor porpoise bycatch rates are exceeded) in New England, which are specific areas of historically high harbor porpoise bycatch that will close seasonally if bycatch rates averaged over two consecutive management seasons indicate that harbor porpoise takes are greater than a specified bycatch rate. For more information on the HPTRP, please see the following NMFS website: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/. The impacts on protected resources from exemptions that would allow access to year round groundfish closed areas would range from low negative to negligible. Section 5.1.4 details the impacts of these exemptions on marine mammals, sea turtles, and Atlantic sturgeon.

Other notable impacts would occur in ports and to sector participants. The majority of exemptions would have low positive impacts to both of these VECs due to increased operational flexibility, increased profits and/or decreased costs. By removing the limitations on vessel effort (amount of gear used, number of days declared out of fishery, trip limits and area closures) these exemptions help to create a more simplified regulatory environment. Additionally, each exemption that removes the management control on effort will allow fishing ability to rise to expectations and reduce frustration.

Somewhat differently, exemptions to the gillnet limit, hauling another vessel's gillnet gear, hauling another vessel's hook gear and hook limits would have two effects: increased flexibility would increase revenues to sector participants (a positive impact), gear could be used to hold ground resulting in conflicts between fishermen (a negative impact). These two divergent effects are represented as a positive impact to sector participants but negative impacts to the ports where some of the conflicts may play out.

Both exemptions to access SAPs year round and the exemption to use 5.5-inch mesh to target redfish could have likely low positive impact on human communities in the short run but may have negative long run impacts if exemption related impacts to spawning aggregations of fish slow stock rebuilding efforts. Additionally, if increased fishing activity in the proposed GOM rolling closure blocks were to increase bycatch of harbor porpoises in the HPTRP that exemption may result in further negative impacts to human communities.

The exemption from the 6.5-inch trawl mesh size to target small mesh multispecies and the access to year round closed areas could increase operational flexibility and expected short run profits of sector fishermen. However, if disturbance to stock age structure slowed stock rebuilding efforts, long run profits may decrease.

Overall, the proposed action for Alternatives 1and 2 would result in negligible impacts on physical environment/habitat/EFH, allocated target species, and non-allocated target species, likely low negative impacts to protected resources, and low positive impacts to sector ports and participants.

5.2.2 Past, Present, and Reasonably Foreseeable Future Actions

Detailed information on the past, present, and reasonably foreseeable future actions that may impact this action can be found below.

5.2.2.1 Aggregate Sector Impacts

The amount of fish allocated to the commercial groundfish fishery, and sectors in the form of an ACE, as set in the annual specifications, provides for the greatest influence on trips, catch, and geardays. Additionally, sector operations plans are intended to ensure that operations do not result in new negative impacts to the physical environment and/or protected resources. The operational flexibility afforded to sectors (i.e., exemptions to increase fishing opportunities) may allow for an increase in geardays from targeting under-exploited stocks. However, the analyses in this document are made assuming the entire ACE could be harvested. In other words, an increase in catch from the previous year, as long as it does not exceed the ACE, should not create an unanticipated impact. It is also possible that increased efficiency resulting from sector exemptions could also act to increase catch per unit effort and reduce days fished.

Data (see Table 15) from FY 2009 through FY 2013 for sector trips show reductions in catch and trips, while geardays have risen. This could indicate that it is becoming harder to find stocks, and therefore, vessels are having to fish harder, or longer. As discussed in the FY 2014 EA, and in this document, the approval of sector exemptions in the past may have contributed to greater efficiencies that allow for increased exploitation of ACE, and non-allocated stocks. This may account for the increase in geardays in the gillnet fishery.

The FY 2015/16 sector-specific harvest rules, and sector-specific exemptions, have been discussed in Section 5.1 and are incorporated into the sector-specific impacts represented in Table 85. In aggregate, if all alternatives were adopted, they would have negligible impacts on physical environment/habitat/EFH, allocated target species, and non-allocated target species and bycatch. While the aggregate impact of adopting all alternatives would be low negative for protected resources, aggregate impacts to human communities would be low positive.

Impacts related to general sector operations are considered below and summarized in Table 86.

Proportion of ACL

The total amount of groundfish that is permitted to be caught by the commercial multispecies fleet is called the ACL. FY 2015 is the sixth year in which ACLs will be set for most stocks, in order to be in compliance with revisions to the Magnuson-Stevens Act. AMs have been put into place to ensure that landings by common pool and sector vessels do not exceed the ACL.

Based on the FY 2014 sector rosters, roughly 60 percent of the permits in the Northeast Multispecies fishery were enrolled in sectors, while the other half remained in the common pool. In FY 2014 the permits enrolled in sectors accounted for most all historical fishing effort (see Figure 69). The proportion of ACL that is linked to the permits enrolled in sectors (i.e., potential sector contribution) was approximately 90 percent for each Northeast groundfish stock,; however, as discussed in Section 5.0, we assume for the purpose of this analysis that 100% of the NE multispecies ACL is allocated to sectors. The ACE for each sector is determined by multiplying the summed PSC of all members by the commercial sub-ACL for each stock. The proportion of ACLs in sectors and the common pool is illustrated in Figure 69 in FY 2014. We expect little change in the next 6 years, and the roster deadline for FY 2015/16 has been extended such that the roster is not available for inclusion in the EA. Although the roster data provides some baseline information on the fishery, as stated earlier in the EA, this sector EA assumes that 100 percent of the fishing effort could occur in sectors.

The potential impacts of the proportion of ACL in sectors is likely to be negligible to physical environment/habitat/EFH, allocated target stocks, non-allocated target species and bycatch, and protected resources, since there would likely be little potential for change in the potential amount of catch, which would be controlled by ACEs for each sector. However, the catch may increase for abundant stocks such as haddock because of the increased flexibility to selectively target these stocks with gear specifically designed for this purpose. Sector participants would likely benefit from the ability to fish their ACE, which represents the majority of the ACL for the fleet, without effort control restrictions. This added flexibility, which would result in increased revenues, would result in low positive impacts to the sectors' ports.

Figure 69. Percentage of Allocated Target Stocks in All Sectors and the Common Pool for FY 2014

Inter-Sector Transfer of ACE

Each sector is able to adjust its allocations by transferring ACE among sectors to facilitate targeted fishing of underutilized stocks and take advantage of various financial opportunities to maximize profits. These ACE transfers may occur during the fishing year and for up to two weeks after the end of the fishing year (following data reconciliation) in order to "provide[s] a limited opportunity for a sector to quota balance in the instances that ACE was inadvertently exceeded." These provisions do not provide for the permanent transfer of sector shares, but allow sectors to avoid inadvertent overages and avoid potential enforcement action or penalties if ACE is exceeded. The ability to transfer ACE within an allotment period results in a net increase of zero, having no impact on achieving target mortality rates. In addition, this provision provides a disincentive to discard catches that may exceed the ACE, and the ability to carry-over ACE into the following fishing year discourages fishing right up to the maximum amount allowed (Sanchirico et al. 2006). This provision would have a low positive impact on human communities because it would allow some flexibility in covering inadvertent overages of a sector's ACE and provides an option to avoid enforcement actions and/or penalties, and greater utilization of allocations, resulting in more landings. Further, the ability to trade ACE would allow sectors to acquire additional fishing opportunities that would result in a positive impact on human communities. This would potentially result in a greater proportion of allocated ACE being caught because sectors unable to fully utilize their ACE could trade ACE to sectors with the harvesting capacity that would otherwise go unused. The impacts to the physical and biological environments are likely negligible, since this provision would allow for minor deviations from a sector's given ACE.

Consolidation of Permits

Most sectors have indicated that some of their sector members would not actively fish. While it initially appears that fewer vessels would be fishing as a result of sectors, many of these permits/vessels were previously inactive because of the DAS Leasing Program and mortality controls established to rebuild groundfish stocks. In FY 2004, Amendment 13 brought the opportunity for fleet consolidation through the implementation of the DAS Leasing Program and, to a lesser extent, from the DAS Transfer Program. Accordingly, additional fleet-wide consolidation would take place only to the extent that additional consolidation occurs beyond that which resulted from the leasing and transfer programs in past years or would happen under those programs in FY 2015/16.

The severity of the social implications that result from sector operations are difficult to predict. NMFS cannot predict the exact consolidation because sector rosters may change and members currently enrolled in sectors are still able to withdraw to the common pool through April 30, 2015. Depending on the fleet composition of the sectors and the distribution of ACE amongst sectors, it is possible that specific gear types or geographic regions could be disproportionately impacted. Overall, sectors expect that, compared to FY 2014, there would be little to no change from the consolidation that previously occurred within the sector during FY 2014. In this case, most sectors anticipate that a member who owns multiple permits and fished all those permits on a single hull will now continue to fish the harvest share contributed by all of those permits on the same single hull, resulting in no additional consolidation. Please see Section 4.6.8.3 for a discussion of past consolidation in the groundfish fishery. Based on the sector's minor consolidation predictions it is anticipated that there would be negligible impacts to all VECs associated with permit consolidation.

Redistribution of Effort

On a related note, fishing effort may be redistributed from the Northeast Multispecies fishery into other fisheries due to improved fishing efficiency, selectivity, or consolidation among vessels that historically fished for Northeast multispecies. Under this scenario, it is possible that fishing effort could be redistributed amongst different gear types and/or different fishing areas, or that the fleet composition could change. It is likely that effort would shift towards fisheries open access fisheries that are managed under effort controls or into fisheries that are not overfished or undergoing overfishing. Two examples to illustrate these scenarios are provided:

1. If gillnetters are able to successfully target haddock, an increase in gillnet effort may result because of the abundance of haddock and the replacement of broad effort controls with stock-specific mortality controls.
2. Vessels within sectors that also have lobster permits could decide to lease their multispecies quota to larger vessels and instead target American lobster stocks with gear not capable of catching Northeast multispecies.

It is difficult to predict how the social, economic, and biological impacts of effort shifts caused by sectors would compare to, or interact with, the social, economic, and biological impacts of effort shifts from the increased effort controls on the common pool under Amendment 16 and subsequent frameworks. However, data indicates that vessels enrolled in sectors increased their fishing effort in both the American lobster and northern shrimp fisheries. The opportunity for this type of effort redistribution has existed since implementation of the DAS Leasing and DAS Transfer Programs, which were implemented in Amendment 13 (69 FR 22906, 4/27/2004). Accordingly, additional redistribution of effort is likely only to the extent that additional consolidation occurs beyond that which resulted from the DAS Leasing and Transfer Programs. In other words, it is likely that higher rates of consolidation would lead to a greater redistribution of effort. How much effort is redistributed by individuals enrolled in a sector compared to what is anticipated within the common pool is difficult to predict. Most sectors predict that there would be no additional consolidation of permits as a result of sector operations, and consequently there would be no further expected redistribution of effort due to the operation of sectors. It is also worth noting that the Northern shrimp fishery remains closed, and there are further restirctions on the lobster fishery that will restrict participation. Based on this prediction, it is anticipated that there would be negligible impacts to all VECs associated with redistribution of effort due to ongoing sector operations. However, further reductions in groundfish ACE may result in effort shift into other fisheries.

Monitoring

Because the primary control to regulate fishing by sectors would be the ACE for each stock, sectors must monitor catch to ensure that the sector allocation is not exceeded. Sectors must comply with the at-sea monitoring program, which provides information on discards. Since the majority of the allowed catch for the fishery would be associated with sectors, a greater proportion of the groundfish stocks would be monitored. More monitoring data would be generated, covering a larger percentage of the groundfish stocks, which would be a positive contribution for stock assessments and future regulation that rely on these assessments. Allocated target stocks, non-allocated target species and bycatch, and protected resources would experience a low positive cumulative impact since additional monitoring would provide information for more effective management of the fishery and a better understanding of interactions between fisheries and protected species. There would be a negligible effect on habitat, and a low negative impact on human communities due to the increased monitoring and enforcement costs.

Summary of Impacts from Sector Operations

Overall, the cumulative impacts associated with all sector operations are as follows: Negligible impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch; and protected resources; and low positive impacts to the human communities.

Table 86. Summary of Aggregated Sector Impacts

	Physical Environment	Biological Environment			Human Communities	
Sector	Physical Habitat (including EFH)	Allocated Target Species	Non-allocated Target Species and Bycatch	Protected Resources	Ports	Sector Participants
AGGREGATE SECTOR IMPACTS						
Proportion of ACL	Likely Negl	Negl	Negl	Negl	L+	L+
Inter-Sector transfer of ACE	Negl	Negl	Negl	Negl	L+	L+
Consolidation of Permits	Negl	Negl	Negl	Negl	Negl	Negl
Redistribution of Effort	Negl	Negl	Negl	Negl	Negl	Negl
Monitoring	Negl	L+	L+	L+	L-	L-
Summary of Impacts	Negl	Negl	Negl	Negl-	L+	L+

5.2.3 Other Fishing Effects: Past, Present, and Reasonably Foreseeable Future Groundfish and Related Management Actions

Table 87 is a summary of the past, present, and reasonably foreseeable future fishing actions and effects. The impact assessment terms (i.e., positive, negative, negligible) are for the impacts associated with the action on the VECs discussed in Section 4.0. Specifically, the VECs include: the physical environment/habitat/EFH; allocated target species; non-allocated target species and bycatch; protected resources such as marine mammals and sea turtles; and the human communities of ports as well as the sector participants.

Table 87. Summary of Effects on VECs from Past, Present, and Reasonably Foreseeable Future FMP and Other Fishery Related Actions with the Exception of Sector Operations

	Physical Impacts	Biological Impacts			Human Community Impacts	
Fishing Actions	**Habitat/EFH**	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
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+ Reductions in fishing effort expected to reduce contact time and aerial extent of fishing gear on EFH.	H+ Fishery Management Plan action further addresses overfished and overfishing status of allocated target species by reducing mortality through additional effort reductions.	+ Reduction in fishing effort results in reduction of bycatch for many species. Reduced fishing effort also reduces mortality on other non-allocated target species.	L+ Further reductions in fishing effort via DAS cuts when combined with previously established Closed Areas reduce the potential for gear interactions.	H- short-term, L+ long-term. Regulations negatively impacted fishing communities in the short-term Reductions expected to lead to more robust stocks in the long-term.	H+ Created sectors and increased efficiency of sector members, decreased overhead costs. Community initiative resulted in conservation effort.
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 Due to limited impact of hook gear.	L- Increased mortality, for GB haddock Designed not to compromise Amendment 13 mortality objectives.	L- Increased effort results in slight incidental mortality Incidental catch minimized by time/area/bait type limitations.	Negl Gear interactions not expected to increase in any significant way.	+ Provided increased revenue to homeports of hook vessels Enhanced importance of industry involvement.	+ Increased revenue to Hook Sector members NEGL For non-hook vessels or non-sector members Participation in collaborative research that brought about sustainable fishing opportunities.

Table 87 (continued)						
	Physical Impacts	**Biological Impacts**			**Human Community Impacts**	
Fishing Actions	**Habitat/EFH**	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Past and Present Fishing Actions						
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+ Potential for decreased impacts because a larger portion of the GB cod stock will be taken with hook gear which has been shown to have negligible impacts to habitat.	L- Short-term increase in effort; minor increase in mortality on GB haddock; not expected to threaten Amendment 13 mortality objectives.	L- Increased effort results in slight incidental mortality. Incidental catch minimized by time/area/bait type limitations.	Negl	L+ Minor benefits gained through relaxed leasing and transfer rules and improvements to the management of the yellowtail flounder SAP that were intended to reduce derby fishing conditions.	L+ Minor benefits gained through increased revenues resulting from a greater allocation of the GB cod TAC based on historical catch landings with gear other than hook gear. Increased revenue due to the removal of gillnet limits on trip vessels.
FW41 (2005) – Allowed for participation in the Hook Gear Haddock SAP by non-sector vessels	Negl	Negl Extended access to Haddock SAP for non-sector vessels which encourages effort on Georges Bank haddock, a healthy stock, and thus away from stocks of greater concern.	Negl to L - Allows for a small overall effort increase which could allow for higher bycatch/discard rates.	Negl	L+ Provided non-Hook sector community members the opportunity to participate in the Haddock SAP, but capped SAP effort.	L - Economic benefits to sectors would be less than non-sector participants because the incidental cod catch limit for sectors is smaller than it is for non-sector vessels.

Table 87 (continued)

	Physical Impacts	Biological Impacts			Human Community Impacts	
Fishing Actions	**Habitat/EFH**	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Past and Present Fishing Actions						
FW42 (2006) – Implemented further reductions in fishing effort based upon stock assessment data and stock rebuilding needs, implemented GB Cod Fixed Gear Sector	L+ Effort reductions may have positive impacts due to less bottom time.	+ Implemented further reductions in fishing mortality for groundfish species, put further catch limits on GB cod.	+ Reduced mortality on target species through effort reductions results in a reduced rate of bycatch/ discards.	L+ Further effort reductions likely resulted in lower risks of gear interaction.	- short-term, L+ long-term Disproportionate effects on these groundfish-dependent ports. Long-term benefits from reduced mortality.	+ Allowed additional gear type to gain the efficiencies and other benefits of sector membership.
Atlantic Large Whale Take Reduction Plan	Negl to L- Requires use of sinking groundline, which may sweep bottom. Also potential for "ghost gear" due to weak links in gillnet line.	Negl	Negl	+ Regulations implemented to protect large whales are expected to have a positive impact by reducing incidental takes.	L- to Negl	L- for gillnetters because weak links must be added to gillnets.
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+ Reduction in fishing effort results in less habitat-gear interaction.	+ Monkfish management actions have reduced fishing effort over the last decade, which has resulted in positive impacts for groundfish.	+ Monkfish management actions have reduced fishing effort over the last decade, and would continue positive impacts for monkfish stocks	+ Reduction in fishing effort results in less gear interaction.	L- short-term L+ long-term Reduction in fishing effort while stock rebuilds means less revenue. Long term benefits due to sustainable fishery.	L- short-term L+ long-term Reduction in fishing effort while stock rebuilds means less revenue. Long term benefits due to sustainable fishery.

Table 87 (continued)						
	Physical Impacts	Biological Impacts			Human Community Impacts	
Fishing Actions	Habitat/EFH	Allocated Target Species	Non-allocated Target Species and Bycatch	Protected Resources	Ports	Sector Participants
Past and Present Fishing Actions						
Spiny Dogfish Fishery Management Plan	Negl Most of the landed dogfish catch has historically been landed with bottom gillnets rather than bottom trawls, therefore, negligible impact on habitat.	Negl Dogfish is caught incidentally in the multispecies fishery	+ Spiny dogfish stock is not overfished and overfishing is not occurring.	Negl	L+ The species is no longer considered overfished nor is overfishing occurring. FY 2010 through 2012 specifications increased the quota.	L+ The species is no longer considered overfished nor is overfishing occurring. FY 2010 through 2012 specifications increased the quota.
Amendment 16 to the Northeast Multispecies FMP (2009) Implemented DAS reductions and gear restrictions for the common pool, approved formation of additional 17 sectors	+	+	+	+	- short-term, L+ long-term	- short-term, L+ long-term

Table 87 (continued)						
	Physical Impacts	Biological Impacts			Human Community Impacts	
Fishing Actions	Habitat/EFH	Allocated Target Species	Non-allocated Target Species and Bycatch	Protected Resources	Ports	Sector Participants
Past and Present Fishing Actions						
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	+	+	+	+	- short-term, L+ long-term	- short-term, L+ long-term

Table 87 (continued)						
	Physical Impacts	Biological Impacts			Human Community Impacts	
Fishing Actions	Habitat/EFH	Allocated Target Species	Non-allocated Target Species and Bycatch	Protected Resources	Ports	Sector Participants
Past and Present Fishing Actions						
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+	L- short term L+ long term	L- short term L+ long term
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	Negl to L-	Negl to L-

Table 87 **(continued)**						
	Physical Impacts	**Biological Impacts**			**Human Community Impacts**	
Fishing Actions	**Habitat/EFH**	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Past and Present Fishing Actions						
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 -	Likely -
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+	L+

Table 87 **(continued)**						
	Physical Impacts	**Biological Impacts**			**Human Community Impacts**	
Fishing Actions	**Habitat/EFH**	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Past and Present Fishing Actions						
Amendment 17 to the Northeast Multispecies FMP This amendment looks to streamline the administration process whereby NOAA-sponsored, state-operated permit banks can operate in the sector allocation management program	Negl	Negl	Negl	Negl	Negl	Negl
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	-	-

Table 87 **(continued)**

Fishing Actions	Physical Impacts	Biological Impacts			Human Community Impacts	
	Habitat/EFH	Allocated Target Species	Non-allocated Target Species and Bycatch	Protected Resources	Ports	Sector Participants
Past and Present Fishing Actions						
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 refined the management of yellowtail flounder bycatch in the scallop fishery	Likely Negl	Likely Negl to L+	Likely Negl to L+	Likely Negl	Likely - to +	Likely - to +
Framework 48 to the Northeast Multispecies FMP Reduced costs, added flexibility for groundfish vessels and implemented accountability measures for non-allocated stocks.	Likely Negl	Likely Negl	Likely Negl	Likely Negl	Likely +	Likely +
Framework 50 to the Northeast Multispecies FMP Adopted FY2013-2015 ACLs and specifications for the U.S./Canada Total Allowable Catches (TACs),	Likely +	Likely +	Likely +	Likely Negl	Likely -	Likely -
Fishing Year 2013: Additional Exemptions: Year-Round Closed Areas Granted limited access to eastern and western portions of NLCA	Negl to L-	L-	Negl to L-	L-	L+	L+

Table 87 **(continued)**

Fishing Actions	**Physical Impacts**	**Biological Impacts**			**Human Community Impacts**	
	Habitat/EFH	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
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	ND
Harbor Porpoise Take Reduction Plan (Potential Future Actions) Future changes to the plan in response to additional information and data about abundance and bycatch rates.	Likely L+	Likely +	Likely +	Likely +	Likely -	Likely -
Amendment 3 to the Spiny Dogfish FMP This amendment considers the establishment of 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+	Likely L+

Table 87 **(continued)**

Fishing Actions	Physical Impacts: Habitat/EFH	Biological Impacts: Allocated Target Species	Biological Impacts: Non-allocated Target Species and Bycatch	Biological Impacts: Protected Resources	Human Community Impacts: Ports	Human Community Impacts: Sector Participants
Reasonably Foreseeable Future Fishing Actions						
FW 51 to the Northeast Multispecies FMP The framework considers new rebuilding programs for Gulf of Maine cod and American plaice; Quotas for white hake, Georges Bank (GB) yellowtail, and Eastern GB cod and haddock.; Small-mesh fishery accountability measures for GB yellowtail; A U.S./Canada quota trading mechanism; A mechanism to allow sectors to convert Eastern GB haddock quota into Western GB quota; Revised discard strata for GB yellowtail; and Zero retention of yellowtail flounder for scallop vessels	Likely +	Likely +	Likely +	Likely Negl	Likely -	Likely -
FW 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	ND	ND	Likely Negl	Likely – to +	Likely – to +
FW 52 to the Multispecies FMP This framework implemented accountability measures for southern and northern windowpane flounder if certain criteria	Likely +	Likely +	Likely +	Likely Negl	Likely -	Likely -

are met.						
FW 53 to the multispecies FMP The framework sets specifications for FY2015, and proposed modifications to rolling closure areas.	Likely +	Likely +	Likely +	Likely Negl	Likely -	Likely -

Noted: ND= Not determined

5.2.3.1 Physical Environment/Habitat/EFH

As indicated in Table 87, management measures in Amendment 13, FW 42, Amendment 16, Amendment 3 to the Skate FMP, FW 44 and FW 45 have (or would be expected to have) positive effects on habitat due to reduced fishing efforts, consequently reducing gear interaction with habitat. The HPTRP could result in seasonal closures. These closures would result in a low positive impact by reducing fishing effort and the associated bottom interactions. Further, the omnibus EFH amendment would result in targeted habitat protection. This would have positive effects on benthic habitat and physical resources. FWs 40A, 40B, and 41 resulted in negligible to low positive effects on habitat by decreasing bottom impacts as more cod is caught with low impact fixed gear. The ALWTRP resulted in low negative to negligible effects on habitat due to the required use of a sinking groundline which may sweep the bottom and the potential for "ghost gear." The dogfish and scallop FMPs generally increased fishing effort for certain species and generally resulted in negligible to low negative effects on habitat. The Monkfish FMP has generally resulted in positive impacts on habit through fewer habitat and gear interactions. Amendment 17 is administrative in nature and would have negligible impacts on habitat. Framework 46 is not expected to lead to an increase in the frequency of bottom contact by fishing gear, and as such, is projected to have a negligible impact on physical environment/habitat and EFH. Framework 47, 48 resulted in relatively minor adjustments in the context of the fishery as a whole and is expected have negligible impacts on EFH. FW 50 resulted in decreased quotas, and likely has reduced impacts on EFH. FW 51 updateed to rebuilding programs for Gulf of Maine cod and American plaice; quotas for white hake, Georges Bank (GB) yellowtail, and Eastern GB cod and haddock, and Zero retention of yellowtail flounder for scallop vessels. These measures have the potential to reduce quotas and lessen impacts on habitat. FW 53 proposes to set specifications for groundfish, and lowering many quotas, a positive benefit for habitat.

Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions have resulted in positive effects on habitat.

5.2.3.2 Allocated Target Species

Amendment 13, FW 42, Amendment 16, FW 44, FW 45, FW 47, FW 48, FW50, FW51, FW52, and FW53 have had (or would be expected to have) positive effects on allocated target species. Other FMPs that affect other species landed by groundfish sectors also result in positive effects on allocated target species. Future measures that will likely restrict fishing effort (EFH Omnibus, HPRTP) would also likely have positive effects on allocated target species. Actions that increase fishing effort (i.e., FWs 40A, 40B, 41) had low negative or negligible effects on allocated target species. As such impacts would be negligible to allocated target species. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions have resulted in positive effects on allocated target species.

5.2.3.3 Non-allocated Target Species and Bycatch

As indicated in Table 87, actions that reduce fishing effort have had positive effects on non-allocated target species and bycatch because in general, less fishing effort results in less impact from fishing on non-allocated target species and bycatch. Further FMPs developed for non-allocated target species (such as monkfish, dogfish, and skates) have resulted in positive impacts to these species. However, recent groundfish actions that reduce fishing effort may not have benefited non-allocated target species to a great extent, due to the percentage of these species caught as bycatch, and increased targeting of non-groundfish species. Conversely, actions that increase fishing effort (i.e., FW 40A, FW 40B, FW 41) are considered to have low negative or negligible effects on non-allocated target species and bycatch because more fishing generally results in more non-allocated target species and bycatch. Recent multispecies frameworks contain measures that control fishing mortality. Therefore, impacts to non-allocated target species are expected to be positive. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions have resulted in positive effects on non-allocated target species and bycatch.

5.2.3.4 Protected Resources

As indicated in Table 87, management actions that reduce fishing effort also reduce gear interaction with protected resources, resulting in positive effects. FWs 40A, 40B, and 41 allowed minor increases in fishing, which have negligible to low negative impacts on protected resources. With the exception of the EFH Omnibus Amendment, all other management actions described were designed to benefit or be negligible to protected resources. Therefore, these actions are all considered to have positive effects on this VEC. Overall, the cumulative effect of these past, present, and reasonably foreseeable future fishing actions have resulted in positive effects on protected resources.

5.2.3.5 Human Communities

As indicated in Table 87, the effects of past, present, and reasonably foreseeable future fishery management actions have been positive on nearly all VECs with the exception of human communities. Mandated reductions in fishing effort have resulted in negative economic impacts to human communities. Management measures designed to benefit protected resources and restrict fishing effort have low negative effects on the human communities. However, the establishment of ACLs through sectors and the ultimate goal of rebuilding groundfish stocks to sustainable levels will benefit the human communities eventually. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions have resulted in negative effects on human communities in the short term and a positive effect on human communities in the long-term.

5.2.4 Non-Fishing Effects: Past, Present, and Reasonably Foreseeable Future Actions

Non-fishing activities that occur in the marine nearshore and offshore environments and their watersheds can cause the loss or degradation of habitat and/or affect the species that reside in those areas. Table 88 provides a summary of past, present, and reasonably foreseeable non-fishing activities and their expected effects on VEC's in the affected environment. The following discussions of impacts are based on past assessments of activities and assume these activities will likely continue into the future as projects are proposed. More detailed information about these and other activities and their impacts are available in the publications by Hanson (2003) and Johnson et al. (2008).

Table 88. Summary of Effects on VECs from Past, Present, and Reasonably Foreseeable Non-fishing Actions in the Affected Environment

Non-Fishing Actions	Physical Environment Impacts	Biological Environment Impacts			Human Community Impact	
	Habitat	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Protected Resources**	**Ports**	**Sector Participants**
Past, Present, and Reasonably Foreseeable Future Actions						
General Construction and Development Activities	- in nearshore Likely L- in offshore	Likely L-	Likely L-	Likely L-	Negl	Negl
Point and non-point source (agricultural/urban runoff) pollution	- in nearshore L- in offshore	Likely L-	Likely L-	Likely L-	Negl	Negl
Offshore disposal of dredged materials	L-	Likely L-	Likely L-	Likely L-	Negl	Negl
Beach Nourishment	L-	Likely L-	Likely L-	Negl	Negl	Negl
Installation of offshore wind farm and infrastructure	Likely L-	Likely L-	Likely L-	Likely L-	Likely L-	Likely L-
Installation of infrastructure associated with liquefied natural gas terminal	Likely L-	Likely L-	Likely L-	Likely L-	Likely L-	Likely L-
Restoration Activities (wetland restoration, artificial reefs, eelgrass, etc…)	+	+	+	+	+	+
Implementation of National Marine Fisheries Service Final Rule on Ship Strike Reduction Measures	Likely Negl	Likely Negl	Likely Negl	Likely +	Likely Negl	Likely Negl
Summary of Impacts	**- to L-**	**L-**	**L-**	**L-**	**Negl to L-**	**Negl to L-**

Note:

Unless noted otherwise, the impacts of most of these actions are localized and although considered negative at the site, they have an overall low negative or negligible effect on each VEC due to limited exposure of action to the population or habitat as a whole.

Construction/Development Activities and Projects: Construction and development activities include, but are not limited to, point source pollution, agricultural and urban runoff, land (roads, shoreline development, wetland loss) and water-based (beach nourishment, piers, jetties) coastal development, marine transportation (port maintenance, shipping, marinas), marine mining, dredging and disposal of dredged material and energy-related facilities. All these activities are discussed in detail in Johnson et al. (2008). These activities can introduce pollutants (through point and non-point sources), cause changes in water quality (temperature, salinity, dissolved oxygen, suspended solids), modify the physical characteristics of a habitat or remove/replace the habitat altogether. Many of these impacts have occurred in the past and present and their effects would likely continue in the reasonably foreseeable future. It is likely that these projects would have negative impacts caused from disturbance, construction, and operational activities in the area immediately around the affected project area. However, given the wide distribution of the affected species, minor overall negative effects to offshore habitat, protected resources, allocated target stocks, and non-allocated target species and bycatch are anticipated since the affected areas are localized to the project sites, which involve a small percentage of the fish populations and their habitat. Thus, these activities for most biological VECs would likely have an overall low negative effect due to limited exposure to the population or habitat as a whole. Any impacts to inshore water quality from these permitted projects, including impacts to planktonic, juvenile, and adult life stages, are uncertain but likely minor due to the transient and limited exposure. It should be noted that wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality. As such, they may indirectly constrain the sustainability of the allocated target stocks, non-allocated target species and bycatch, and protected resources.

Restoration Projects: Regional projects that are restorative or beneficial in nature include estuarine wetland restoration, offshore artificial reef creation, and eelgrass (*Zostera marina*) restoration. These types of projects improve habitats, including nursery habitats for several commercial groundfish species. Due to past and present adverse impacts from human activities on these types of habitat, restorative projects likely have slightly positive effects at the local level.

Protected Resources Rules: The NMFS final Rule on Ship Strike Reduction Measures (73 FR 60173, October 10, 2008) is a non-fishing action in the U.S.-controlled North Atlantic that is likely to affect endangered species and protected resources. The goal of this rule is to significantly reduce the threat of ship strikes on North Atlantic right whales and other whale species in the region. Ship strikes are considered the main threat to North Atlantic right whales; therefore, NMFS anticipates this regulation will result in population improvements to this critically endangered species.

Energy Projects: Cape Wind Associates proposes to construct a wind farm on Horseshoe Shoal, located between Cape Cod and Nantucket Island in Nantucket Sound, Massachusetts. The Cape Wind Associates project would have 130 wind turbines located as close as 4.1 miles off the shore of Cape Cod in an area of approximately 24 square miles with the turbines being placed at a minimum of 1/3 of a mile apart. The turbines would be interconnected by cables, which would relay the energy to the shore-based power grid. If constructed, the turbines would preempt other bottom uses in an area similar to oil and natural gas leases. The potential impacts associated with the Cape Wind Associates offshore wind energy project include the construction, operation, and removal of turbine platforms and transmission cables; thermal and vibration impacts; and changes to species assemblages within the area from the introduction of vertical structures.

The Bureau of Ocean Energy Management (BOEM) published Notice of Intent to Prepare an Environmental Impact Statement for Potential Commercial Wind Lease Issuance and Approval of Construction and Operations Plan Offshore Maine" was published in the Federal Register on August 10, 2012. Statoil NA's proposed project, Hywind Maine, would consist of four 3- megawatt (MW) floating wind turbine generators (WTGs) configured for a total of 12 MW. The project would be located in water depths greater than 100 meters approximately 12 nautical miles off the coast of Maine. Statoil NA's short-term objective is to construct the Hywind Maine project to demonstrate the commercial potential of the existing floating offshore Hywind technology. The company's long-term objective is to construct a full-scale, deepwater floating wind turbine facility that leverages economies of scale as well as technical and operational enhancements developed in the Hywind Maine project. The full-scale project would be subject to a subsequent and separate leasing and environmental review process.

BOEM also prepared an EA in July of 2013 considering the reasonably foreseeable environmental impacts and socioeconomic effects of issuing renewable energy leases and subsequent site characterization activities (geophysical, geotechnical, archaeological, and biological surveys needed to develop specific project proposals on those leases) in an identified Wind Energy Area on the OCS offshore Rhode Island and Massachusetts. This EA also considers the reasonably foreseeable environmental impacts associated with the approval of site assessment activities (including the installation and operation of meteorological towers and buoys) on the leases that may be issued in the Wind Energy Area.

Other offshore projects that can affect VECs include the construction of offshore liquefied natural gas facilities such as the Neptune liquefied natural gas facility approximately 10 miles off the coast of Gloucester, Massachusetts. The liquefied natural gas facility consists of an unloading buoy system where specially designed vessels moor and offload their natural gas into a pipeline, which delivers the product to customers in Massachusetts and throughout New England. As it related to the impacts of the Proposed Action, the Neptune liquefied natural gas facility is expected to have small, localized impacts where the pipelines and buoy anchors contact the bottom.

On December 1, 2010, the Obama administration announced there would be at least a seven year moratorium on oil and natural gas exploration on the Atlantic coast.

Summary of Impacts: Most of the impacts from these aforementioned activities are uncertain but would likely range from negative to low negative in the immediate areas of the project site. However, on a larger-scale population level, these activities are likely to have a low negative to negligible impact considering that the large portion of the populations have a limited or negligible exposure to these local non-fishing perturbations and that existing regulatory requirements would likely mitigate the severity of many impacts (see Table 88).

5.2.5 Summary of Cumulative Effects

The following analysis summarizes the cumulative effects of past, present, and reasonably foreseeable future actions in combination with the proposed action on the VECs identified in Section 5.1.

5.2.5.1 Physical Environment/Habitat/EFH

While the impact analysis in this action is focused on direct and indirect impacts to the physical environment and EFH, there are a number of non-fishing impacts that must be considered when assessing cumulative impacts. Many of these activities are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. In addition, the operation of vessels in all sectors would have negligible impacts on benthic/demersal habitat, since these vessels, under the No Action Alternative, would be in the common pool and would have fished in the same areas. Other non-fishing factors such as climate change and ocean acidification are also thought to play a role in the degradation of habitat. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. However, impacts from the proposed action were found to be negligible. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action would not result in significant cumulative impacts.

5.2.5.2 Allocated Target Species

As found in the CEA for Amendment 16 to the FMP (NEFMC 2009a), the long-term trend has been positive for cumulative impacts to allocated target species. While several groundfish species remain overfished or overfishing is occurring, substantial effort reductions since implementation of the Northeast Multispecies FMP have allowed several stocks to rebuild and the rebuilding process for others is underway. Further, indirect impacts from the effort reductions in other FMPs are also thought to contribute to groundfish mortality reductions. In addition, the operation of vessels in all sectors would have negligible impacts on allocated target species, due to the imposition of an ACE for each allocated target species. Also, the effects from non-fishing actions are expected to be low negative as the potential for localized harm to VECs exists. These factors, when considered in conjunction with the proposed action which would have negligible impacts to allocated target species due to the implementation of an ACE, would not have any significant cumulative impacts. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action would not result in significant cumulative impacts.

5.2.5.3 Non-allocated Target Species and Bycatch

The primary non-allocated target and bycatch species analyzed for the purposes of this EA are monkfish, spiny dogfish, and skates. The operation of vessels in all sectors would have negligible impacts on non-allocated target species and bycatch, because the catch rate for non-allocated target stocks are likely linked to that of allocated target stocks, the allocations of which are controlled by ACEs. The end result would be little if any increase in impacts to non-allocated target species and bycatch under sector management relative to the common pool. Management efforts in the past have led to each of these species being managed under their own FMP. One of the mandates of FMPs is to minimize bycatch and discard species. Therefore, with continued management actions, FMPs should have a positive impact on bycatch and discard species. The effects from non-fishing actions are expected to be low negative as the potential for localized harm to VECs exists. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action would not result in significant cumulative impacts.

5.2.5.4 Protected Resources

The operation of all sectors may increase the potential for gear interactions with protected species, relative to the vessels operating in the common pool, due to several sector-specific exemptions. This potential increase in gear interaction would likely have low negative impacts on protected resources. Historically, the implementation of FMPs and sectors has resulted in reductions in fishing effort. As a result, past fishery management actions are thought to have had a slightly positive impact on strategies to protect protected species. Gear entanglement continues to be a source of injury or mortality, resulting in some adverse effects on most protected species to varying degrees. One of the goals of future management measures will be to decrease the number of marine mammal interactions with commercial fishing operations. Measures adopted by Amendment 16 and subsequent frameworks to the Northeast Multispecies FMP substantially reduced the overall commercial fishing effort and the amount of groundfish that can be caught.. The cumulative result of these actions to meet mortality objectives are positive for protected resources. The effects from non-fishing actions are also expected to be low negative as the potential for localized harm to VECs exists. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action would not result in significant cumulative impacts.

5.2.5.5 Human Communities and Social and Economic Environment

The operation of vessels in all sectors would have an overall low positive impact on human communities, including ports and sector participants, due to the increase in revenue, which would result from higher ex-vessel values with landings and more fish being landed because of the flexibility that sector management provides. Past management actions have had a negative impact on communities that depend on the groundfish fishery, particularly as a result of decreases in revenue. Although special programs implemented through Amendment 13 and subsequent framework actions have provided the industry additional opportunities to target healthier groundfish stocks, substantial increases in landings and revenue will likely not take place until further stock rebuilding occurs under the Amendment 16 rebuilding plan. The effects from non-fishing actions are also expected to be negligible to low negative as the potential for localized harm to VECs exists. Impacts, both positive and negative, from the Proposed Action would likely due little to change this finding. The combination of the current condition of the VEC combined with these past, present, and reasonably foreseeable future actions when considered with the proposed action would not result in significant cumulative impacts.

Conclusion

In conclusion, the summary of impacts from operations of all sectors and CEA Baseline would be negligible on habitat, allocated target species, and non-allocated target species and bycatch; likely low negative to protected resources; and low positive to human communities (Table 89). These impacts would not be significant due to the reasons stated in this assessment.

Table 89. Cumulative Effects Resulting from Implementation of the Proposed Action and CEA Baseline

		Habitat Impacts	Biological Impacts			Human Community Impacts	
		Habitat	**Allocated Target Species**	**Non-allocated Target Species and Bycatch**	**Endangered/ Protected Species**	**Ports**	**Sector Participants**
Cumulative Effect Baseline	Effects of All Sectors (see Table 86)	Negl	Negl	Negl	Negl	L+	L+
	Effects of Past, Present, and Reasonably Foreseeable Future Non-Fishing Actions (see Table 87)	- to L-	L-	L-	L-	Negl to L-	Negl to L-
	Effects of Past, Present, and Reasonably Foreseeable Future Fishing Actions (see Table 88)	+	+	+	+	-	-
Direct and Indirect Effects of Proposed Sector Operations (see Table 85)		Negl	Negl	Negl	Likely L-	L+	L+
Cumulative Effects Sum of Effects from implementation of Sector operations and Cumulative Effect Baseline		Negl	Negl	Negl	Likely L-	L+	L+

6.0 LIST OF PREPARERS AND POINTS OF CONTACT

The following staff members of the National Marine Fisheries Service (NMFS) Greater Atlantic Regional Fisheries Office and the Northeast Fisheries Science Center collaborated on the preparation of this document:

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7.0 PERSONS AND AGENCIES CONSULTED

Staff members of NMFS Greater Atlantic Regional Fisheries Office and Northeast Fisheries Science Center were also consulted in preparing this EA. No other persons or agencies were consulted.

8.0 COMPLIANCE WITH APPLICABLE LAWS AND EXECUTIVE ORDERS

8.1 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Section 301 of the Magnuson-Stevens Act requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. Changes implemented by Amendment 16 address how the proposed management actions comply with the National Standards. Under Amendment 16, the NEFMC adopted conservation and management measures that would end overfishing and rebuild Northeast Multispecies stocks to achieve, on a continuing basis, the optimum yield for Northeast Multispecies stocks and the U.S. fishing industry using the best scientific information available consistent with National Standards 1 and 2. Under FWs 45, 47, 48, and 50, the NEFMC expanded and revised several measures, including additional conservation measures. The Northeast Multispecies FMP and implementing regulations manage all 20 groundfish stocks (13 species) throughout their entire range, as required by National Standard 3. Section 9.1.1 of Amendment 16 describes how the sector measures implemented under that action do not discriminate among residents of different states consistent with National Standard 4, do not have economic allocation as their sole purpose (National Standard 5), account for variations in these fisheries (National Standard 6), avoid unnecessary duplication (National Standard 7), take into account fishing communities (National Standard 8), addresses bycatch in fisheries (National Standard 9), and promote safety at sea (National Standard 10). By proposing to meet the National Standards requirements of the Magnuson-Stevens Act through future FMP amendments and framework actions, the NEFMC will ensure that overfishing is prevented, overfished stocks are rebuilt, and the maximum benefits possible accrue to the ports and communities that depend on these fisheries and the Nation as a whole.

Annual review of sector operations plans ensures that proposed sector activities are consistent with the rebuilding plan for Northeast Multispecies stocks. The proposed action would comply with all elements of the Magnuson-Stevens Act, including the National Standards, and the Northeast Multispecies FMP. This action is being taken in conformance with the Northeast Multispecies FMP, which requires sector operations plans be analyzed in an appropriate document in compliance with NEPA, Magnuson-Stevens Act, and other applicable laws and Executive Orders. Amendment 13 to the FMP established the sector operations plan approval process. Amendment 16 to the FMP authorized 17 new sectors and revised the regulations governing all sectors. FW 45 to the FMP authorized 5 additional sectors. Nothing in this action changes the findings in Amendment 16 that this action complies with the provisions of the Magnuson-Stevens Act. There are no adverse impacts associated with this action, so no EFH assessment or EFH consultation is required, as determined by a Habitat Conservation Division Review on February 5, 2015.

8.2 ENDANGERED SPECIES ACT (ESA)

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The measures included in implementing FY 2015/16 sector operations plans fall within the scope of consultations on previous NE multispecies fishery actions and are within the range and description of the action previously analyzed during formal section 7 consultation on the NE Multispecies FMP and six other FMPs completed on December 16, 2013. Implementing FY 2015/16 sector operations plans is not expected to significantly change fishing activity under the NE Multispecies FMP. None of the proposed measures are expected to result in changes to, or the addition of, adverse impacts to ESA-listed marine mammals, sea turtles, Atlantic sturgeon, Atlantic salmon that would change the basis for the conclusions of the 2013 Opinion for the NE multispecies and other six Northeast fisheries. Finally, there have been no new species listed under the ESA or critical habitats designated that may be affected by the proposed action, nor has the amount or extent of incidental take exempted in the ITS of the 2013 Opinion been exceeded. Therefore, the proposed measures do not meet the triggers for reinitiation of consultation. For further information on the potential impacts of the fishery and the proposed management action on listed species, see Sections 4.5.4, and 5.2.3.4 of this document.

8.3 MARINE MAMMAL PROTECTION ACT (MMPA)

NMFS has reviewed the impacts of the FY 2015/16 sector operations plans on marine mammals and concluded that the management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management unit of the Northeast Multispecies FMP. For further information on the potential impacts of the proposed management action, see Sections 5.1.3, 5.1.4 and 5.1.5.

8.4 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

To be completed after public comment period.

8.5 ADMINISTRATIVE PROCEDURE ACT (APA)

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 NMFS is planning any abridgement of the rulemaking process for this action.

8.6 PAPERWORK REDUCTION ACT (PRA)

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. PRA for data collections relating to sectors have been considered and evaluated under Amendment 16 to the FMP and approved by the Office of Management and Budget under Office of Management and Budget Control Number 0648-0605. This proposed action relies upon the existing collections, including those approved by the Office of Management and Budget under Amendment 16, and does not propose to modify any existing collections or to add any new collections. Therefore, no review under the PRA is necessary for this action.

8.7 COASTAL ZONE MANAGEMENT ACT (CZMA)

Section 307(c)(1) of the CZMA requires that all Federal activities which affect any coastal use or resource be consistent with approved state coastal zone management programs (CZMP) to the maximum extent practicable. NMFS has reviewed the relevant enforceable policies of each coastal state in the NE region for this action and has determined that this action is incremental and repetitive, without any cumulative effects, and is consistent to the maximum extent practicable with the enforceable policies of the CZMP of the following states: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, and North Carolina. NMFS finds this action to be consistent with the enforceable policies to manage, preserve, and protect the coastal natural resources, including fish and wildlife, and to provide recreational opportunities through public access to waters off the coastal areas. Pursuant to the general consistency determination provision codified at 15 CFR 930.36(c), NMFS sent a general consistency determination applying to the current Northeast Multispecies FMP, and all routine Federal actions carried out in accordance with the FMP, to the following states: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, and North Carolina on October 21, 2009.

8.8 INFORMATION QUALITY ACT (IQA)

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

Utility

This environmental assessment (EA) for the FY 2015/16 operations plans for 17 sectors presents a description of the purpose and need of the proposed action (approval of the sector operations plans), the measures proposed, and the impacts of those measures. A discussion of the reasons for the action is included so that intended users may have a full understanding of the action and its implications. Once a final rule is published, it will be the principal means by which the information pertinent to the proposed operations plan will be made available to the public. The final rule will have specific information on the preliminary number of participants and allocations for each sector. The EA contains the various elements of interest to the public that are necessary for decision makers to make informed decisions based on accurate information. The operations plans are consistent with the NE Multispecies FMP and the conservation and management goals of the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The intended users of the information product are participants of the NE multispecies fishery, industry members and other interested members of the public, members of the New England Fishery Management Council (Council), and the National Marine Fisheries Service (NMFS). The principle elements of the approved sector operations plans for FY 2015/16 are the same as those in effect for the 17 sectors approved to operate in FY 2014, though the sectors have requested a new exemption for fishing years 2015 and 2016. Sectors have added additional provisions governing sector operations, including at-sea monitoring plans and plans to monitor fishing in the inshore portion of the Gulf of Maine Broad Stock Area. The EA is tiered from the environmental impact statement developed for Amendment 16 to the NE Multispecies FMP and incorporates the most recent information available.

The sector operations plans and EA are available in printed format and will be available in PDF format online through www.regulations.gov. The proposed rule (and the final rule), once published in the Federal Register, will be made available as a printed publication, and on the www.regulations.gov website. The Federal Register documents will provide metric conversions for all units of measurement.
Integrity

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of Office of Management and Budget 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 Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity

For the purposes of the Pre-Dissemination Review, this EA 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 EFH Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the NEPA.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee, or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through Vessel Trip Report and Commercial Dealer databases, as well as information collected via surveys conducted by the scientists of the Northeast Fisheries Science Center. 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 EA build upon the analyses contained in the Amendment 16 EIS, and were prepared using data from accepted sources, and the analyses have been reviewed by NOAA.

Despite current data limitations, the measures for this action were selected based upon the best scientific information available. The analyses conducted in support of the action were both quantitative and qualitative, and tier off analyses in the Amendment 16 EIS, which were conducted using information from the most recent complete fishing year at the time they were developed. The data used in the analyses provide the best available information on the state of each species regulated under the FMP (i.e., GARM III, September 2008; and the DPWG 2009), species and EFH data from NOAA, and fishery landings through FY 2011. 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 state of the regulated fisheries under the FMP, fishing techniques in the approved FY 2014 sectors, and the socio-economic impacts of the fisheries on impacted communities.

The policy choices are clearly articulated in Section 3.0 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, or incorporated by reference, in Sections 4.0 and 5.0 of this EA. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this EA involves the Northeast Fisheries Science Center, the Greater Atlantic Regional Fisheries Office, and NMFS 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. 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 in this EA and clearance of any rules prepared to implement resulting regulations is conducted by staff at NMFS Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.9 REGULATORY FLEXIBILITY ACT (RFA)

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration (SBA) that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities.

As outlined in section 2.0, the purpose of this action is the implementation of FY 2015/16 sector operations plans and associated regulatory exemptions. In an effort to rebuild the NE Multispecies complex, other actions have reduced the allocations of several stocks managed by the NE Multispecies FMP. This action is needed to provide flexible fisheries management that alleviates potential social and economic hardships resulting from those reductions. This action seeks to fulfill the purpose and need while meeting the biological objectives of the NE Multispecies FMP, as well as the goals and objectives set forth by the NEFMC in the NE Multispecies FMP.

As of May 1, 2014 (beginning of FY 2014), NMFS had issued limited-access groundfish permits to 1,046 vessels. Ownership data collected from permit holders indicates that there are 868 distinct business entities that hold at least 1 limited-access groundfish permit. Of these, 855 entities are categorized as small and 13 are categorized as large entities per the SBA guidelines. All 855 small entities will be directly regulated by this proposed action.

There are 116 entities that are "groundfish dependent" (greater than 50 percent of gross sales from the sales of regulated groundfish), all of which are commercial finfish harvesting businesses and all of which are small entities. Fourteen (14) of these groundfish-dependent entities operate exclusively in the common pool and are unlikely to join the sector program in FY 2015.

The proposed action, implementing sector operations plans for FY 2015/16, would allow sector participants to use the universal sector exemptions granted under Amendment 16 to the Northeast multispecies FMP. In addition to the universal sector exemptions granted under the approval of individual sector operations plans, sector participants have requested relaxation of 22 other gear, area, administrative, and seasonal restrictions. The proposed action would grant 19 of these exemptions.

The proposed action is expected to have a positive economic impact on small entities. It will further increase the flexibility of fishermen to land their allocation at their discretion; well-accepted economic theory holds that this will result in increased profitability. By choosing when and how to land their allocations, sector participants have the potential to reduce marginal costs, increase revenues, and ultimately increase profitability. Again, it is expected that fishermen will only use sector-specific exemptions that they believe will maximize utility, and that long-term stock impacts from the collective exemptions will be minimal and will be outweighed by benefits from operational flexibility.

The proposed action is not expected to have a significant or substantial impact on small entities. The impacts on the regulated small entities identified in this analysis are expected to be positive relative to the no action alternative, which would revert sector participants back to the common pool. In the common pool, most limited access multispecies permit holders would be subject to days-at-sea (DAS), trip limits, gear restrictions, size limits, and closures intended to control overall fishing mortality. In addition, these effort controls would be subject to in-season modifications based on industry-wide landings. Small entities would not be placed at a competitive disadvantage relative to large entities, and the regulations would not reduce the profit for any small entities. As a result, an initial regulatory flexibility analysis is not required and none has been prepared.

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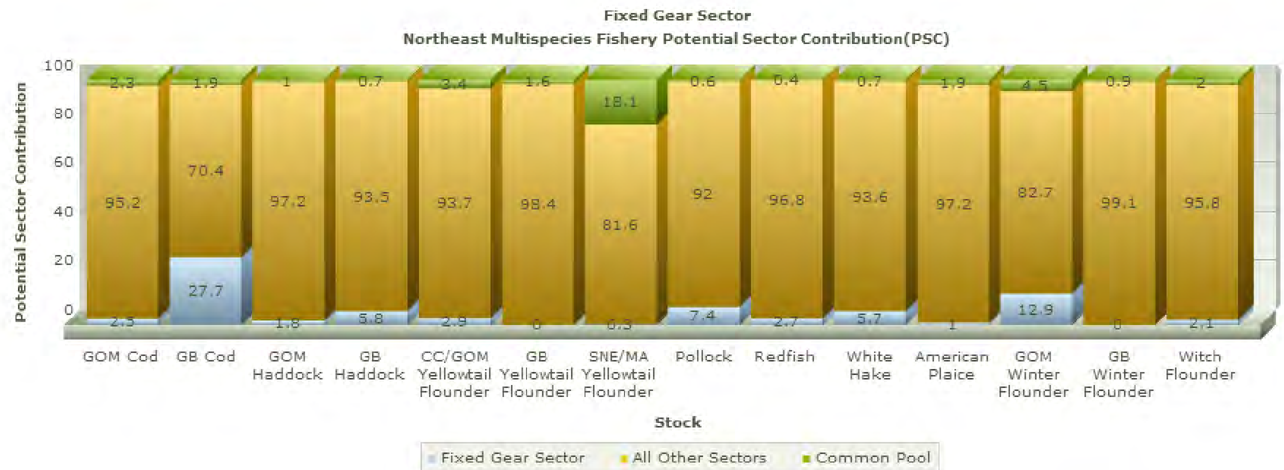
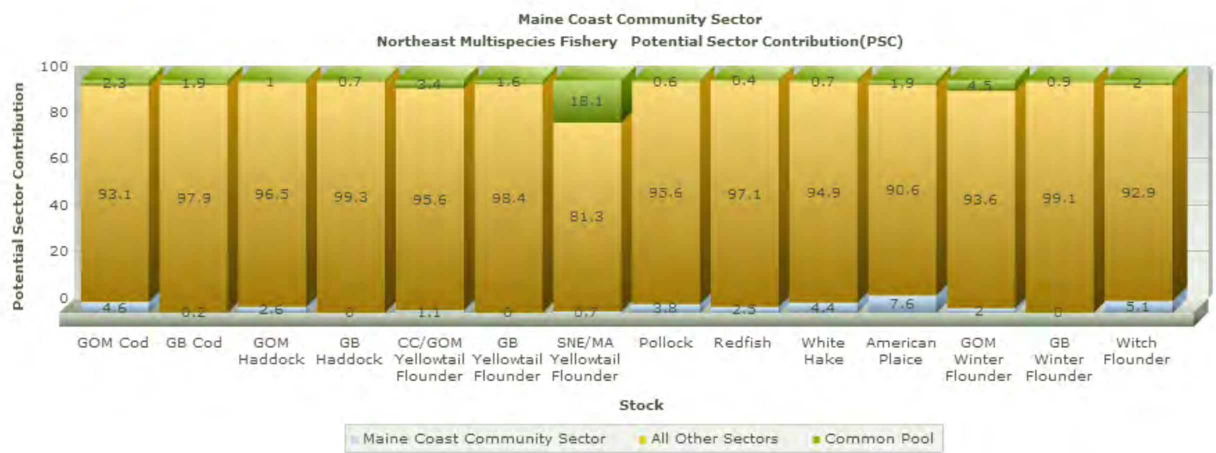
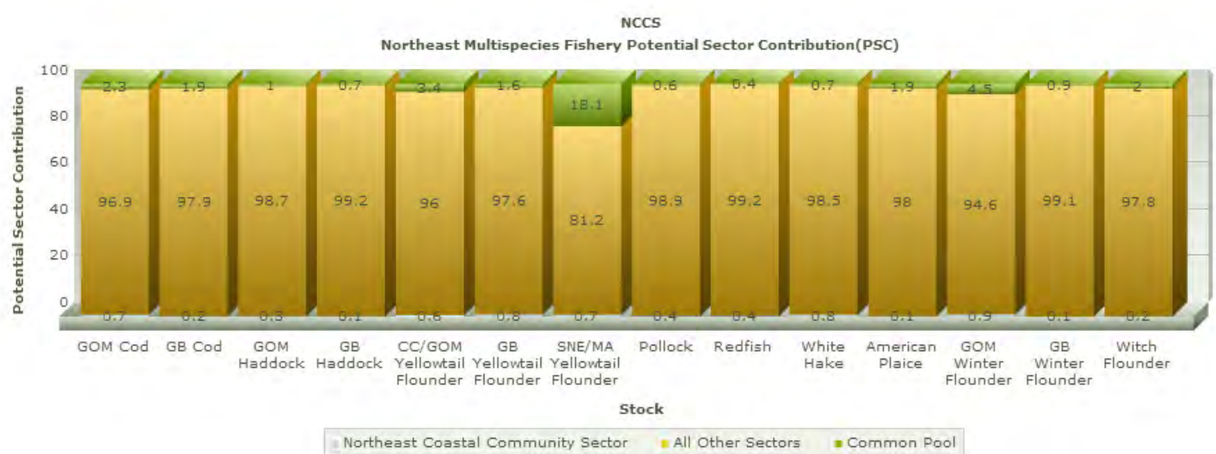
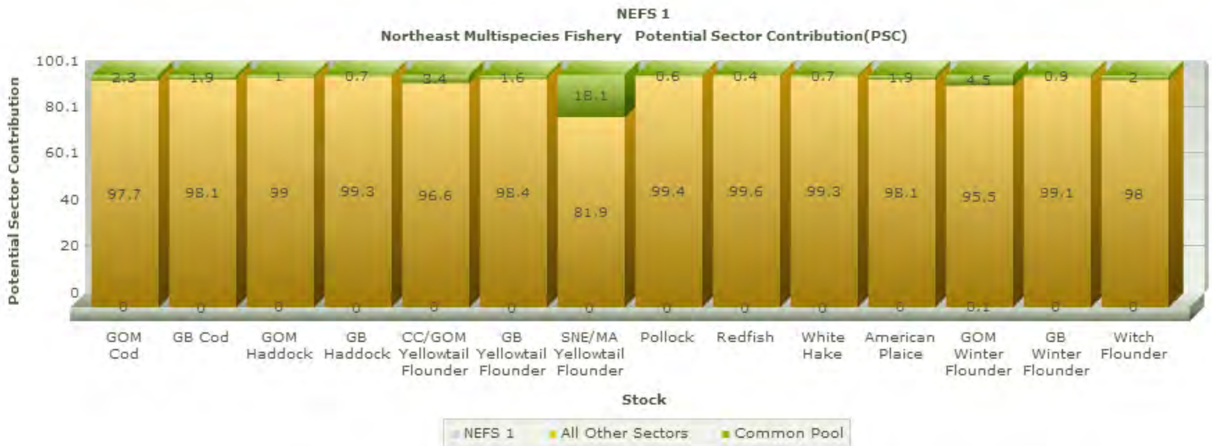
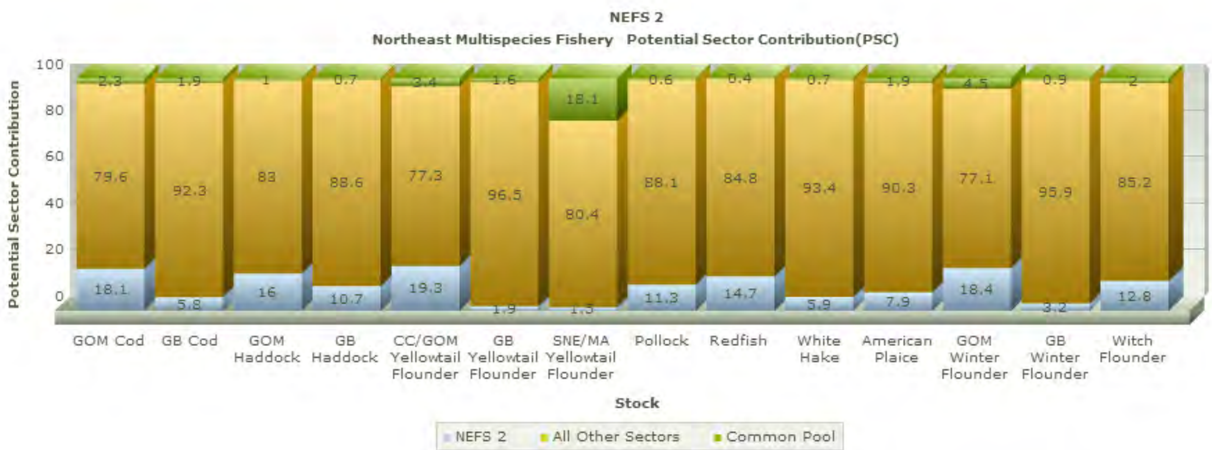
APPENDIX A: FY 2014 SECTOR PSC BY ALLOCATED TARGET STOCK COMPARED TO ALL OTHER SECTORS AND THE COMMON POOL

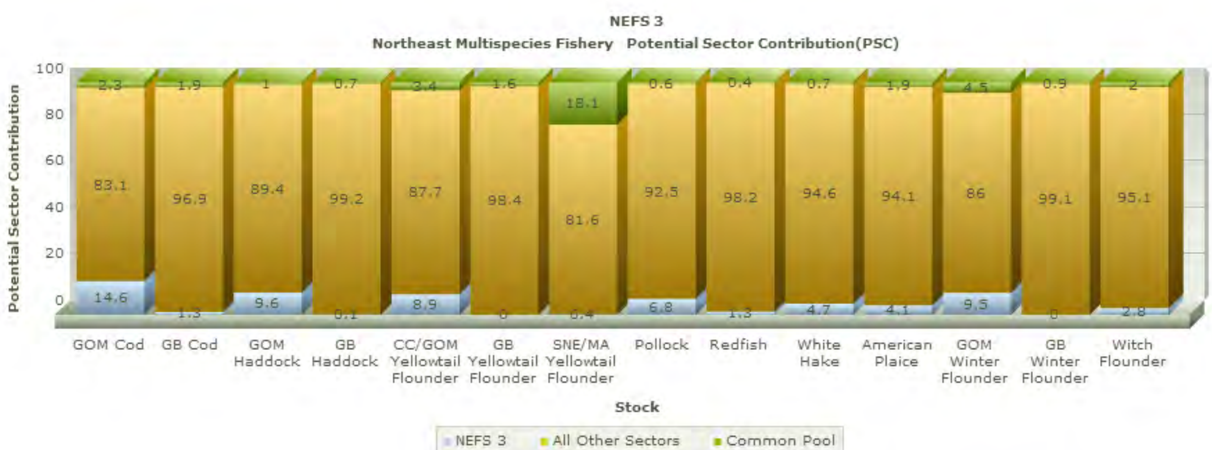


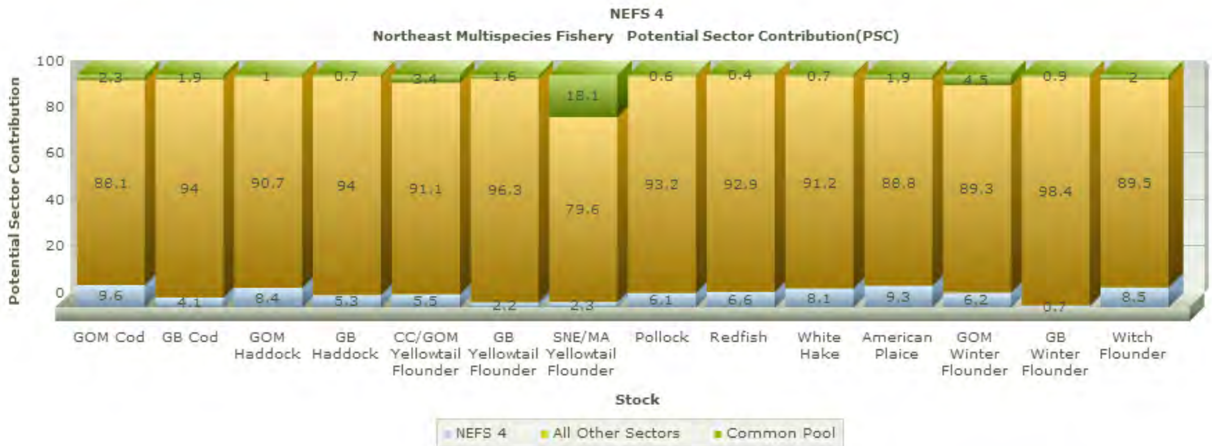


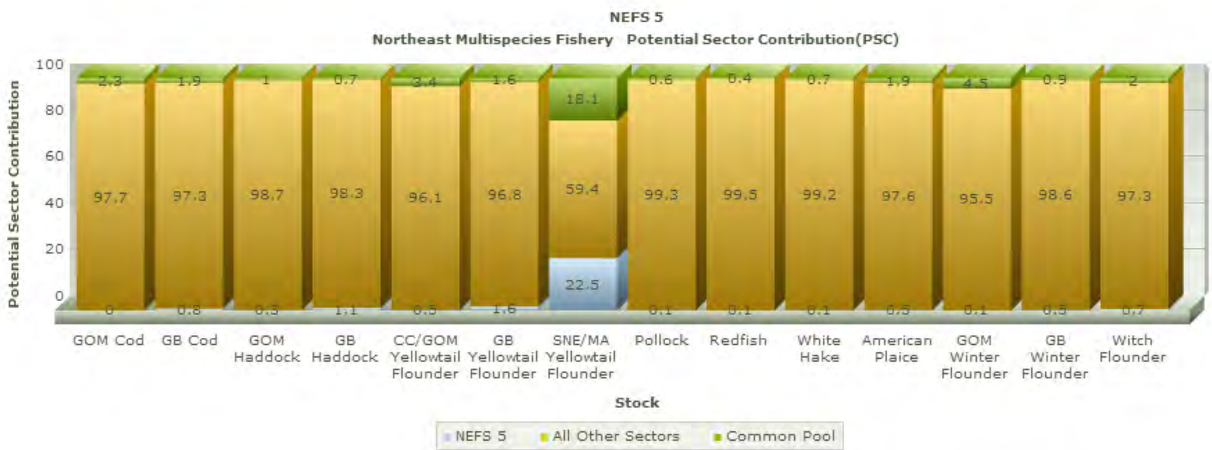


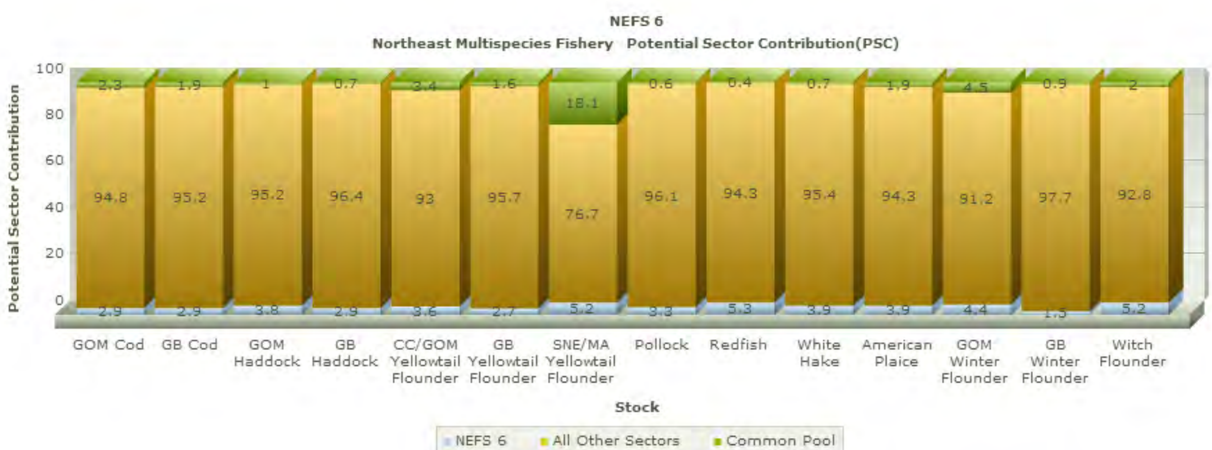

NEFS 1
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
NEFS 1
All Other Sectors
Common Pool

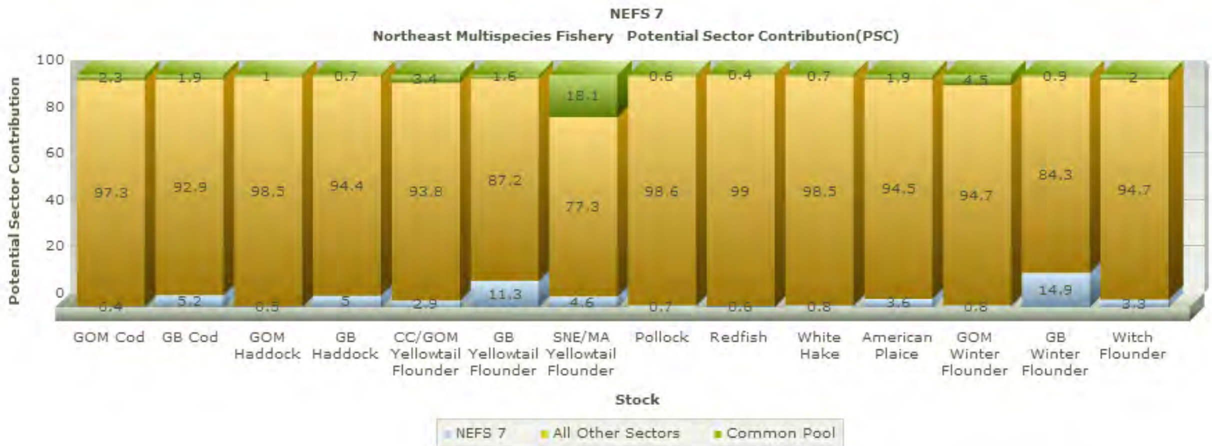

NEFS 2
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
NEFS 2
All Other Sectors
Common Pool

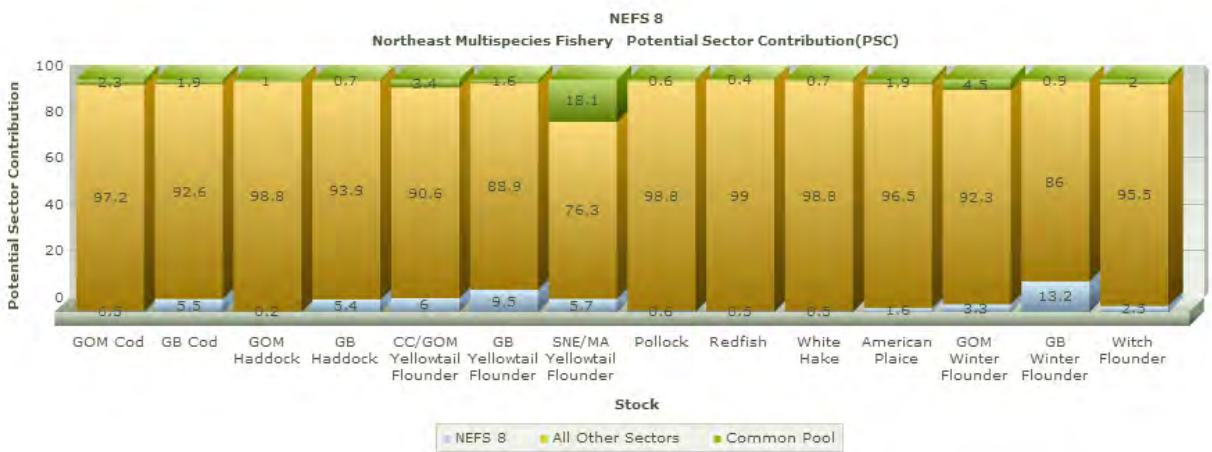

NEFS 3
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
NEFS 3
All Other Sectors
Common Pool

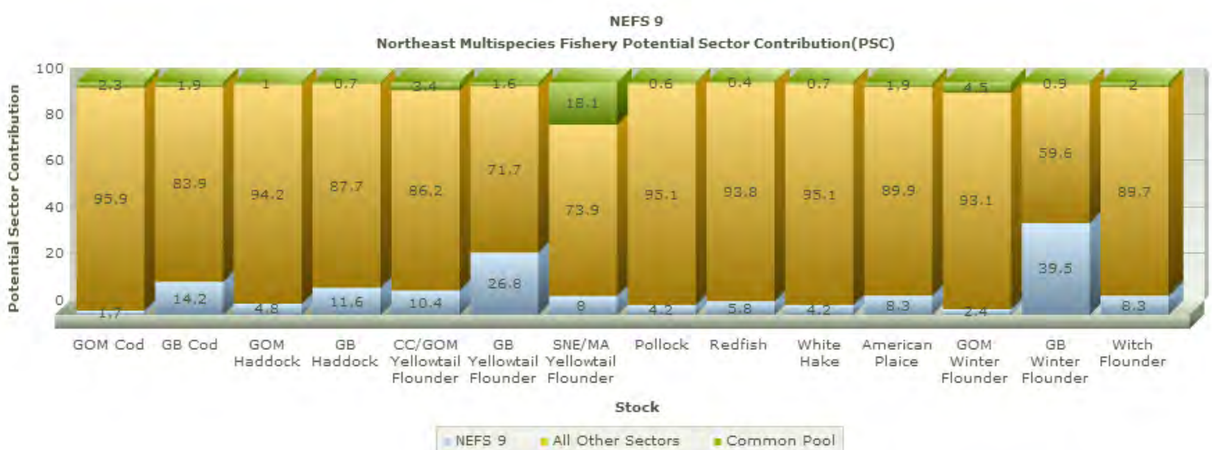

NEFS 4
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
100
80
60
40
20
0
2.3 1.9 1 0.7 3.4 1.6 18.1 0.6 0.4 0.7 1.9 4.5 0.9 2
88.1 94 90.7 94 91.1 96.3 79.6 93.2 92.9 91.2 88.8 89.3 98.4 89.5
9.6 4.1 8.4 5.3 5.5 2.2 2.3 6.1 6.6 8.1 9.3 6.2 0.7 8.5
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Stock
NEFS 4
All Other Sectors
Common Pool

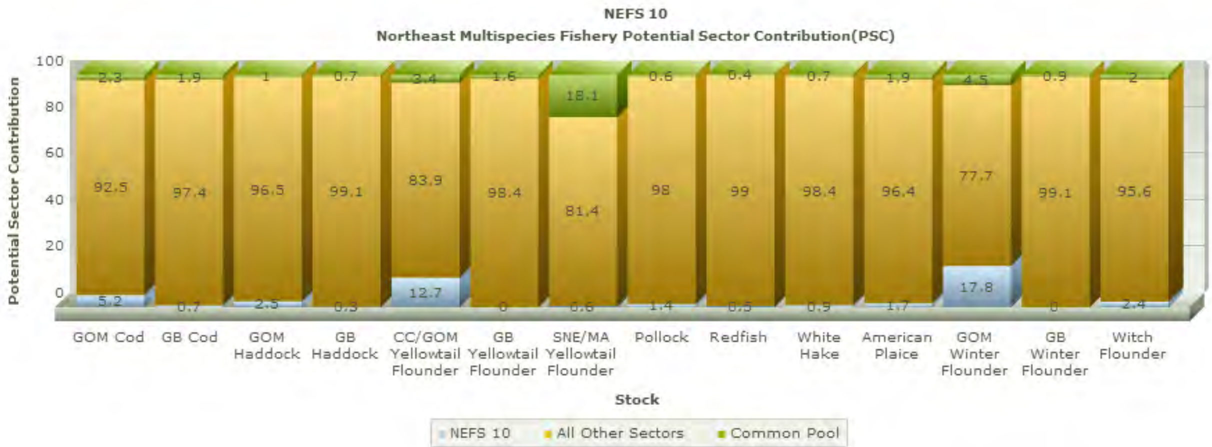

NEFS 5
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
100
80
60
40
20
0
2.3 1.9 1 0.7 3.4 1.6 18.1 0.6 0.4 0.7 1.9 4.5 0.9 2
97.7 97.3 98.7 98.3 96.1 96.8 59.4 99.3 99.5 99.2 97.6 95.5 98.6 97.3
0 0.8 0.3 1.1 0.5 1.6 22.5 0.1 0.1 0.1 0.5 0.1 0.5 0.7
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Stock
NEFS 5
All Other Sectors
Common Pool

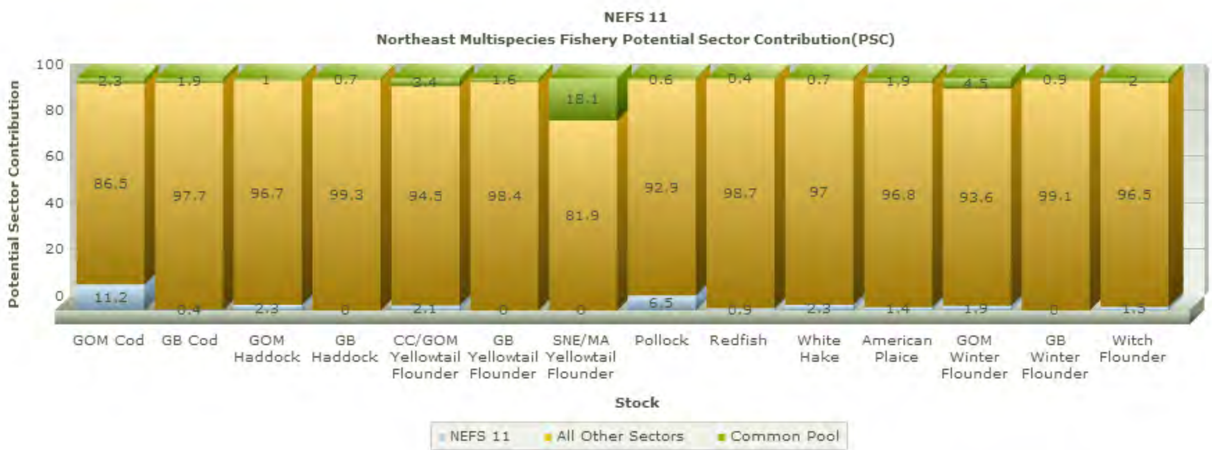

NEFS 6
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
100
80
60
40
20
0
2.3 1.9 1 0.7 3.4 1.6 18.1 0.6 0.4 0.7 1.9 4.5 0.9 2
94.8 95.2 95.2 96.4 93 95.7 76.7 96.1 94.3 95.4 94.3 91.2 97.7 92.8
2.9 2.9 3.8 2.9 3.6 2.7 5.2 3.3 5.3 3.9 3.9 4.4 1.3 5.2
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Stock
NEFS 6
All Other Sectors
Common Pool

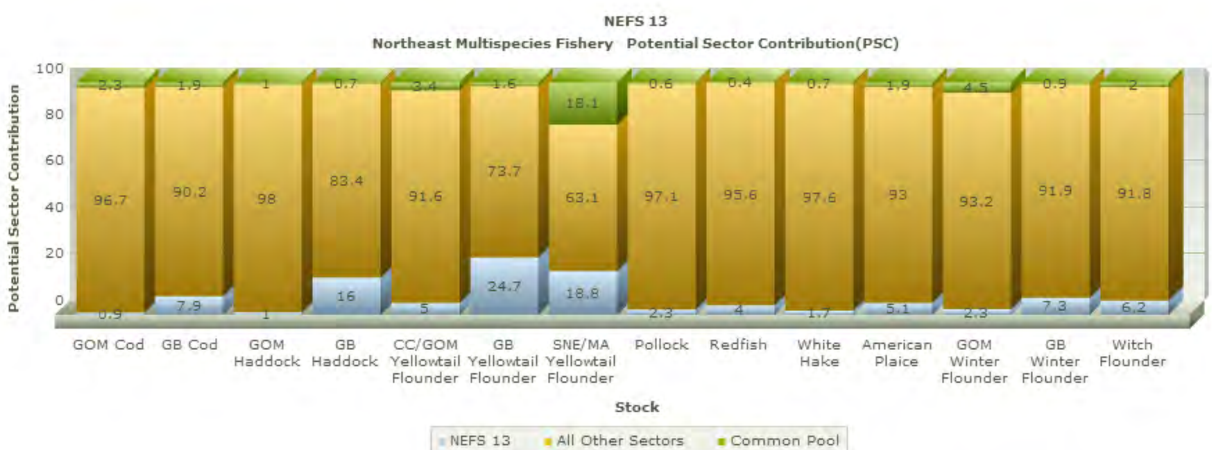

NEFS 7
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
100
80
60
40
20
0
2.3
1.9
1
0.7
3.4
1.6
18.1
0.6
0.4
0.7
1.9
4.5
0.9
2
97.3
92.9
98.5
94.4
93.8
87.2
77.3
98.6
99
98.5
94.5
94.7
84.3
94.7
0.4
5.2
0.5
5
2.9
11.3
4.6
0.7
0.6
0.8
3.6
0.8
14.9
3.3
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Stock
NEFS 7
All Other Sectors
Common Pool

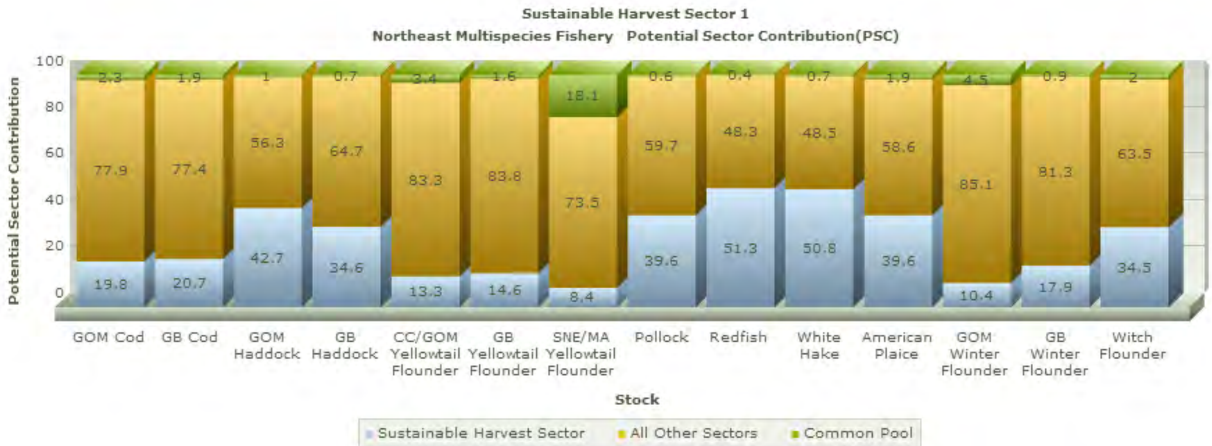

NEFS 8
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
100
80
60
40
20
0
2.3
1.9
1
0.7
3.4
1.6
18.1
0.6
0.4
0.7
1.9
4.5
0.9
2
97.2
92.6
98.8
93.9
90.6
88.9
76.3
98.8
99
98.8
96.5
92.3
86
95.5
0.5
5.5
0.2
5.4
6
9.5
5.7
0.6
0.5
0.5
1.6
3.3
13.2
2.5
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Stock
NEFS 8
All Other Sectors
Common Pool

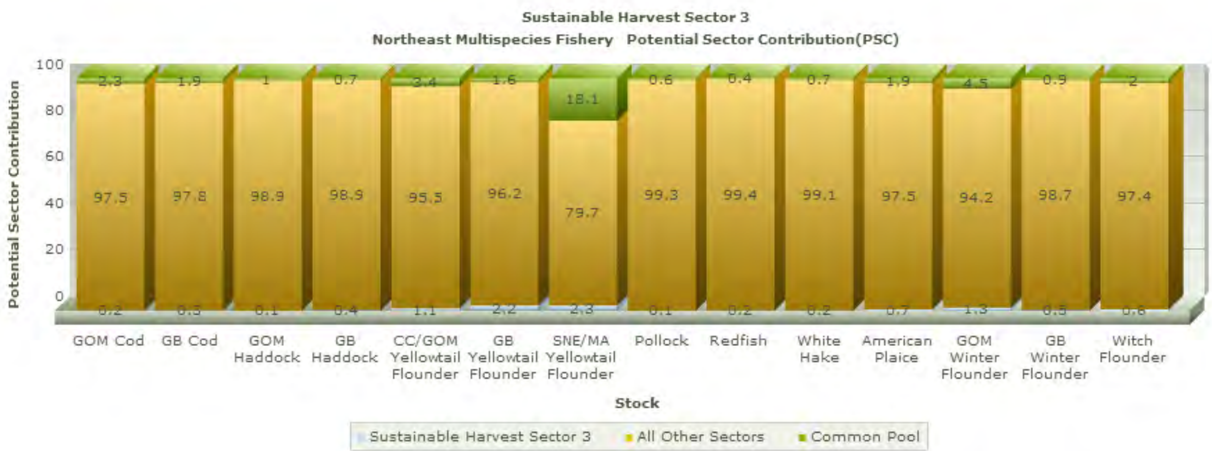

NEFS 9
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
100
80
60
40
20
0
2.3
1.9
1
0.7
3.4
1.6
18.1
0.6
0.4
0.7
1.9
4.5
0.9
2
95.9
83.9
94.2
87.7
86.2
71.7
73.9
95.1
93.8
95.1
89.9
93.1
59.6
89.7
1.7
14.2
4.8
11.6
10.4
26.8
8
4.2
5.8
4.2
8.3
2.4
39.5
8.3
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Stock
NEFS 9
All Other Sectors
Common Pool


NEFS 10
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
NEFS 10
All Other Sectors
Common Pool


NEFS 11
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
NEFS 11
All Other Sectors
Common Pool


NEFS 13
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
NEFS 13
All Other Sectors
Common Pool


Sustainable Harvest Sector 1
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Sustainable Harvest Sector
All Other Sectors
Common Pool


Sustainable Harvest Sector 3
Northeast Multispecies Fishery Potential Sector Contribution(PSC)
Potential Sector Contribution
Stock
GOM Cod
GB Cod
GOM Haddock
GB Haddock
CC/GOM Yellowtail Flounder
GB Yellowtail Flounder
SNE/MA Yellowtail Flounder
Pollock
Redfish
White Hake
American Plaice
GOM Winter Flounder
GB Winter Flounder
Witch Flounder
Sustainable Harvest Sector 3
All Other Sectors
Common Pool