Fishing Year 2013 Northeast Multispecies Sector Operations Plans and Contracts
Additional Exemptions: Year-Round Closed Areas

An Environmental Assessment

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LIST OF ACRONYMS

ABC	Acceptable Biological Catch
ACE	Annual Catch Entitlement
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
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
CAI	Closed Area I
CAII	Closed Area II
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

The National Marine Fisheries Service (NMFS) prepared this analysis to evaluate potential impacts that would result from the approval of additional exemptions for each of the 17 fishing year (FY) 2013 Multispecies sector operations plans and complimentary changes to the American Lobster Fishery Management Plan (FMP).

In accordance with the National Environmental Policy Act (NEPA), this Environmental Assessement (EA) presents impact information on the physical, biological, habitat, and socio-economic ecosystem components that would result in the approval of additional exemptions described herein.

As of May 1, 2013, NMFS has approved a total of 17 sectors to operate according to their sector-specific operations plans under an Annual Catch Entitlement (ACE). A sector is defined as a group of persons holding 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 an ACE in order to achieve objectives consistent with applicable fisheries management plan (FMP) goals and objectives. In the formation of a sector, sector participants can select who could participate (NEFMC 2009). An ACE is defined as the amount of each allocated groundfish stock (in pounds) that a sector can harvest in a fishing year. All other groundfish vessels that are not associated with a sector operate under Common Pool rules, which, among other restrictions, generally control fishing mortality by limiting the number of days-at-sea (DAS).

NMFS prepared one EA to evaluate all FY 2013 sector operations plans. NMFS prepared the EA in accordance with NEPA, and in compliance with NOAA's Administrative Order (NAO) 216-6, and the sector regulations as described in Amendment 16 to the Northeast Multispecies FMP. ACEs and sector operations plans, including any sector-specific exemptions described in subsequent sections, are only valid for the 2013 fishing year (May 1, 2013 to April 30, 2014). For the purpose of analysis in this document, the EA conservatively assumes that 100% of the limited access northeast multispecies permits enroll in sectors for FY 2013. Sections 1.0 through 1.3 of the FY 2013 Sector Operations and Contracts EA contain additional introductory material regarding the multispecies fishery and sectors as a management tool.

The 17 sectors approved to operate in fishing year (FY) 2013 are:

- Northeast Fishery Sector (NEFS) II
- Northeast Fishery Sector III
- Northeast Fishery Sector IV
- Northeast Fishery Sector V
- Northeast Fishery Sector VI
- Northeast Fishery Sector VII
- Northeast Fishery Sector VIII
- Northeast Fishery Sector IX
- Northeast Fishery Sector X
- Northeast Fishery Sector XI
- Northeast Fishery Sector XII
- Northeast Fishery Sector XIII
- Georges Bank Cod Fixed Gear Sector (FGS)
- Sustainable Harvest Sector 1 (SHS 1)
- Sustainable Harvest Sector 3 (SHS 3)
- Maine Coast Sector (MCS)
- Northeast Coastal Communities Sector (NCCS)

The Multispecies FMP currently prohibits sectors from requesting exemptions from year-round groundfish mortality closed areas (CA), permitting restrictions, gear restrictions designed to minimize habitat impacts, and reporting requirements (excluding DAS reporting requirements or DSM requirements).

To increase operational flexibility for vessels participating in sectors as mitigation for reduced ACLs, Multispecies Framework (FW) 48 (78 FR 26172, effective on May 1, 2013), allowed sectors to request access to portions of the CAs that are outside the essential fish habitat closed areas.

Specifically, sectors could request exemptions from the CAs, except for where they overlap current or proposed habitat closed areas. These habitat areas are defined as the existing habitat closed areas specified at § 648.81(h) and the Fippennies Ledge area under consideration as a potential habitat management area in the Omnibus EFH Amendment currently under development by the Council. This limitation would maintain the purpose of existing habitat areas to minimize the adverse effects of fishing on EFH, and preserve the consideration of additional habitat areas, until such time as the Council may choose to modify them through implementation of the Omnibus EFH Amendment. Sectors also would not be exempt from the Western Gulf of Maine (GOM) Closed Area, where it overlaps with a GOM Rolling Closure Area in effect. At this time, the GOM Rolling Closure Area III overlaps the northeast corner of the Western GOM Closed Area, so sectors would not be allowed to request access to this portion of the Western GOM Closed Area during May. Framework 48 further limits Closed Area I (CA I) and Closed Area II (CA II) sector exemption requests to February 16th through April 30th to protect spawning groundfish. This measure was included in FW 48 to help mitigate the reductions in FY 2013 catch limits by allowing sectors to potentially increase access to healthy groundfish stocks such as GB haddock, pollock, and redfish that may be more abundant in these areas.

In anticipation of this change being approved in FW48 for FY 2013, sectors submitted requests for exemptions from portions of the groundfish mortality closures in their FY 2013 operations plans this fall. Sectors requested exemptions for access to the following five year round CAs: Year-round access to the Cashes Ledge Closure Area; year- round access to CA I; year-round access to CA II; year-round acces to the Western GOM Closure Area; and year-round access to the Nantucket Lightship Closed Area (NLCA).

Including these five exemption requests in the rulemaking for the original FY 2013 sector operations plan action could have delayed the approval of the plans and allocations beyond the start of the FY 2013 fishing year (May 1, 2013). This was due to the need for additional time to request and compile data to adequately analyze these new exemptions. Therefore, NMFS is considering sector requests for exemptions from closed areas in this separate analysis and rulemaking.

1.1 SECTOR EXEMPTIONS

Sectors vessels are approved to operate under certain exemptions from Northeast Multispecies regulations under which non-sector vessels (i.e., the "Common Pool") are required to operate. Amendment 16 granted "Universal exemptions" to sector vessels. Sectors request any additional "sector-specific" exemptions in their operations plans. NMFS analyzed the impacts associated with sector vessels operating under these sector-specific exemptions in the FY 2013 Sector Operations and Contracts EA..

1.1.1 Universal Exemptions

Amendment 16 Final EIS to the Northeast Multispecies FMP (NEFMC 2009) analyzed the following universal exemptions for sectors and the general effects of sector formation given these universal exemptions.

- Exemption from groundfish DAS requirements including DAS reductions, differential groundfish DAS counting, the 3/15 rule for gillnets, and 24-hour DAS counting.
- Exemption from trip limits on stocks for which a sector receives an allocation of, except for the following:
    1. Halibut: trip limit would continue to be one fish per trip;

2. No vessel, whether in the Common Pool or in any sector, would be allowed to possess any windowpane flounder (both stocks), ocean pout, wolffish, or SNE/MA winter flounder on board at any time. When caught, these species must be returned.

- Exemption from the Georges Bank Seasonal Closure in May.
- Exemption from any additional mortality controls adopted by Amendment 16, including additional seasonal or year-round closures[1], gear requirements, DAS reductions, differential DAS counting, and/or restricted gear areas.
- Gulf of Maine Rolling Closures in specific blocks as identified in Amendment 16 (specifically Section 4.2.3.9).[2]
- Exemption from the requirement to use 6.5-inch mesh in the cod-end in haddock separator trawl/ Ruhle trawl when targeting haddock in the Georges Bank Regulated Mesh Area (i.e., authorized to use 6-inch mesh in the cod-end).

The final rule for Amendment 16 published April 9, 2010 (75 FR 18262), reduced the requirement for 72-hour pre-trip notification to 48 hour observer notification for all groundfish vessels. A minimum of 48-hour notification is necessary because of the additional logistical demands imposed upon the NMFS Observer Program due to the projected increase in demand for at-sea monitoring.

1.1.2 Sector-Specific Exemptions

In addition to the universal exemptions approved in Amendment 16, several sectors requested to operate under one or more additional exemptions from the NE multispecies regulations as specified in their sector operations plans.

NMFS approved the following exemptions for use in FY 2013. Complete exemptions descriptions and associated restrictions are available in the final rule implementing the FY 2013 Sector Operations and Contracts (78 FR 25591, May 2, 2013).

Table 1. FY 2013 Sector Exemptions

The 120-day gillnet block out of the fishery	A gillnet vessel granted this exemption is not required to declare and take 120 days out of the gillnet fishery in 2013.
The 20-day spawning block	A vessel granted this exemption is not required to stop fishing for groundfish for a 20-day period between March 1 and May 31 of 2013.
The prohibition on hauling another vessel's gillnet gear	This exemption allows multiple vessels participating in the same sector to haul each other's gillnet gear. Each vessel using this exemption must tag each gillnet it intends to haul with one tag.
The number of gillnets that may be hauled on GB when fishing on a groundfish/monkfish DAS	This exemption allows a vessel issued both a groundfish permit and a monkfish permit to haul all of their gillnets on a single GB trip.
The number of hooks that may be fished	A vessel granted this exemption has no limit on the number of hooks they may fish within any of the Regulated Mesh Areas.
The DAS Leasing Program length and horsepower restrictions	Any sector vessel granted this exemption may lease DAS to any other sector vessel also granted this exemption, regardless of a vessel's leasing length and horsepower baseline restrictions.

[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.

[2] Amendment 16 exempts sectors 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.

The prohibition on discarding	A vessel granted this exemption must discard all legal-sized unmarketable fish at sea (not on selected trips), and cannot land unmarketable fish.
Daily catch reporting by sector managers for sectors vessels fishing in the Closed Area (CA) I Hook Gear Haddock Special Access Program (SAP)	This exemption is specific to sector managers, and not to sector vessels. A sector vessel fishing in the CA I Hook Gear Haddock SAP must complete a daily vessel monitoring system (VMS) catch report and submit it directly to us.
Powering a VMS while at the dock	This exemption allows a sector vessel to power down its VMS unit at the dock, after sending a power-down code to us. A vessel with multiple permits requiring VMS (i.e., monkfish, scallop, etc.) must continue to comply with reporting requirements for other fisheries, and may not be able to take advantage of this exemption.
Prohibition on fishing inside and outside the CA I Hook Gear Haddock SAP while on the same trip	A vessel may fish both inside and outside the CA I Hook Gear Haddock SAP on the same trip, but is prohibited from setting or hauling fixed gear across the border of the SAP. The vessel will be required to report via VMS catch from inside the SAP daily either to the sector manager or to us if the sector manager is also exempt from daily reporting requirements for the CA I Hook Gear Haddock SAP. Vessels declared into the CA I Hook Gear Haddock SAP may possess only demersal longline gear or tub trawl gear on the vessel during the trip.
The 6.5-inch minimum mesh size requirement on targeted redfish trips	This exemption allows a vessel to use codends with mesh size as small as 4.5 inches to target redfish, provided an industry-funded monitor is onboard. Sectors wishing to use this exemption must develop an industry-funded monitoring program. NMFS will monitor monthly catch thresholds of 80-percent redfish and a 5-percent groundfish discard limit.
The prohibition on a vessel hauling another vessel's hook gear	This exemption allows multiple vessels participating in the same sector to haul each other's hook gear. Each vessel intending to haul the hook gear must tag the gear consistent with §§ 648.14(k)(6)(ii)(B) and 648.84(a).
The requirement to declare intent to fish in the Eastern U.S./Canada SAP and the CA II Yellowtail flounder/Haddock SAP	This exemption allows a sector vessel to declare its intent to fish in these SAPs while at sea using VMS.
The limits on the number of gillnets for Day gillnet vessels*	A sector Day gillnet vessel is allowed to fish up to a maximum of 150 nets (any combination of flatfish or roundfish nets), except in: May: Blocks 124 and 125 June: Blocks 132 and 133 Vessels granted this exemption must tag each gillnet with one gillnet tag.
Gear requirements in the U.S./Canada Management Area	This exemption allows for the use of any trawl gear in the U.S./Canada Management Area.
Seasonal restrictions for the Eastern U.S./Canada Haddock SAP	This exemption allows a sector vessel to access the Eastern U.S./Canada Haddock SAP from May 1 to December 31 with any gear approved for use in the Eastern U.S./Canada Area, including the standard otter trawl.
Seasonal restrictions for the CA II Yellowtail Flounder/Haddock SAP	This exemption allows a sector vessel to access the CA II Yellowtail Flounder/Haddock SAP from May 1 to January 31 when using selective gear approved for use in the SAP, or the standard otter trawl.
Sampling Exemption	A vessel participating in a sector granted this exemption may temporarily retain fish for sampling purposes.

*Please note that this exemption has been modified from previous years.

1.2 HISTORY OF CLOSED AREAS IN THE NORTHEAST MULTISPECIES FISHERY

Closed areas in the multispecies fishery have been used by managers to reduce fishing mortality and protect spawning groundfish stocks. Table 2 gives a brief history of goundfish year-round closures.

Table 2. Abbreviated History of Groundfish Year Round Closures

Year	Area	Comments
1969	Closed Areas I and II	Established by International Commission for the Northwest Atlantic (ICNAF) to protect spawning ICNAF only allowed closures for spawning protection)
1977	Closed Areas I and II	Incorporated into Atlantic Demersal Finfish Plan *to provide haddock spawning protection*, but recognizing some protection given to cod and yellowtail flounder. Seasonal.
1982	Closed Areas I and II	Incorporated into Interim Groundfish Plan *to protect haddock spawning*. Some changes made to area boundaries. Seasonal.
1986	Closed Areas I and II, Southern New England Yellowtail Flounder closure	CA I and II incorporated into Northeast Multispecies FMP *to protect haddock spawning*. SNE Yellowtail Flounder closure (west of current Nantucket Lightship Closure) adopted *to reduce mortality and enhance spawning potential. Seasonal*.
1988	Closed Areas I and II, Southern New England Yellowtail Flounder closure	Council's Technical Monitoring Group provides evaluation of closures. Recommends moving CAI south and east. Concluded SNE closure was too short in duration, or in the wrong season. (Boundaries of CA I were changed, apparently in response to this suggestion, but not sure when that occurred).
1994	Closed Areas I and II, Nantucket Lightship Closure	Amendment 5 suspends Closed Area I, expands Closed Area II. Nantucket Lightship Closure defined, *closure to take effect when juvenile flounder are found at a defined level in the spring bottom trawl survey*.
1994	Closed Areas I and II	At the request of the Council, NMFS implements expansion of CA II, suspends opening of CA I through an emergency rule *to protect cod and haddock stocks*.
1994	Closed Areas I and II, Nantucket Lightship Closed Area	NMFS implements closures year round through emergency action to reduce mortality.
1995	Closed Areas I and II, Nantucket Lightship Closed Area	Framework 9 adopts year round basis of closures previously implemented through emergency action.
1998	Western Gulf of Maine Closure	Framework 25 adopted WGOM closure *to reduce mortality of Gulf of Maine cod.*
2002	Cashes Ledge Closure Area	NMFS implements year round groundfish closure area per court order
2012 to present	All Groundfish Closure Areas	EFH Ominbus Amendment in development. Closed Area Technical Team (CATT) conviened. Possible modifications to existing habitat and groundfish mortaility closure areas

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of this action is to provide increased access in FY 2013 to the year-round mortality closure areas through regulatory exemptions associated with sector FY 2013 operations plans. 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 additional flexible fisheries management that alleviates potential social and economic hardships resulting from those reductions. This action seeks to maximize the harvest of healthy stocks without compromising 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. This includes ensuring that additional opportunity provided by closed area access would not jeopardize stock rebuilding or ongoing habitat omnibus amendment efforts.

3.0 PROPOSED ACTION AND ALTERNATIVES

The following sections describe the proposed action and other alternatives considered in this assessment. For the purposes of this EA, NMFS analyzed the impacts of the exemptions for approval to all sectors. However, NMFS would independently approve or disapprove each exemption for sectors in the final rule. If approved, these exemptions would only apply to FY 2013 sectors which request them. Table 3 summarizes which sectors have requested these exemptions.

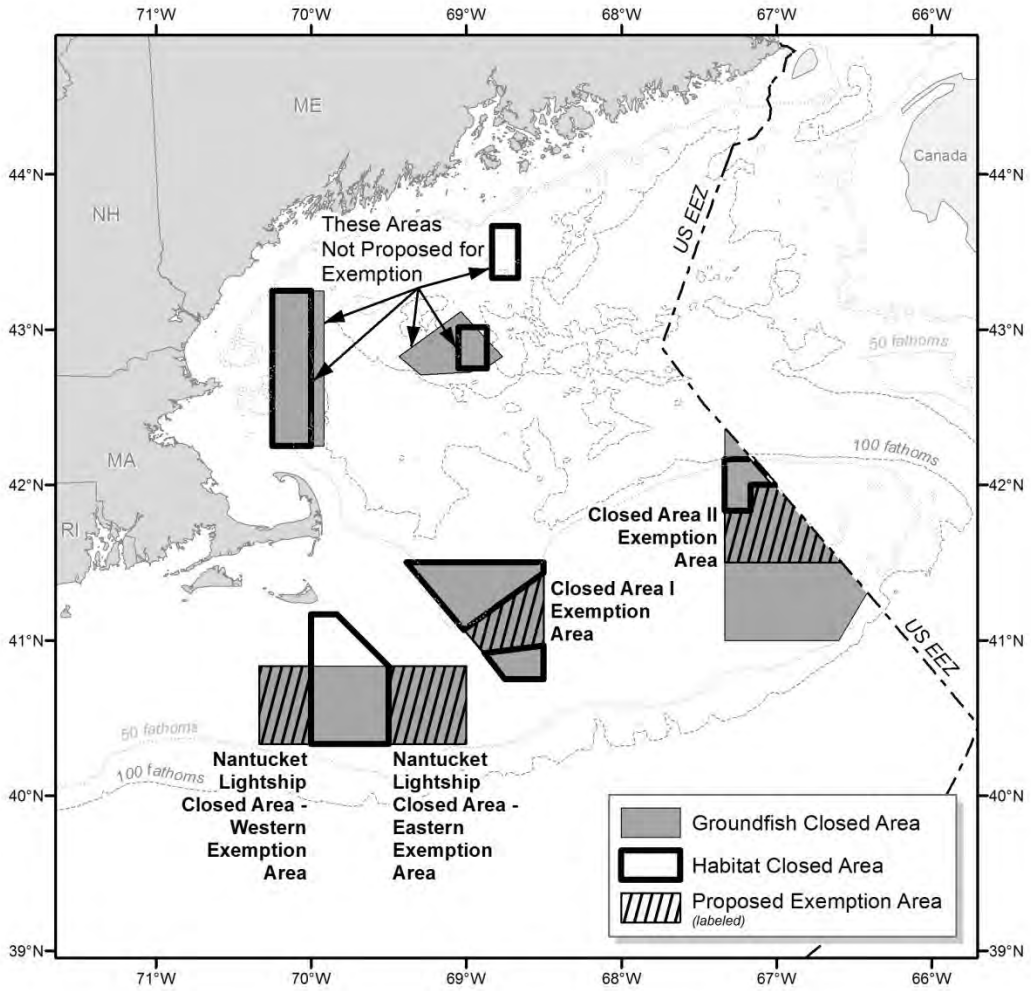
If approved, this measure would allow sector vessels to fish in portions of the Nantucket Lightship Closed Area, Closed Area I, and Closed Area II. The Regional Administrator may include stipulations and constraints on specific exemptions to facilitate the monitoring and enforcement of sector operations or as mitigation measures to address specific potential impacts. Access will only be granted for the parts of the year-round closed areas that are not defined as habitat closed areas. Additional restrictions that apply to specific closed area exemptions are explained below.

Sector vessels must request this exemption so that member vessels can fish in year-round closed areas. Also, sector vessels must carry on board a valid letter of authorization that includes an exemption granting access to year-round closed areas.

Aside from the proposed NLCA standard monitoring coverage exemptions, sectors with vessels that intend to fish in year-round closed areas must have a NMFS-approved industry-funded at-sea monitoring program, and vessels that fish in a year-round closed area would be required to have an industry-funded at-sea monitor on board on 100 percent of trips.

While these proposals are different than what was proposed in Framework 48, additional gear and seasonality restrictions are proposed to reduce potential impacts on spawning Georges Bank cod and yellowtail flounder as well as potential interactions with harbor porpoise and Atlantic sturgeon. It is also possible that other non-groundfish stocks may be caught on groundfish fishing trips into the areas. These catches could also help mitigate the low FY 2013 ACLS for several stocks.

Figure 1. Map of Proposed Exemption Areas



Area	Square miles	Square km	% of total groundfish closures (total area that is covered by either a Groundfish Closed Area, a Habitat Closed Area, or both; 8,920 sq mi or 2,3104 sq km)
Closed Area I Exemption Area	550	1,426	6%
Closed Area II Central Area	863	2,236	10%
Eastern Nantucket Lightship Closed Area	907	2,350	10%
Western Nantucket Lightship Closed Area	605	1,567	7%
Total	2,925	7,579	33%

3.1 ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA

If approved, these measures would allow sector vessels access to a portion of Closed Area I from June 1 through December 31, 2013. 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 gear authorized by the Council in a management action, or approved for use consistent with the process defined in § 648.85(b)(6). Hook vessels would be permitted in this area as well. Gillnet vessels would be prohibited from fishing in Closed Area I.

Closed Area I Exemption Area

POINT	LATITUDE	LONGITUDE
A	41°04'N	69°01'W
B	41°26'N	68°30'W
C	40°58'N	68°30'W
D	40°55'N	68°53'W
A	41°04'N	69°01'W

3.2 ACCESS TO CENTRAL PORTION OF CLOSED AREA II YEAR ROUND CLOSED AREA

If approved, the area between 41° 30'N and the Closed Area II Habitat Closure Area of Closed Area II would be open to selective gear during various portions of fishing year 2013 until December 31, 2013. Trawl vessels would be restricted to selective trawl gear. Approved gears include the separator trawl, the Ruhle trawl, the mini-Ruhle trawl, rope trawl, and any other gear authorized by the Council in a management action, or approved for use consistent with the process defined in § 648.85(b)(6). Hook vessels would be permitted in this area when specified (see below), however gillnet vessels would be prohibited from fishing in Closed Area II.

An agreement (see Appendix A) between the offshore lobster industry and sector trawl vessels proposed a rotational gear-use agreement for the central portion of Closed Area II. However, because of concerns that fishing in Closed Area II could have on spawning Georges Bank cod and concentrations of Georges Bank yellowtail flounder, both of which are considered overfished and subject to overfishing, the following seasons and gear requirements are proposed:

June 16 – October 31	Sector trawl vessels would be prohibited, lobster and sector hook gear vessels only
November 1 – December 31	Only sector trawl vessels could access the area, lobster and fixed gear vessels prohibited
January 1, 2014 – April 30, 2014	Only lobster vessels permitted, sector groundfish vessels would be prohibited in CA II.

The gears and seasons listed above match the agreement between the offshore lobster industry and sector trawl vessels, with the exception that groundfish vessels would be prohibited from fishing in Closed Area II after December 31. Further, as a complimentary part of this alternative/exemption the lobster regulations at section 50 CFR 697.7 would be modified to prohibit lobster vessels from accessing this area. The lobster regulation modifications include prohibiting lobster vessels in the area from May 1 to June 15. However, since this action was not available for implementation by May 1, 2013, this exemption for FY 2013 does not include this time period. The lobster regultations are only applicable if the above sector exemption request is approved. Therefore, a future sector exemption request in FY 2014 could extend the lobster regulation changes into FY 2014.

Closed Area II Central Area

POINT	LATITUDE	LONGITUDE
A	41°50'N	67°20'W
B	41°50'N	67°10'W
C	42°00'N	67°10'W
D	42°00'N	[1] (67°00.5'W)
E[2]	41°30'N	[1] (66°34.8'W)
F	41°30'N	67°20'W
A	41°50'N	67°20'W

[1] The U.S.-Canada Maritime Boundary, approximate longitude in parentheses.
[2] Points D and E are connected along the U.S.-Canada maritime boundary.

3.3 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

If approved, this measure would allow sector vessels to access portions of the Nantucket Lightship Closed area between 70° 00'W and 70° 20'W until April 30, 2014. 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 gear authorized by the Council in a management action. Flounder nets would be prohibited. Hook vessels would be permitted in this area. Gillnet vessels would be restricted to fishing 10-inch (25.4-cm) diamond mesh or larger. Gillnet vessels would be required to use pingers when fishing in the Nantucket Lightship Closed Area – Western Exemption Area from December 1 – May 31, because this area lies within the existing Southern New England Management Area of the Harbor Porpoise Take Reduction Plan.

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

3.4 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

If approved, this measure would allow sector vessels to access portions of the Nantucket Lightship Closed Area between 69° 30'W and 69° 00'W until April 30, 2014. 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 gear authorized by the Council in a management action. Flounder nets would be prohibited. Hook vessels would be permitted in this area. Gillnet vessels would be restricted to fishing 10-inch (25.4-cm) diamond mesh or larger. Gillnet vessels would not be required to use pingers when fishing in the Nantucket Lightship Closed Area – Eastern Exemption Area.

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

This measure would allow sector vessels to obtain greater access to portions of the year-round closed areas. Access to habitat closed areas would not be allowed to avoid adverse affects. The increased access to portions of Closed Areas I and II will facilitate access to groundfish stocks such as Georges Bank haddock, and pollock, in order that more of the ACLs of those underfished stocks can be harvested. Access to portions of Nantucket Lightship Closed Area would allow sector vessels to target monkfish and skates.

3.5 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD MONITORING COVERAGE

This standard monitoring coverage alternative was created as a result of the information received during the public comment period on the EA and proposed rule. It was determined that an alternative that did not require 100 percent monitoring coverage should be analyzed in this EA and proposed for implementation. The rationale for this new alternative is given below, and in the impacts section.

This alternative would provide identical access in the Eastern Area as proposed for the Western portion of the Nantucket Lightship Closed Area as described in Section 3.3.

This alternative would impose no additional industry funded at-sea monitoring coverage for sector vessels fishing in the Western Nantucket Lightship Closed Area. However, like the alternative requiring 100 percent at-sea monitoring coverage, 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.

3.6 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD MONITORING COVERAGE

This standard monitoring coverage alternative was created as a result of the information received during the public comment period on the EA and proposed rule. It was determined that an alternative that did not require 100 percent monitoring coverage should be analyzed in this EA and proposed for implementation. The rationale for this new alternative is given below, and in the impacts section.

This alternative would provide identical access as what is proposed with the Western portion of the Nantucket Lightship Closed Area as described in Section 3.4.

This alternative would impose no additional industry funded at-sea monitoring coverage for sector vessels fishing in the Eastern Nantucket Lightship Closed Area. However, like the alternative requiring 100 percent at-sea monitoring coverage, 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.

Rationale for standard monitoring coverage NLCA alternatives:
These measures would allow sector vessels to obtain greater access to portions of the year-round closed areas without the required monitoring expenses as proposed in the other alternatives. There are several reasons why NLCA could be accessed with less monitoring coverage. First, there are no overfished stocks or stocks subject to overfishing within these areas. Unlike Closed Areas I and II, Georges Bank cod is not common to the area, and there are no Georges Bank yellowtail flounder in the area. There are SNE/MA yellowtail flounder in the area, which are considered rebuilt. However, due to some uncertainty in the stock assessment, selective gear is required in the area to prevent vessels from targeting flatfish. Second, the proposed areas are either within or border several large mesh exempted fishery areas, which when fished with certain gear, are exempt from monitoring coverage. For example, the western portion of Nantucket Lightship Closed Area is located entirely within the Southern New England Monkfish, Skate, and Dogfish Exemption Area. Currently, vessels can fish north, west, and south of this area with extra-large mesh gillnets without a monitor on board. Therefore, the originally proposed NLCA exemption areas would require more monitoring than the above referenced exempted fishing areas.

3.7 NO ACTION ALTERNATIVE

If this alternative is selected for any of the proposed exemptions, sector vessels would not be able to fish in those year-round closed areas unless fishing within an exiting, approved Special Access Program. The No Action Alternative is the disapproval of the exemption and addendum to any sector's operations plan. The No Action Alternative would result in sector vessels operating under the operations plans as approved for the start of the 2013 FY on May 1, 2013. The No Action Alternative serves as the baseline scenario as it represents a continuation of the current condition. Table 3 below summarizes the sector-specific exemptions currently approved for FY 2013.

Table 3. FY 2013 Approved Exemptions and Proposed Addtional Exemptions by Sector (as of May 1, 2013)

		FGS	NCCS	NEFS II	NEFS III	NEFS IV	NEFS V	NEFS VI	NEFS VII	NEFS VIII	NEFS IX	NEFS X	NEFS XI	NEFS XII	NEFS XIII	MCS	SHS 1	SHS 3
	FY 2013 Approved Exemptions																	
1	The limits on the number of gillnets for Day gillnet vessels*	X	X		X		X	X	X			X	X	X	X	X	X	X
2	Gear requirements in the U.S./Canada Management Area	X		X			X	X	X	X	X	X			X		X	X
3	Seasonal restrictions for the Eastern U.S./Canada Haddock SAP	X		X			X	X	X	X	X	X			X		X	X
4	Seasonal restrictions for the CA II Yellowtail Flounder/Haddock SAP	X		X			X	X	X	X	X	X			X		X	X
5	Sampling Exemption	X	X															
6	The 120-day gillnet block out of the fishery	X	X		X		X	X	X			X	X	X	X	X	X	X
7	The 20-day spawning block	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
8	The prohibition on hauling another vessel's gillnet gear	X			X			X	X			X	X	X	X	X	X	X
9	The number of gillnets that may be hauled on GB when fishing on a groundfish/monkfish DAS	X			X		X	X	X			X	X	X	X	X	X	X
10	The number of hooks that may be fished	X	X		X			X	X			X	X	X	X	X	X	X
11	The DAS Leasing Program length and horsepower restrictions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	The prohibition on discarding	X	X	X	X				X	X			X	X	X		X	X
13	Daily catch reporting by sector managers for sectors vessels fishing in CA I Hook Gear Haddock SAP	X		X				X	X		X	X			X		X	X
14	Powering a VMS while at the dock	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	Prohibition on fishing inside and outside the CA I Hook Gear Haddock SAP while on the same trip	X		X				X	X	X	X	X			X		X	X
16	The 6.5-inch minimum mesh size requirement on targeted redfish trips	X*		X*	X*		X*	X*	X*	X*		X*	X*	X*	X*	X*	X*	X*
17	The prohibition on a vessel hauling another vessel's hook gear	X	X		X			X	X			X	X	X	X		X	X
18	The requirement to declare intent to fish in the Eastern U.S./Canada SAP and the CA II Yellowtail flounder/Haddock SAP	X		X			X	X	X	X	X	X			X		X	X
*Additional Exemptions Proposed for FY 2013 **																		
19	Access to Closed Area I Year Round Closed Area																	
20	Access to Central Portion of Close Area II Year Round Closed Area																	
21	Access to Western Portion of Nantucket Lightship Closed Area																	
22	Access to Eastern Portion of Nantucket Lightship Closed Area																	
23	Access to Western Portion of Nantucket Lightship Closed Area With Standard Monitoring Coverage																	
24	Access to Eastern Portion of Nantucket Lightship Closed Area With Standard Monitoring Coverage																	

*** Exemption approved but not granted to the sector because it has not submitted an industry-funded monitoring program**

**** Which sectors request the additional exemptions iwill be determined after the final rule is published**

3.8 CONSIDERED BUT REJECTED ALTERNATIVES

FW 48 included potential access to portions of all year-round closed areas, including the Western Gulf of Maine year round closed area and Cashes Ledge year round closed area that do not overlap with the existing habitat closures (see Figure 1). However, due to concern of potential impacts on Gulf of Maine cod, Gulf of Maine haddock, and harbor porpoise, these areas are not being considered under this action. Ongoing development of the EFH Omnibus Amendment by the CATT has highlighted the importance Gulf of Maine cod population within the Western Gulf of Maine year round closed area. Further these areas include a greater proportion of more vulnerable hard bottom habitat than the areas being considered in this action. For these reasons, exemptions from the Western Gulf of Maine year round closed area and Cashes Ledge year round closed area are not included in this action. The current analysis that has been done in FW 48, the EFH Ominibus Amendment, and this EA does not appear to support the opening of the Western Gulf of Maine or Cashes Ledge areas as they do not appear to be as likely to maximize the harvest of healthy stocks without compromising 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. This includes ensuring that additional opportunity provided by closed area access would not jeopardize stock rebuilding or ongoing habitat omnibus amendment efforts.

In preparation of this EA, NMFS considered allowing sectors to propose either entirely new exemptions or variations of previously approved exemptions unrelated to closed areas. However, NMFS considered this alternative unreasonable because sectors need to operate with additional exemptions within the current fishing year (FY 2013). Allowing sectors to propose entirely new exemptions or changing already approved exemptions to the list of alternatives could result in implementation delays due to the timeframes associated with the additional analysis, impacts review and rule making. In addition, this action is intended to be a continuing part of approving FY 2013 sector operations plans, in which other alternative measures have already been considered. Sectors will have an opportunity to propose any new or revised exemptions in their operations plans for FY 2014.

NMFS considered but rejected an alternative that would allow sector vessels to fish in either Closed Area I or II with less than 100 percent industry-funded at-sea monitoring coverage. Georges Bank cod and yellowtail flounder are both severely depleted, reside in these areas. Therefore, it is appropriate to require additional monitoring coverage if they were opened, so that we could thoroughly account for catch and discards. There is very little historical catch data from these areas, and we are concerned that observing less than 100 percent of the trips into the area could be insufficient to identify changes in the discard rates for groundfish stocks. Lesser coverage would only increase our concerns over Georges Bank yellowtail flounder. NMFS could not conclude that allowing a lower level of observer coverage into Closed Area I and II would not jeopardize stock rebuilding efforts for Georges Bank cod and yellowtail flounder. Further, comments submitted by industry explain that they are unwilling to pay for at-sea monitoring, so even allowing a lower coverage rate would not provide any additional flexibility to industry.

4.0 AFFECTED ENVIRONMENT

The affected environment section focuses on the valued ecosystem components (VECs) and information relevant to the closed area exemptions and measures considered in this action. Please refer to the FY 2013 Sector Operations and Contracts EA for further detailed descriptions the VECs.

4.1 FW 48 AND CATT ANALYSIS OF CLOSED AREA 1, CLOSED AREA II, AND NANTUCKET LIGHTSHIP CLOSED AREAS

4.1.1 Biological Characteristics

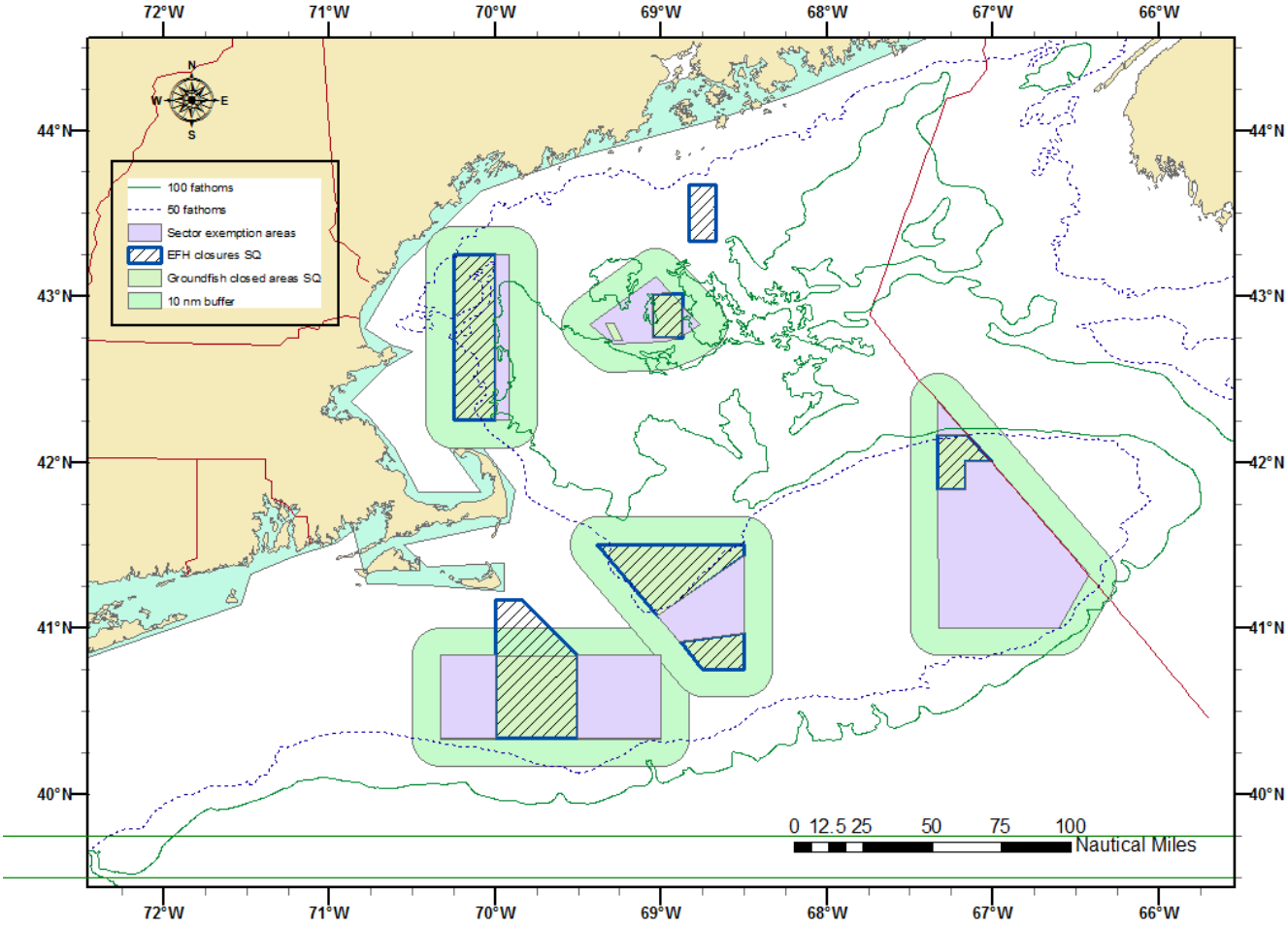
4.1.1.1 Analysis of biological samples on the NMFS spring, fall, and winter surveys

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 Closed Area I, Closed Area II, and Nantucket Lightship Closed Areas. 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 2Figure 1). In many cases, data were insufficient to analysis on an area by area basis, but important differences are noted whenever possible.

- Proposed sector exemption areas including non-habitat closure portions of Closed Area I, Closed Area II, and Nantucket Lightship Area.
- Habitat closure areas including the Cod HAPC, portions of Closed Area I, and all of the area that partially overlaps the Nantucket Lightship Area.
- A 10 nm buffer zone 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.
- All remaining areas open to fishing, 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 2. 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.

4.1.1.2 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 statististics 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 4).

Table 4. 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.

4.1.1.3 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.

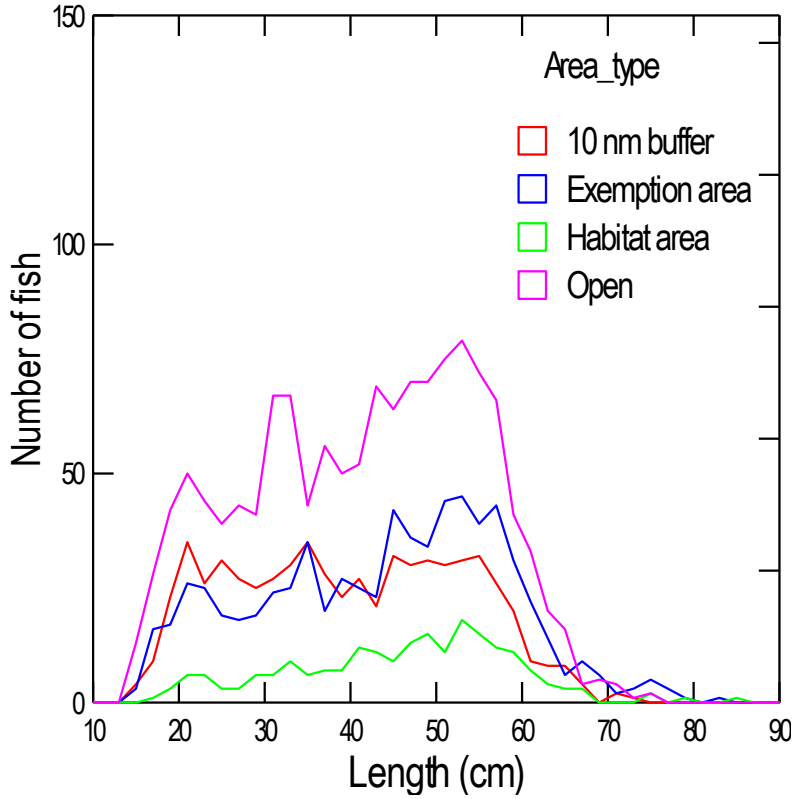
4.1.1.4 Comparative analysis of biological characteristics

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.

4.1.1.4.1 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 3). Greater proportions of larger haddock occur in these areas than elsewhere.

Figure 3. Comparative length frequencies of female Georges Bank haddock during 2002-2012 spring surveys

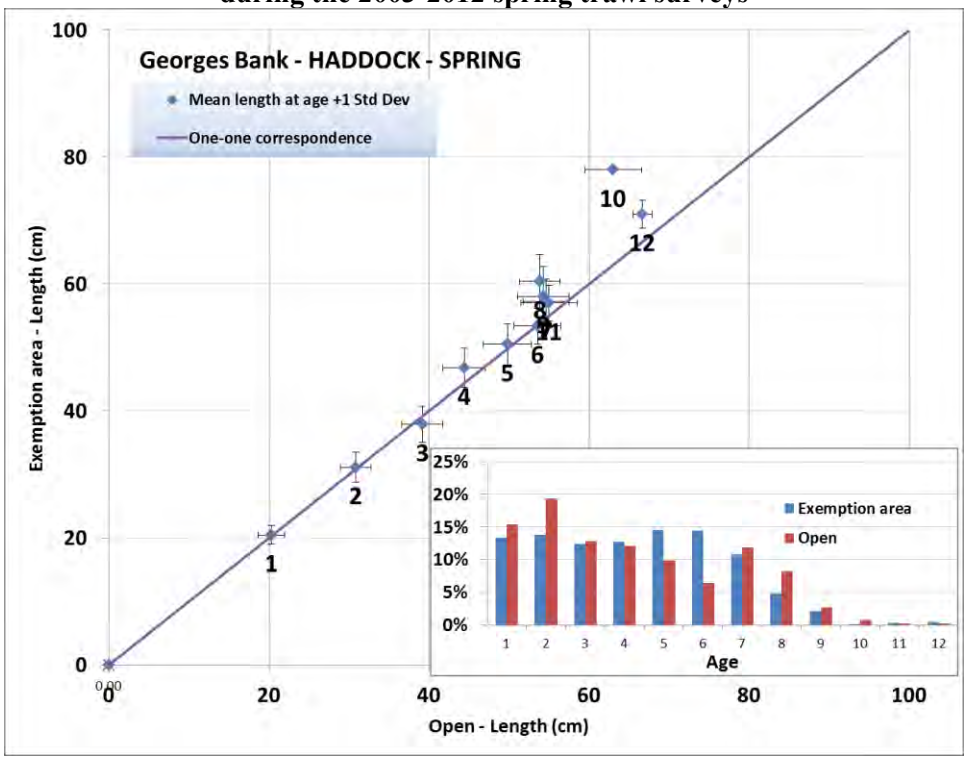


This observation based on analysis of NMFS trawl survey data is supported from the results of Kerr et al (ms), which found that the Closed Area I and Nantucket Lightship Area closures had a significant positive effect on haddock biomass. Kerr et al. however did not find significant positive effects for haddock in Closed Area II, despite the large amounts of haddock biomass that occurs there. Kerr et.a. 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 4). Generally the proportions for the 2001, 2002, and 2004 year classes should be ignored due to low sample size.

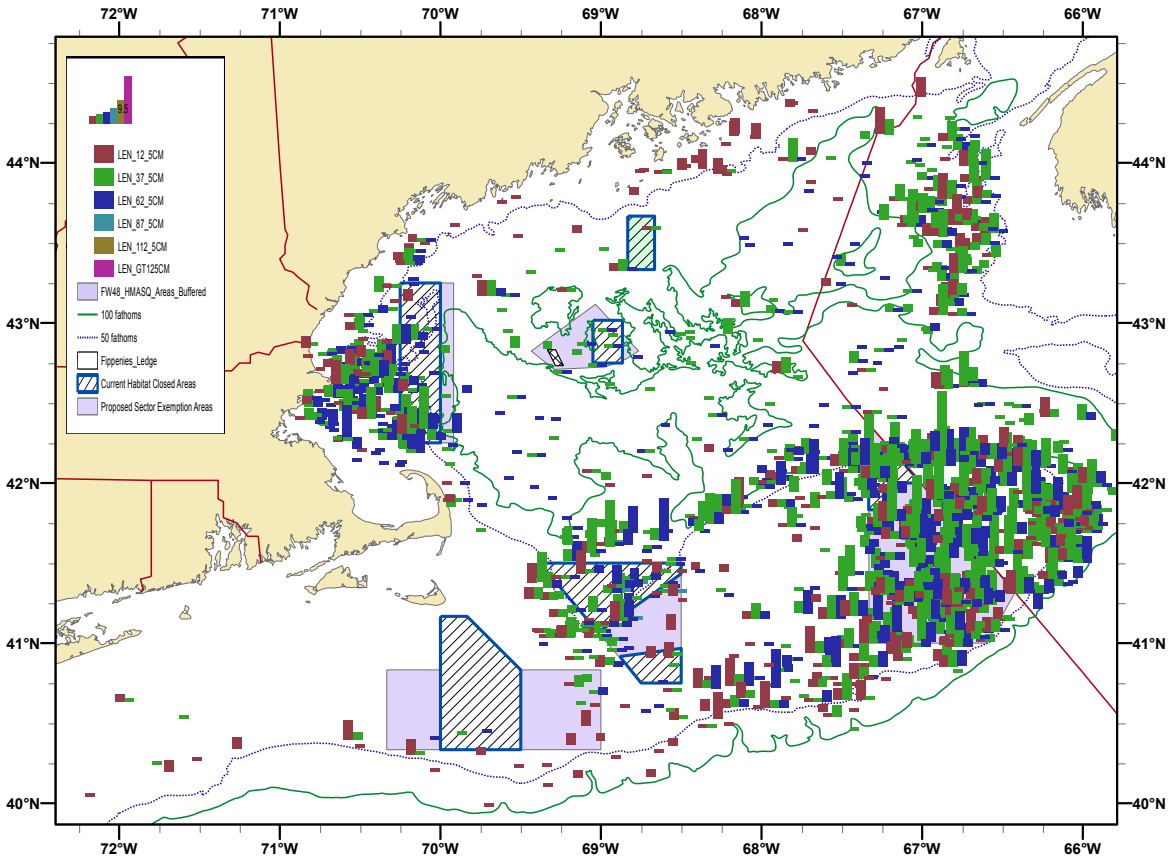
The lenghs at age show a slight trend toward larger fish in the Georges Bank exemption areas (Figure 4). Points falling on the line of one to one correspondence indicate that the lengths at age are identical. Points falling above the line indicate that the haddock in the exemption areas or habitat areas are larger than those at the same age in open fishing areas, and vice versa.

Figure 4. 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



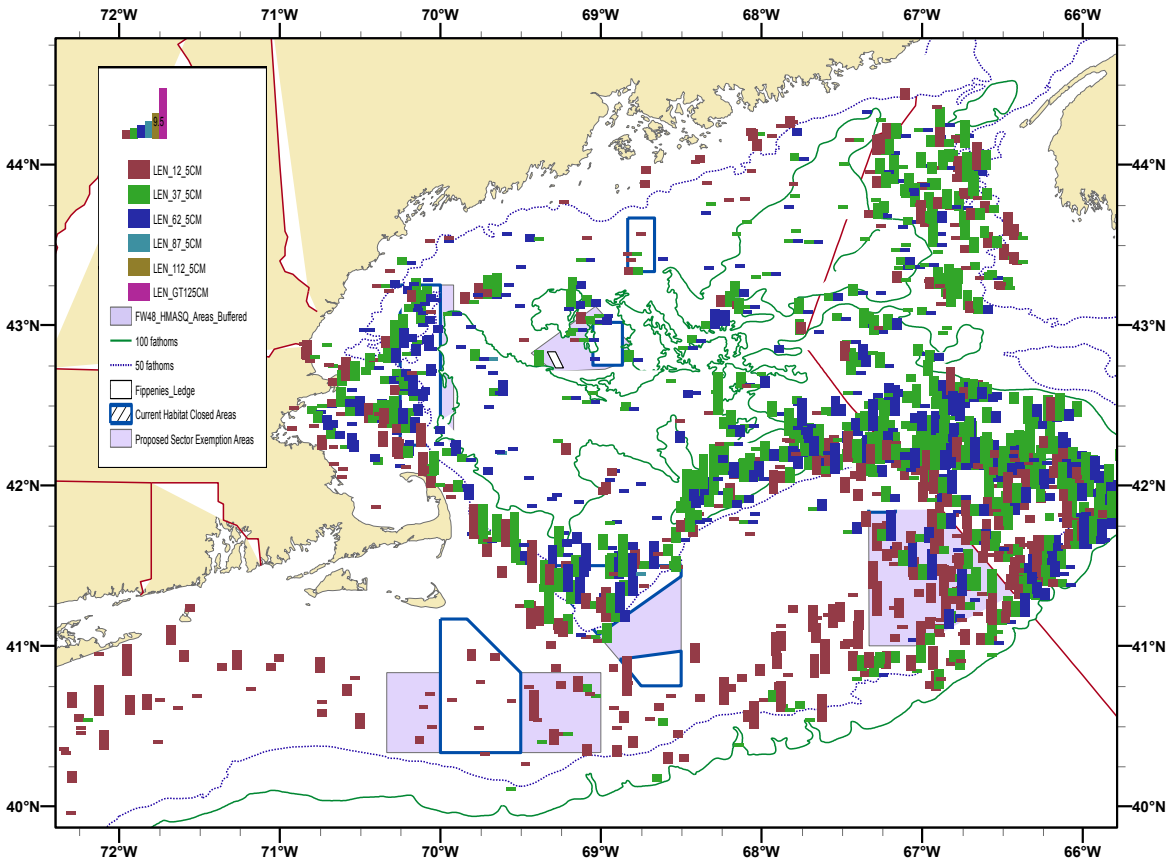
Larger haddock appear to be widely distributed across the eastern part of Georges Bank, particualrly in Closed Area II and in Canadian waters (Figure 5), during the spring survey. Haddock elsewhere tend to be smaller, whether on the western part of Georges Bank or in the Gulf of Maine. Most of the haddock 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 5).

Figure 5. Geographical distribution of female haddock length frequency during the 2003-2012 spring trawl surveys.



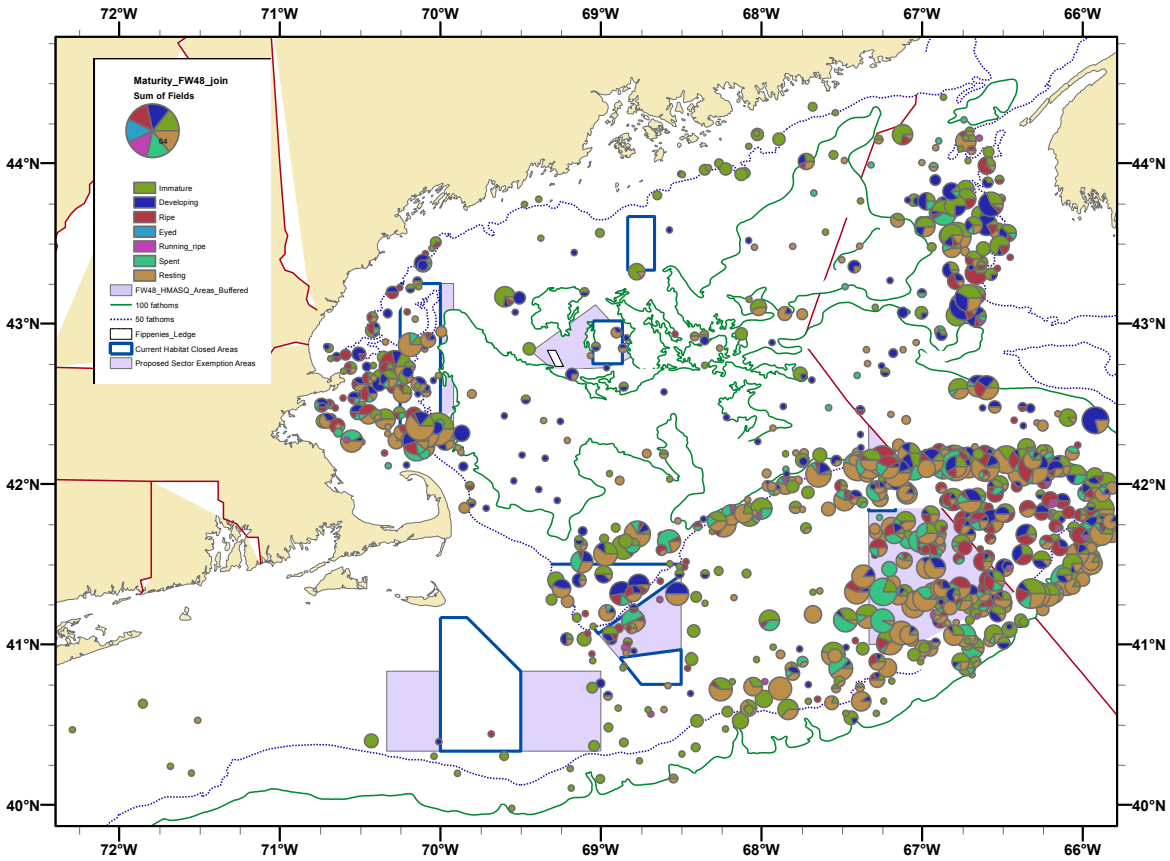
In contrast to the spring survey data, the smaller haddock in the fall occupy the shallower portions of Georges Bank, the Great South Channel, and Massachusetts Bay (Figure 6). Larger haddock (i.e. > 30 cm) occupy deeper water along the northern edge of Georges Bank, which overlaps the Cod HAPC and Closed Area II north of the HAPC, and in the northern part of Closed Area II which is also a habitat closed area.

Figure 6. 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 7).

Figure 7. 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 8). 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 8. Geographical distribution of 8+ female haddock during the 2003-2012 spring, 2002-2011 fall and 2002-2007 winter trawl surveys.

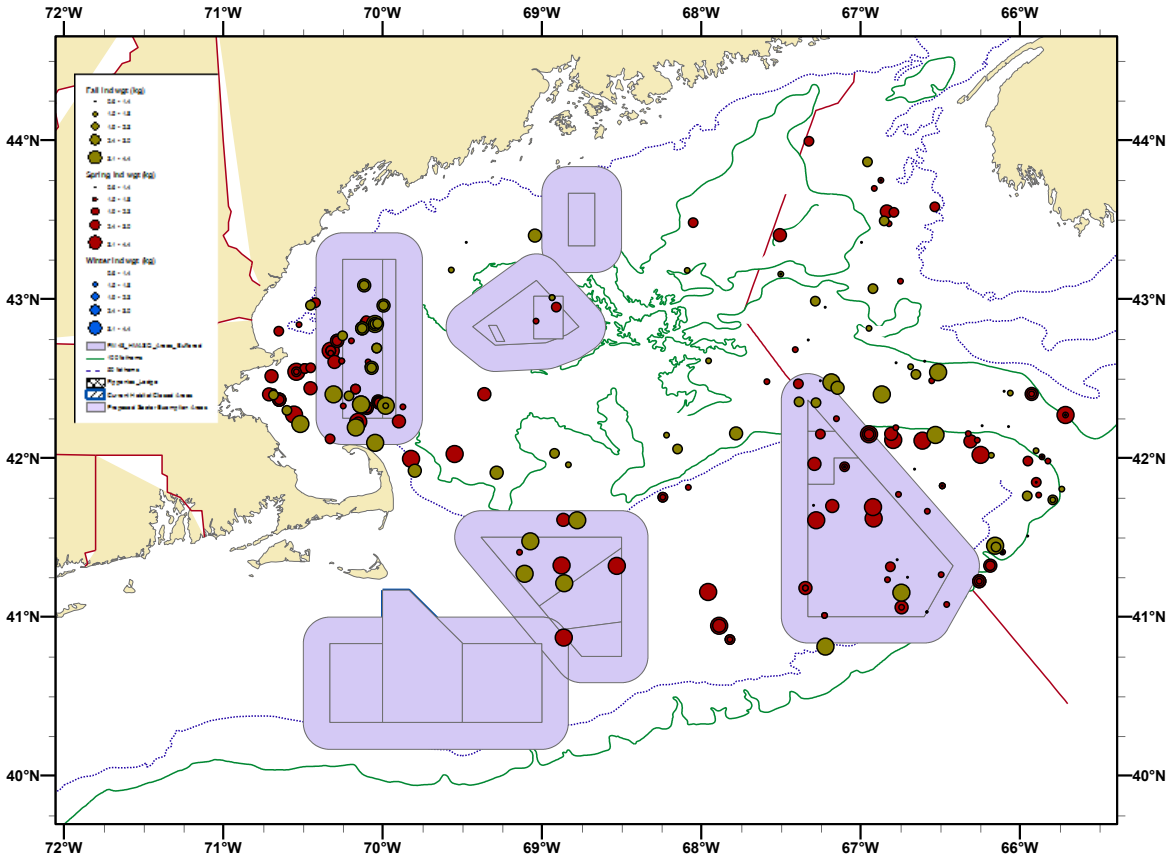


Figure 9. Year class strength and percent of aged haddock in spring survey samples by management area and year class.

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 10). There does not seem to be any concentration of larger (weight) fish in area particular area (Figure 11).

Figure 10. Haddock distribution maps from survey tows

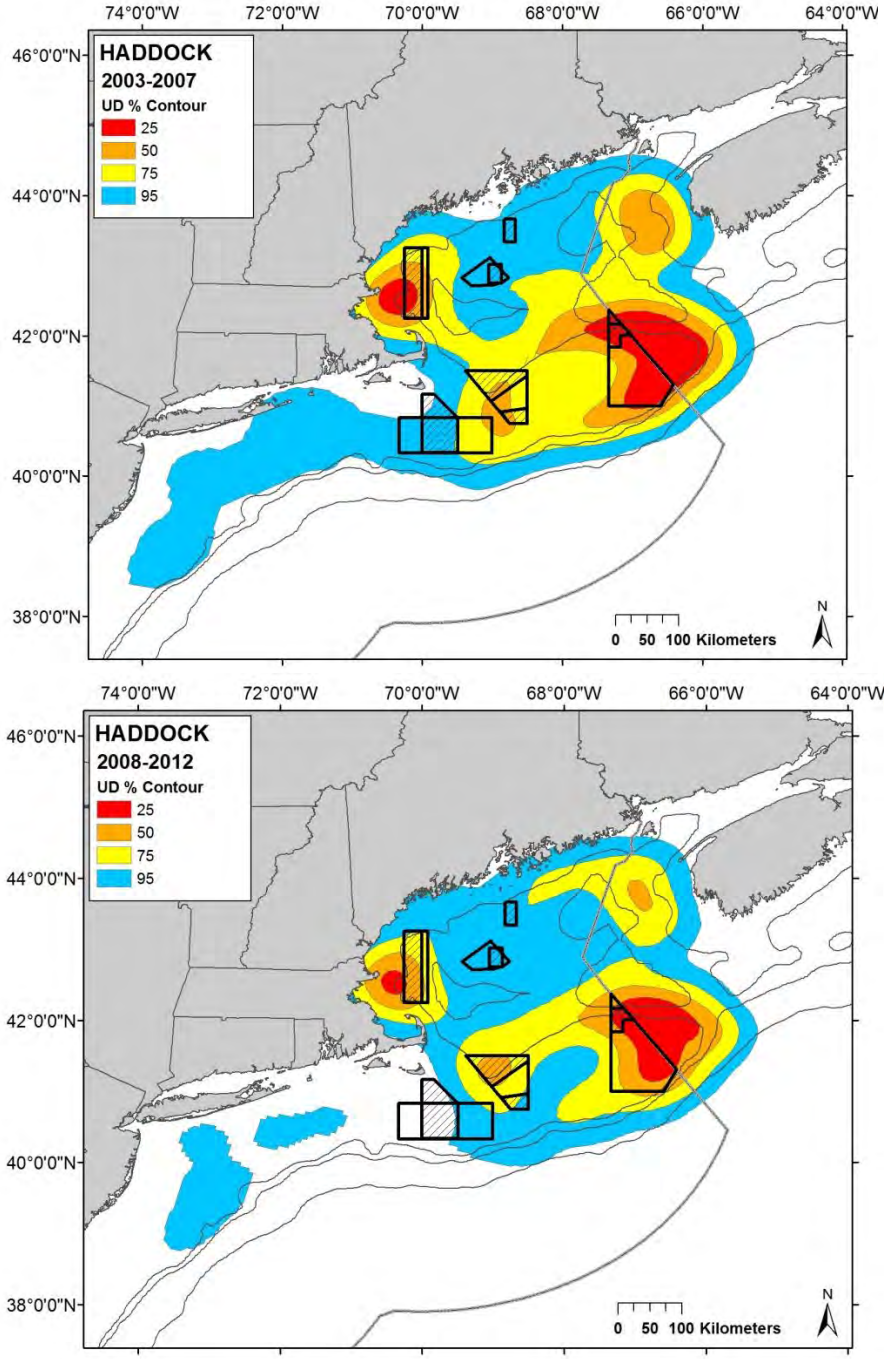
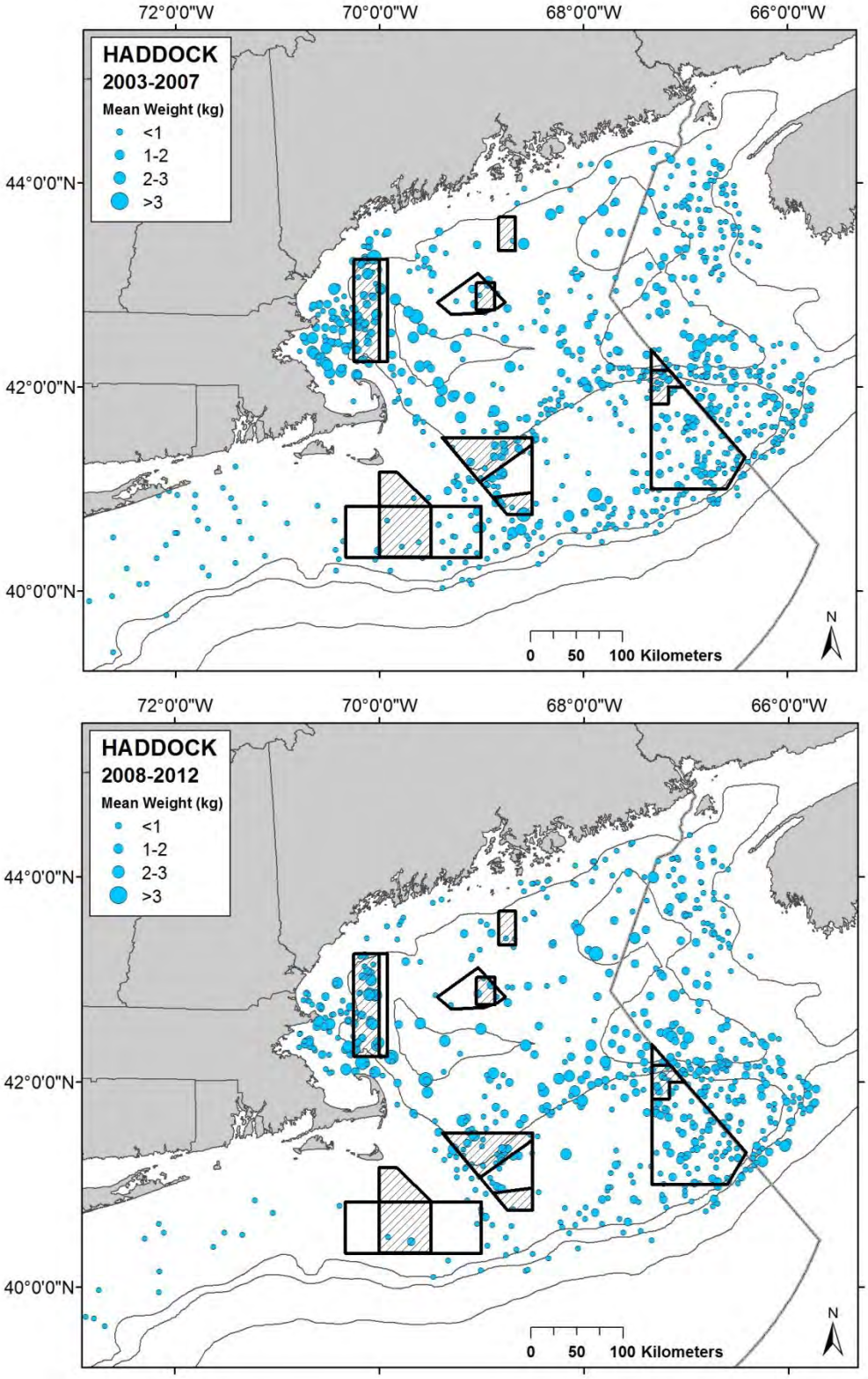


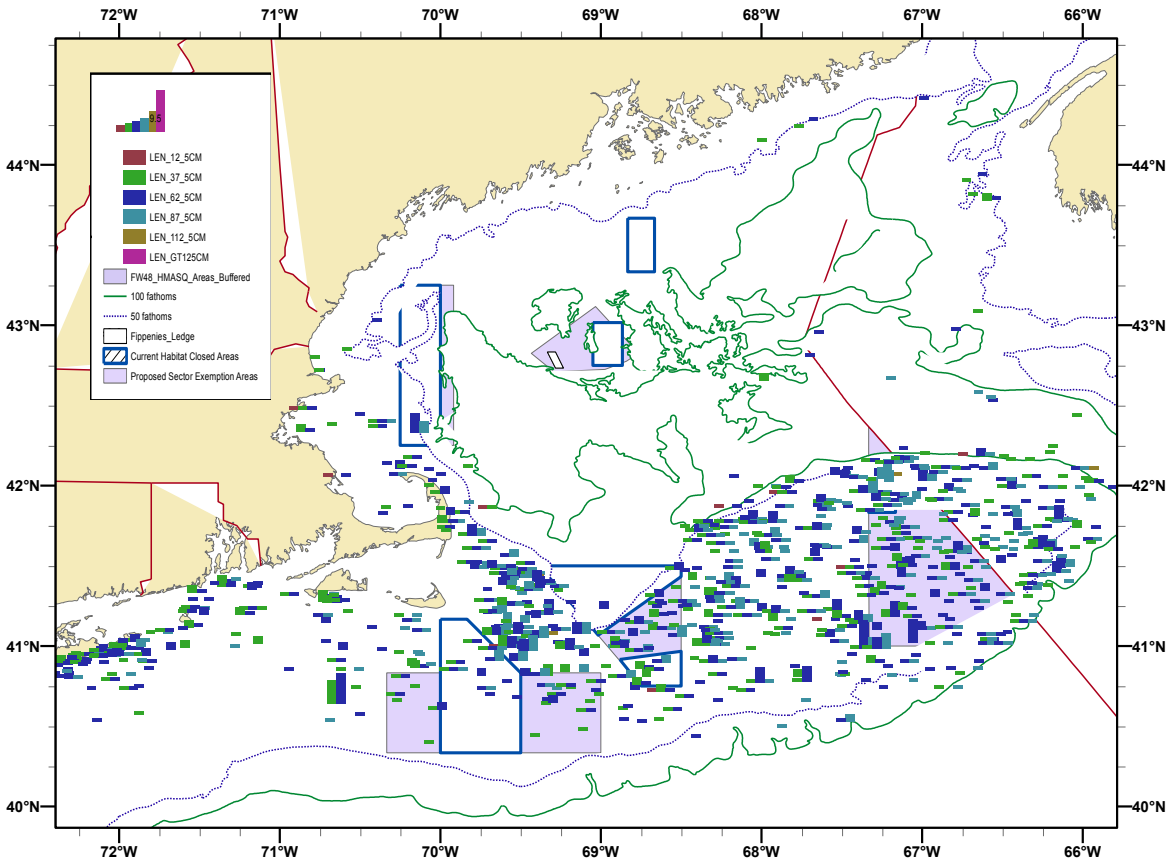
Figure 11. Haddock mean weight per tow from survey tows



4.1.1.4.2 Winter skate

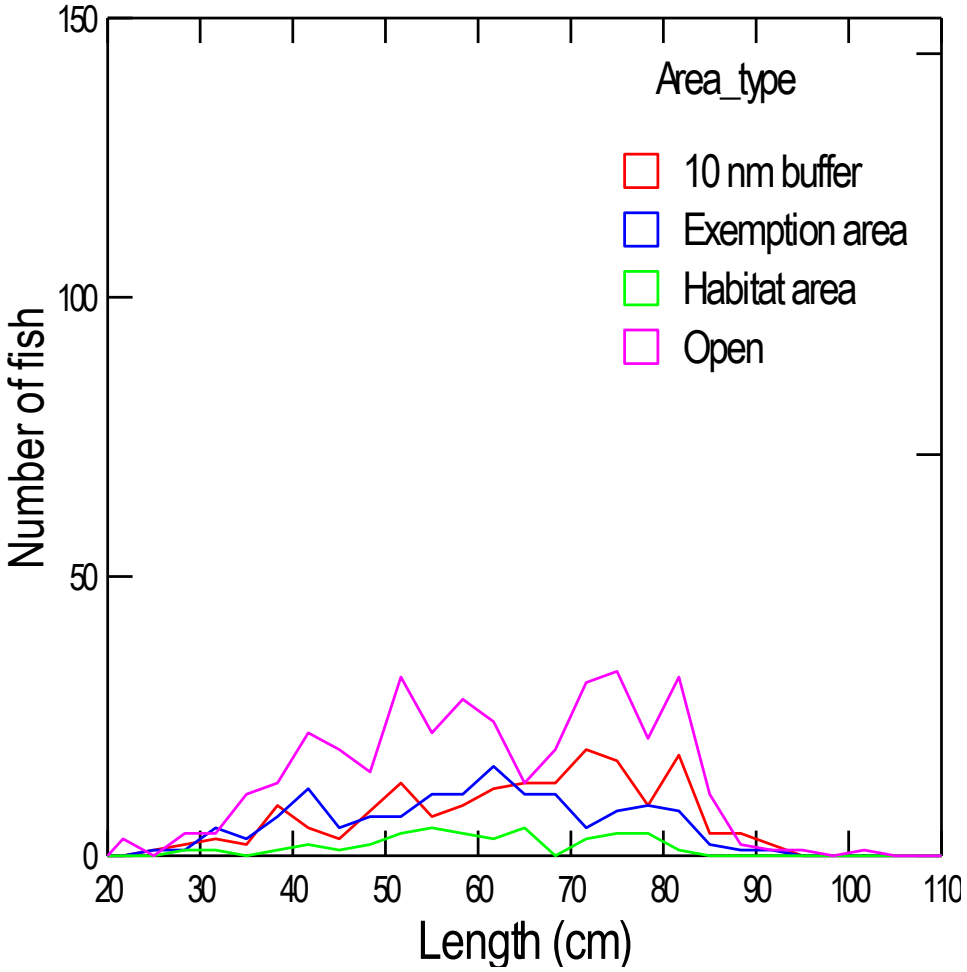
Winter skate are a primary target species for some vessels in the groundfish fleet, using trawls and particularly gillnets. Winter skate captured in the spring and fall (Figure 12) trawl surveys are widely distributed across Southern New England, Georges Bank, and the southern part of the Gulf of Maine. In the Gulf of Maine, few winter skate were observed in the Western Gulf of Maine or Cashes Ledge areas, however.

Figure 12. 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 13) and other biological characteristics in these areas is unremarkable. Winter skate are routinely sampled for length, weight, and maturity, but are not aged.

Figure 13. 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 14). There does not appear to be any trends in weight/tow (Figure 15).

Figure 14. Winter skate distribution maps from survey tows

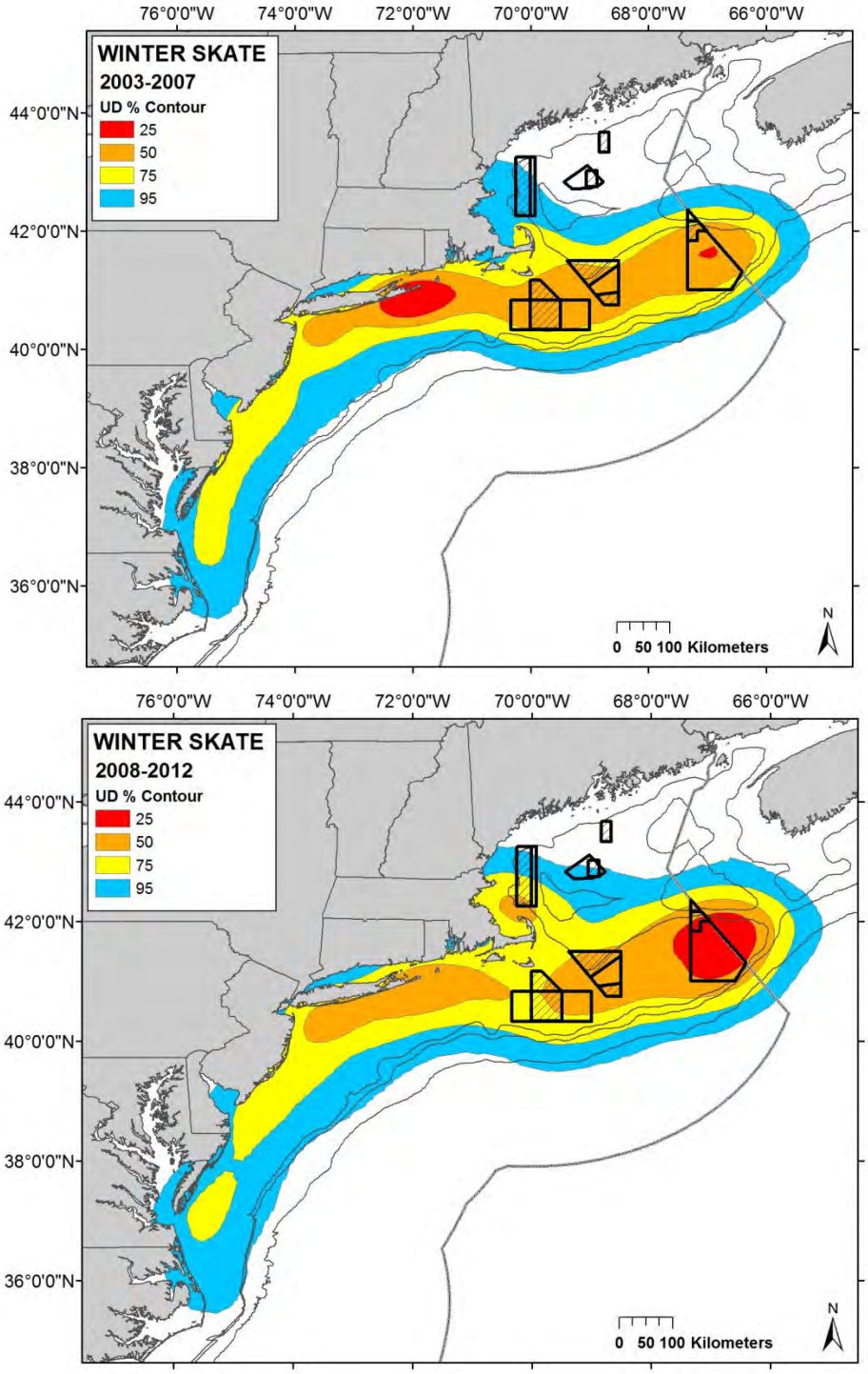
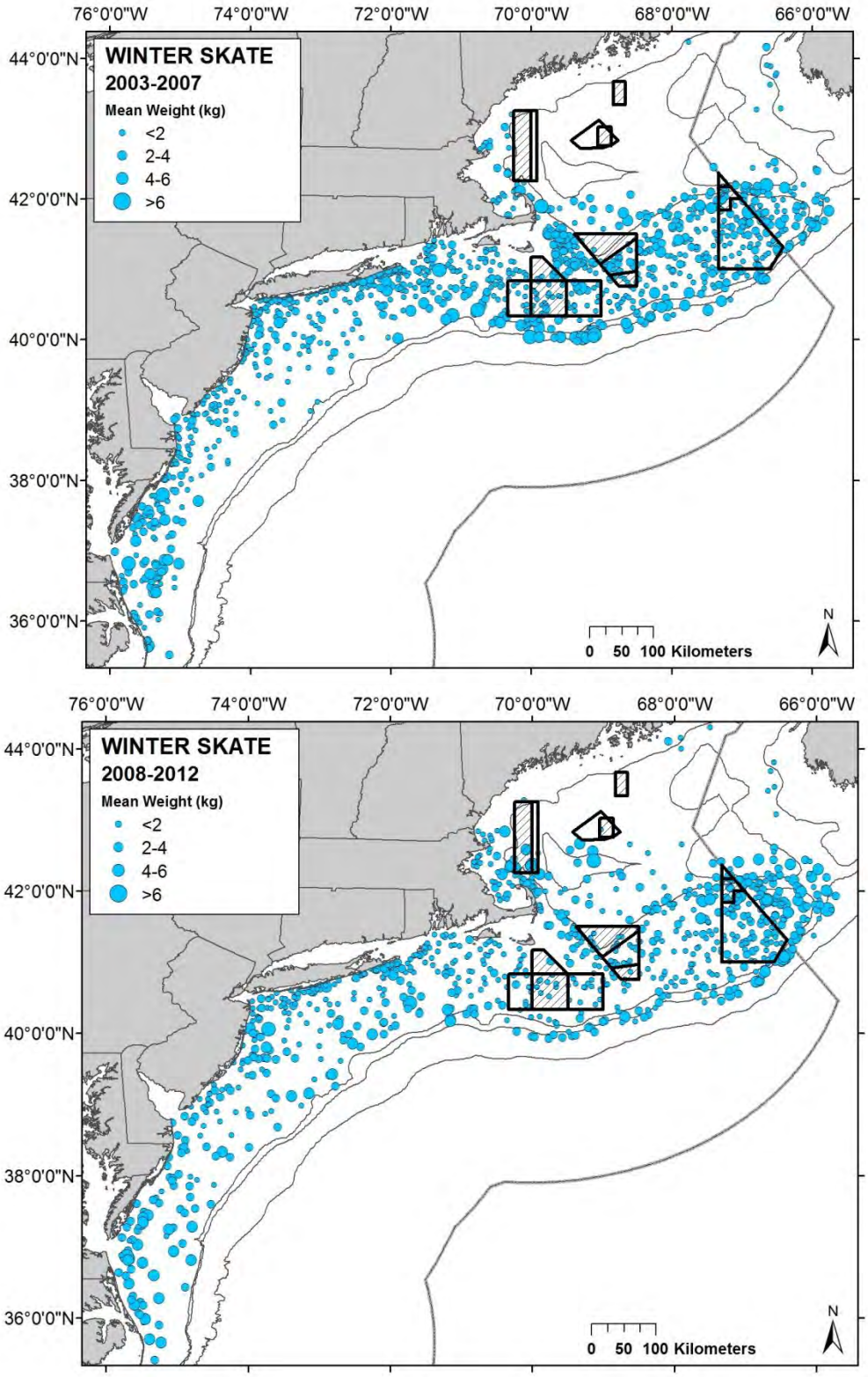


Figure 15. Winter skate mean weight per tow from survey tows



4.1.1.4.3 Atlantic cod

Like some other species, year round groundfish closed areas appears to provide some added protection to cod. Female cod in the sector exemption and existing EFH in Georges Bank (Figure 16) are larger than in either the currently open fishing areas or in a 10 nm buffer around the closed areas, a region that is often more intesively fished than elsewhere. This length frequency difference is more noticeable in the spring survey data than in the fall survey data (Figure 17 for example), when cod may be more dispersed.

Figure 16. Comparative length frequencies of female Georges Bank cod during 2002-2012 spring surveys.

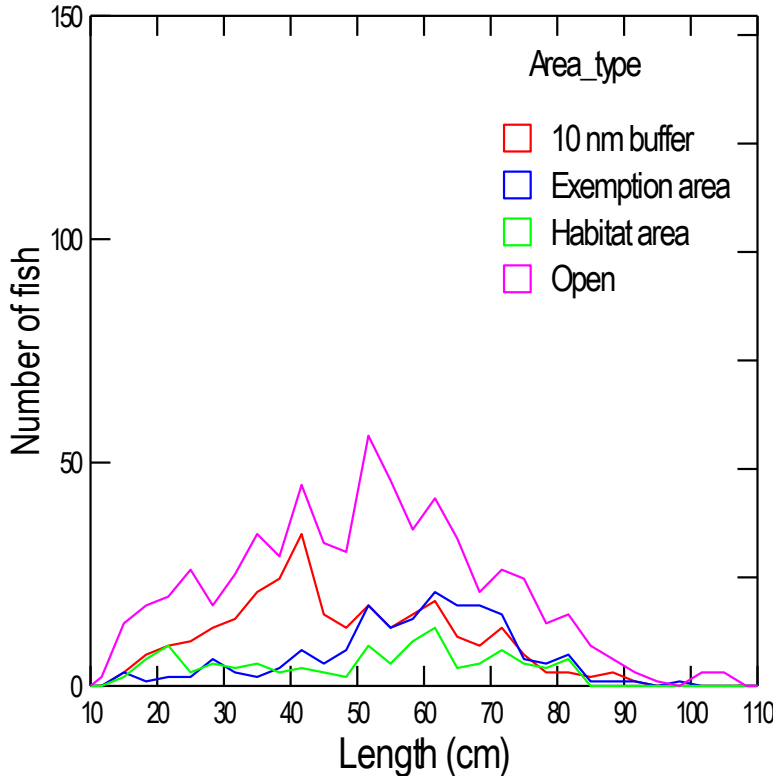
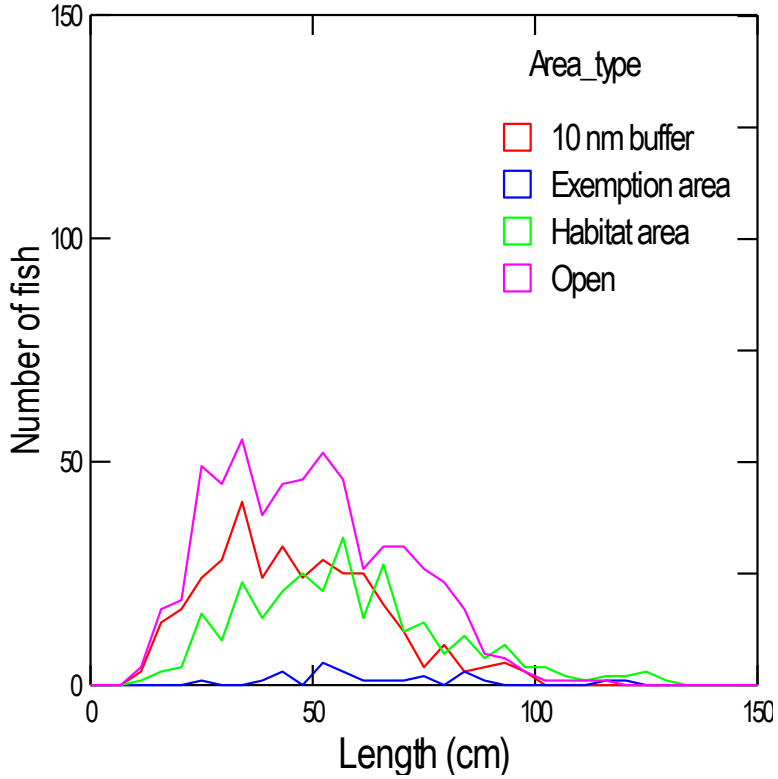
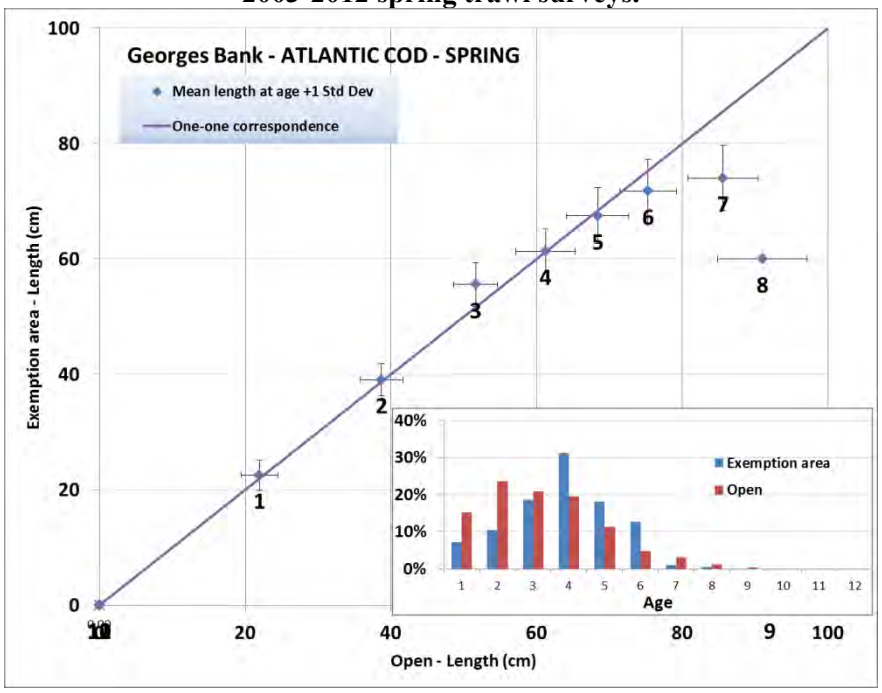


Figure 17. Comparative length frequencies of female Georges Bank cod during 2002-2012 fall surveys.



There are no apparent differences in mean weight at age in the exemption areas (Figure 18) from the Georges Bank, except for the apparent smaller size of ages 7 and 8 inside these areas. The age 7 and 8 means and variances are affected by low sample size, however, and should be interpreted cautiously.

Figure 18. Comparison of Georges Bank female cod 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.



During the spring survey, most of the sampled female cod on Georges Bank and particlarly in the Cod HAPC and Closed Area II were in resting condition (Figure 19). Further, there appear to be few if any differences in maturity stage at age (Figure 20). Of course, this observation from the spring survey data does not mean that Georges Bank cod don't spawn in and around Closed Area I, but rather that the spring survey misses the peak spawning activity there. Cod sampled for maturity in the spring survey around Closed Area I were mainly classified as immature, but occurred mainly in the nearby open fishing areas and to some extent in the existing habitat closure. The largest female code ages 5+ were scattered about Georges Bank, with no apparent concentration of fish (Figure 21).

Figure 19. Geographical distribution of female cod maturity stages during the 2003-2012 spring trawl surveys

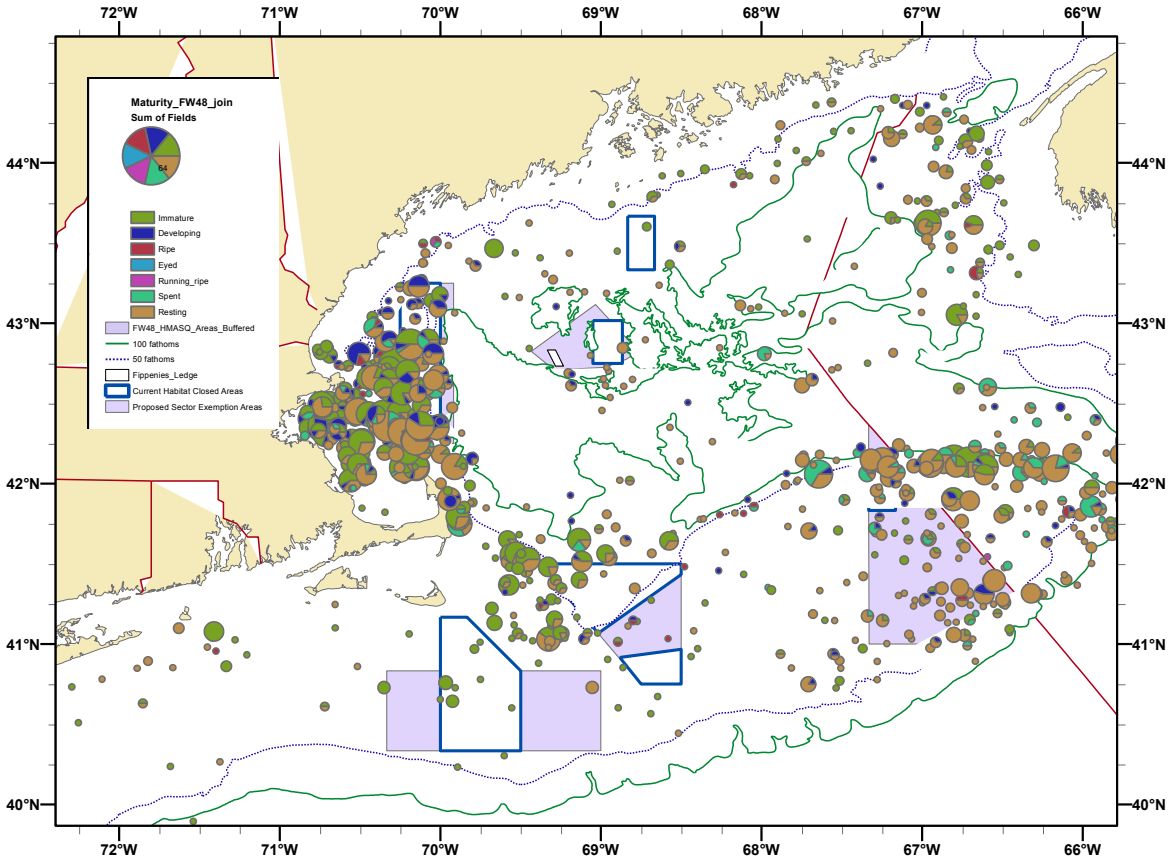


Figure 20. Proportion mature at age by type of management area for female Georges Bank cod sampled during the 2002-2012 spring surveys.

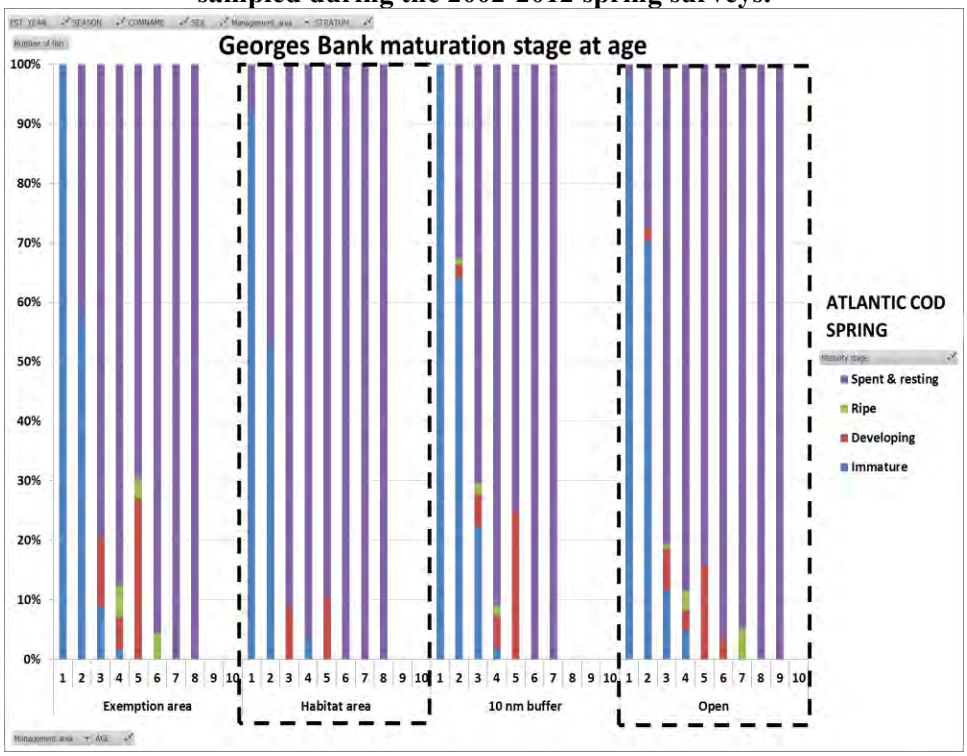


Figure 21. Geographical distribution of 5+ female cod during the 2003-2012 spring, 2002-2011 fall and 2002-2007 winter trawl surveys.

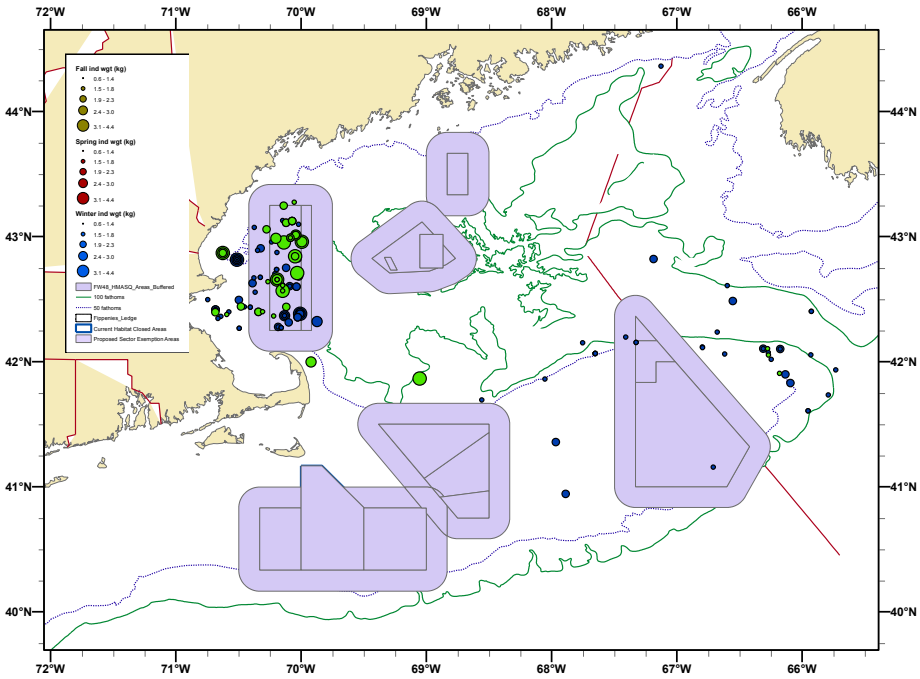
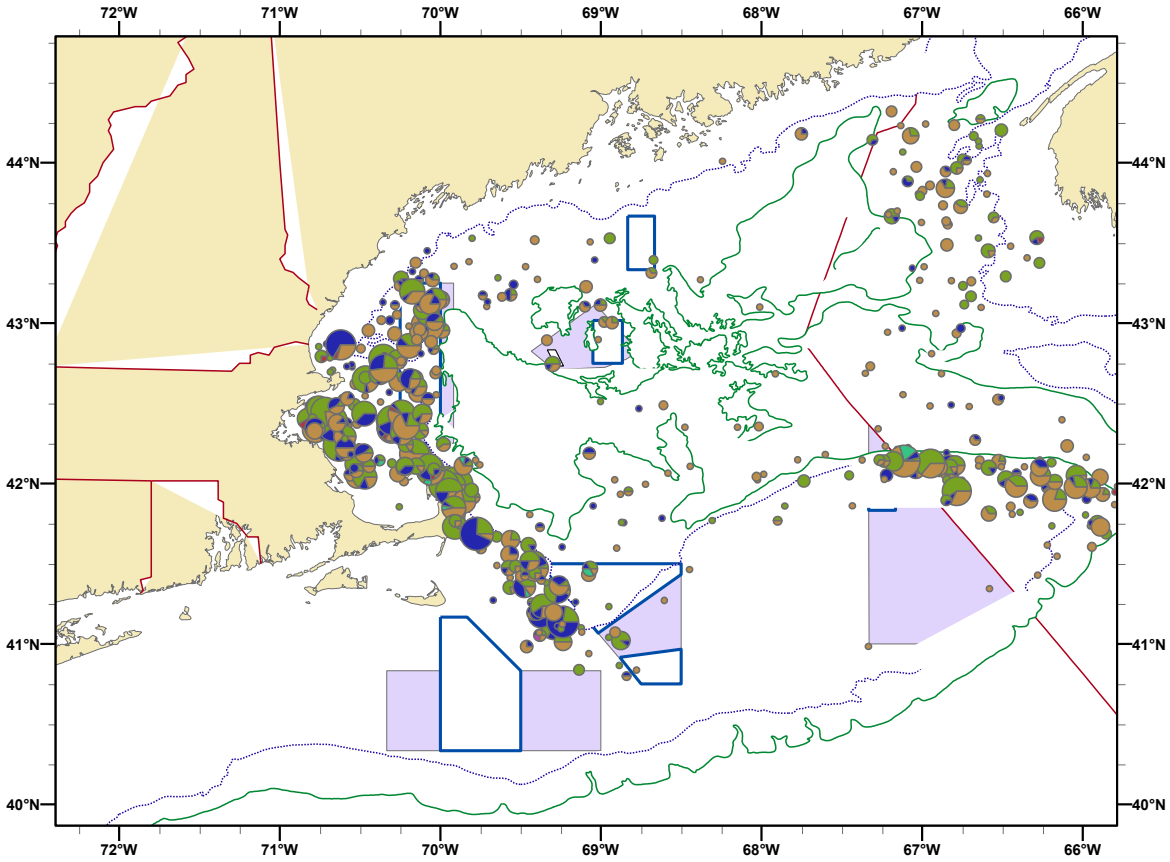


Figure 22. Geographical distribution of female cod maturity stages during the 2002-2011 fall trawl surveys.



Distribution maps from the surveys indicate that the majority of cod can be found in the Western Gulf of Maine Closed Area, beside and within the northwest side of Closed Area I, and in the northern and eastern side of Closed Area II. The strongest concentration of cod is found east of Massachusetts Bay and the southwest corner of the Western Gulf of Maine Closed Area (Figure 23). Larger cod are found in the Western Gulf of Maine Closed Area, in the central Gulf of Maine, and along the northern edge of Georges Bank, including the northern portions of Closed Areas I and II.

Figure 23. Cod distribution maps from survey tows

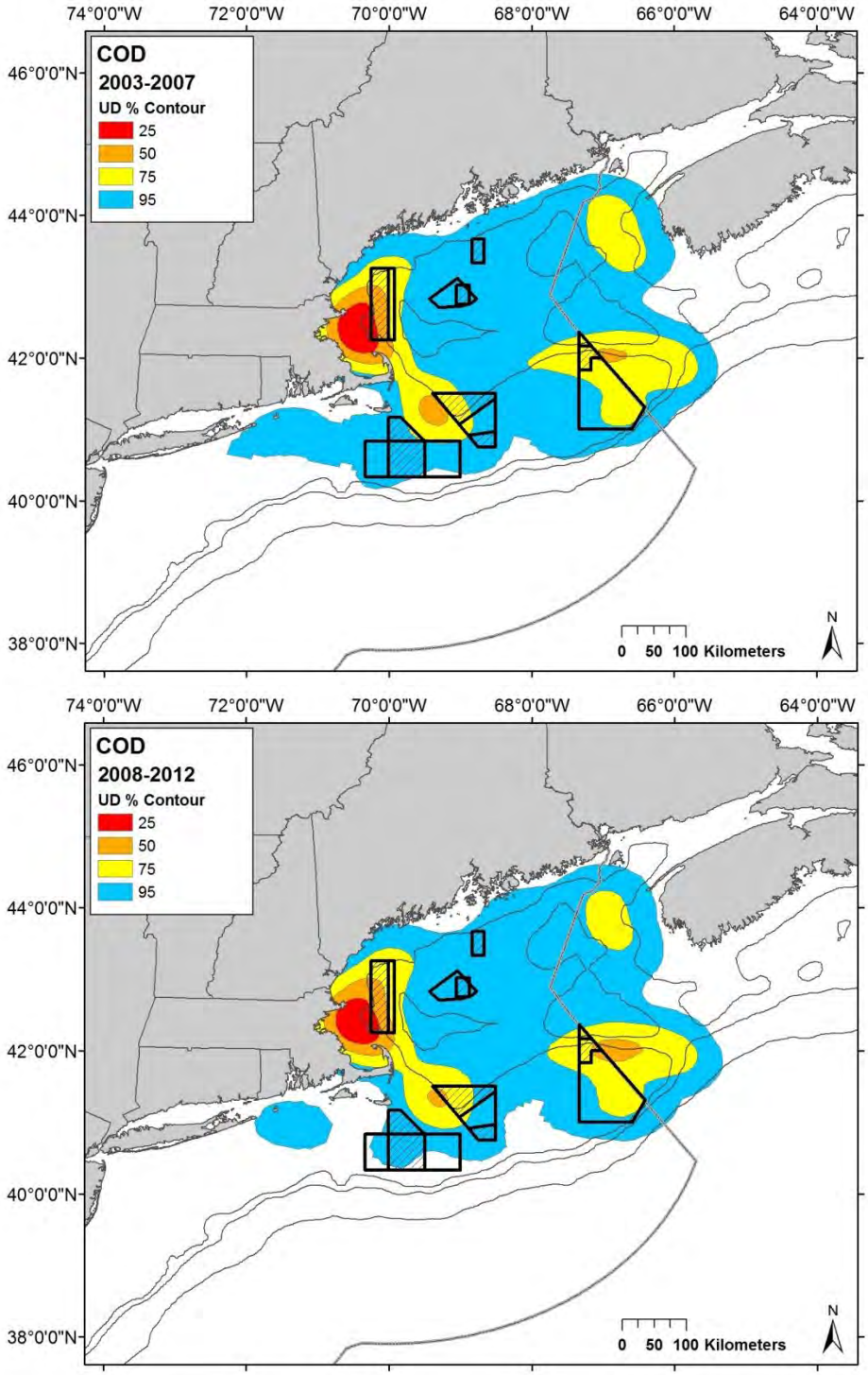
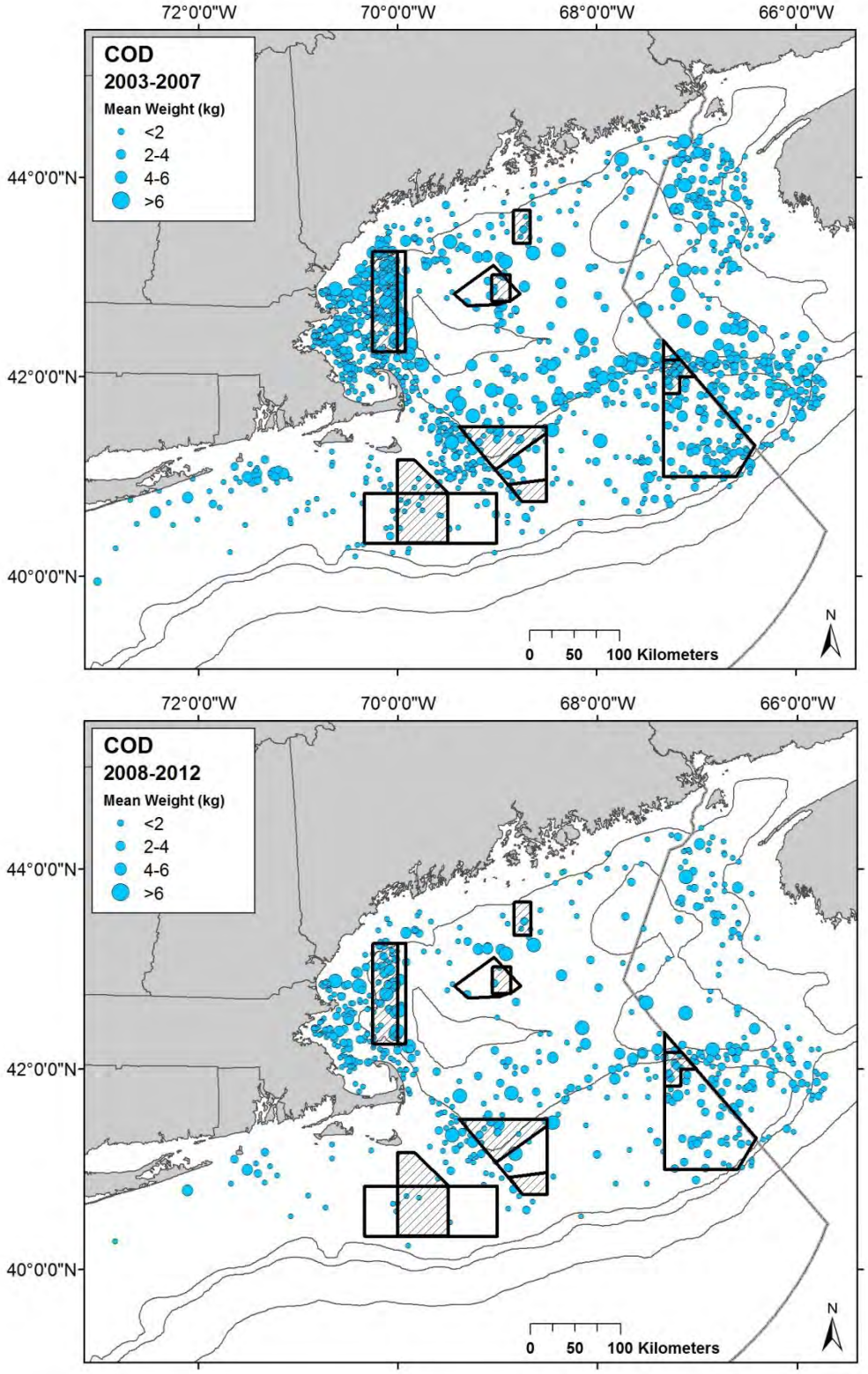


Figure 24. Cod mean weight per tow from survey tows



4.1.1.4.4 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 25), 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 26) 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 27) or the Gulf of Maine (Figure 28).

Figure 25. Geographical distribution of female yellowtail flounder maturity stages during the 2002-2012 spring trawl surveys.

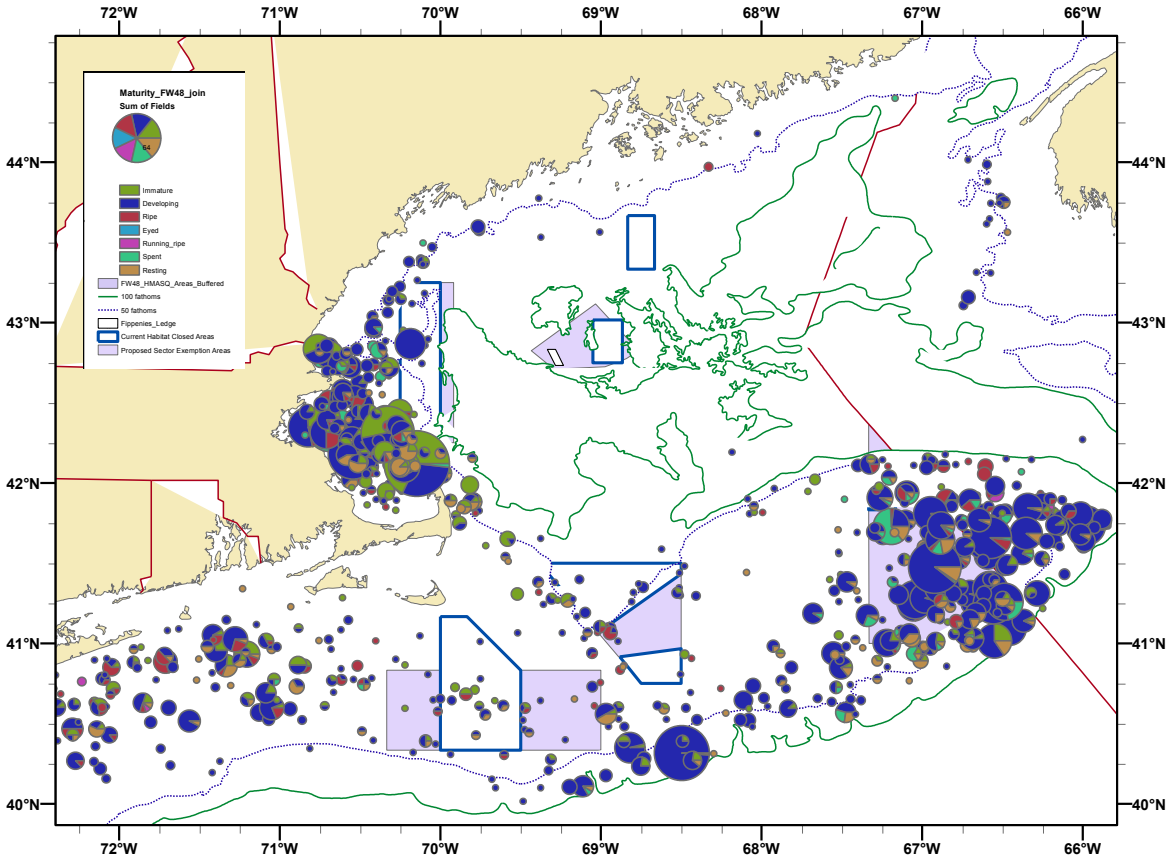


Figure 26. Comparison of Georges Bank female yellowtail flounder lengths at age between proposed those caught in the existing habitat areas and those caught in currently open fishing areas during the 2002-2012 spring trawl surveys.

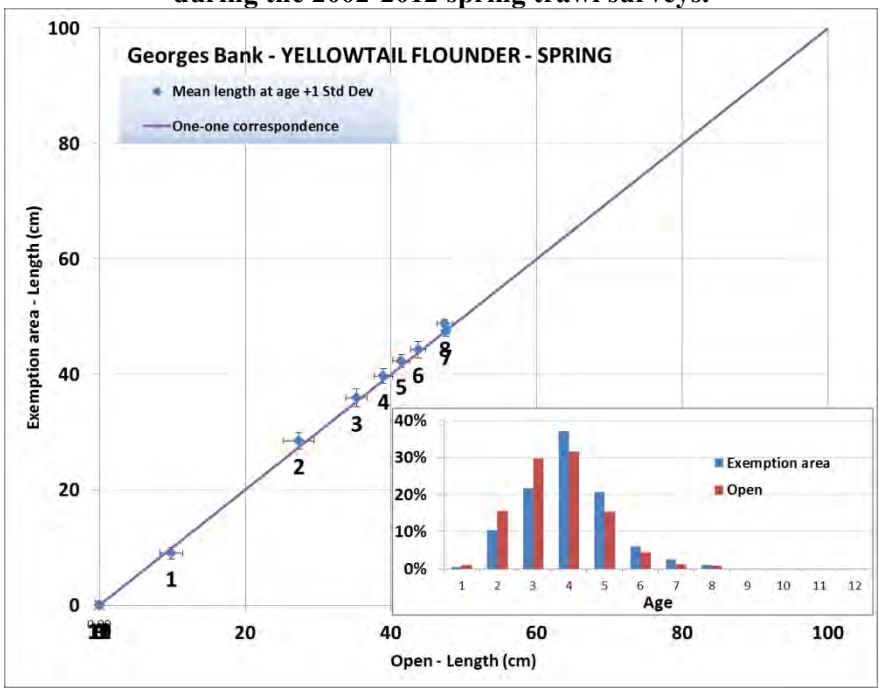


Figure 27. Comparative length frequencies of female Georges Bank yellowtail flounder during 2002-2012 spring surveys.

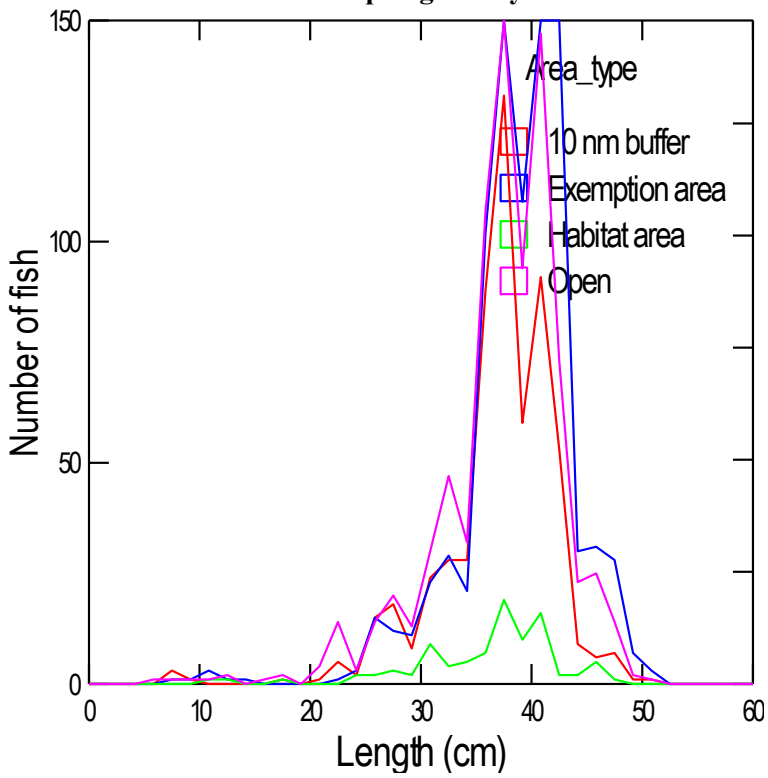
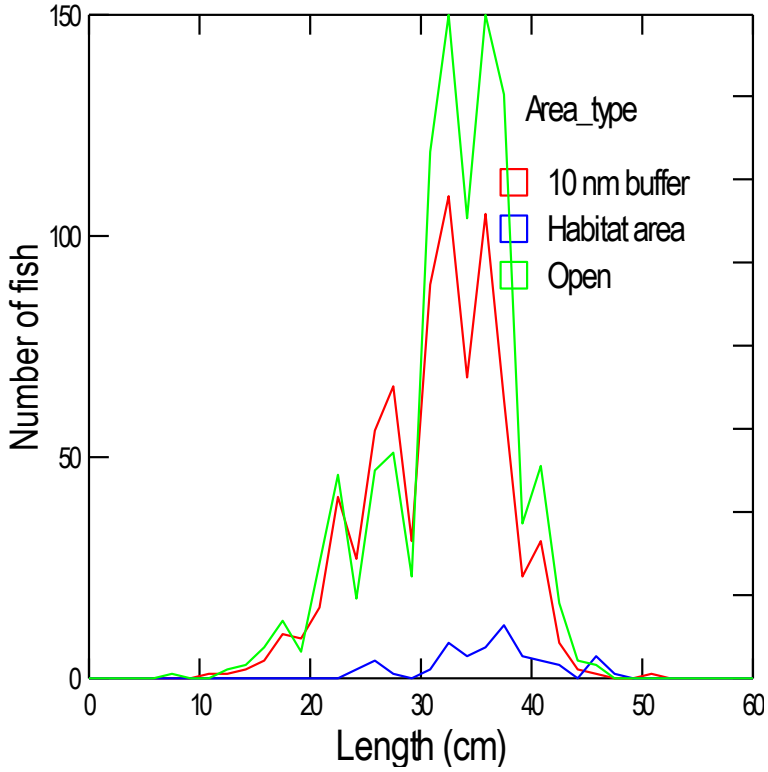
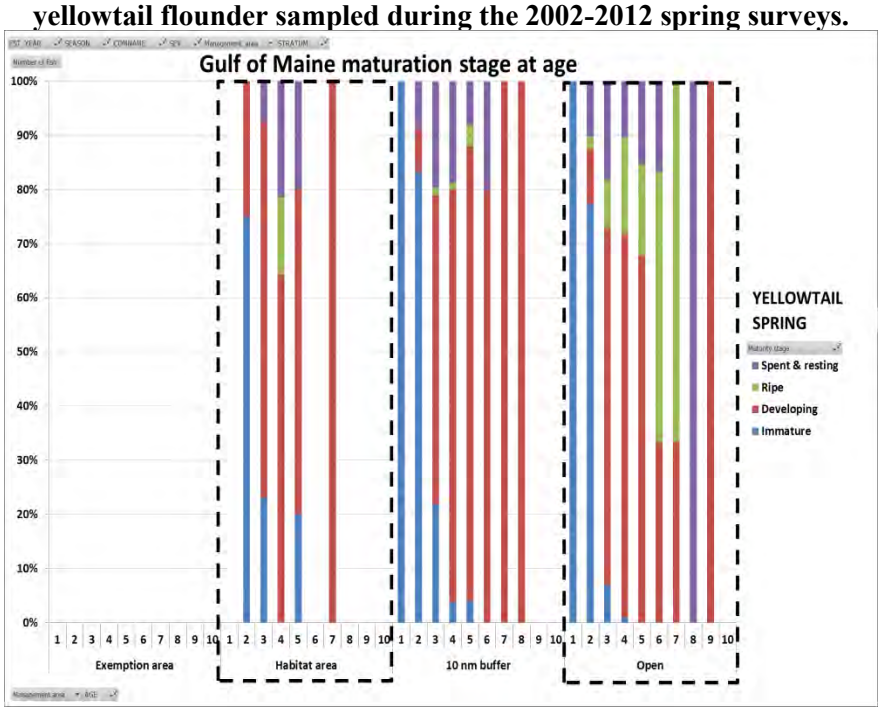


Figure 28. Comparative length frequencies of female Gulf of Maine yellowtail flounder during 2002-2012 spring surveys.



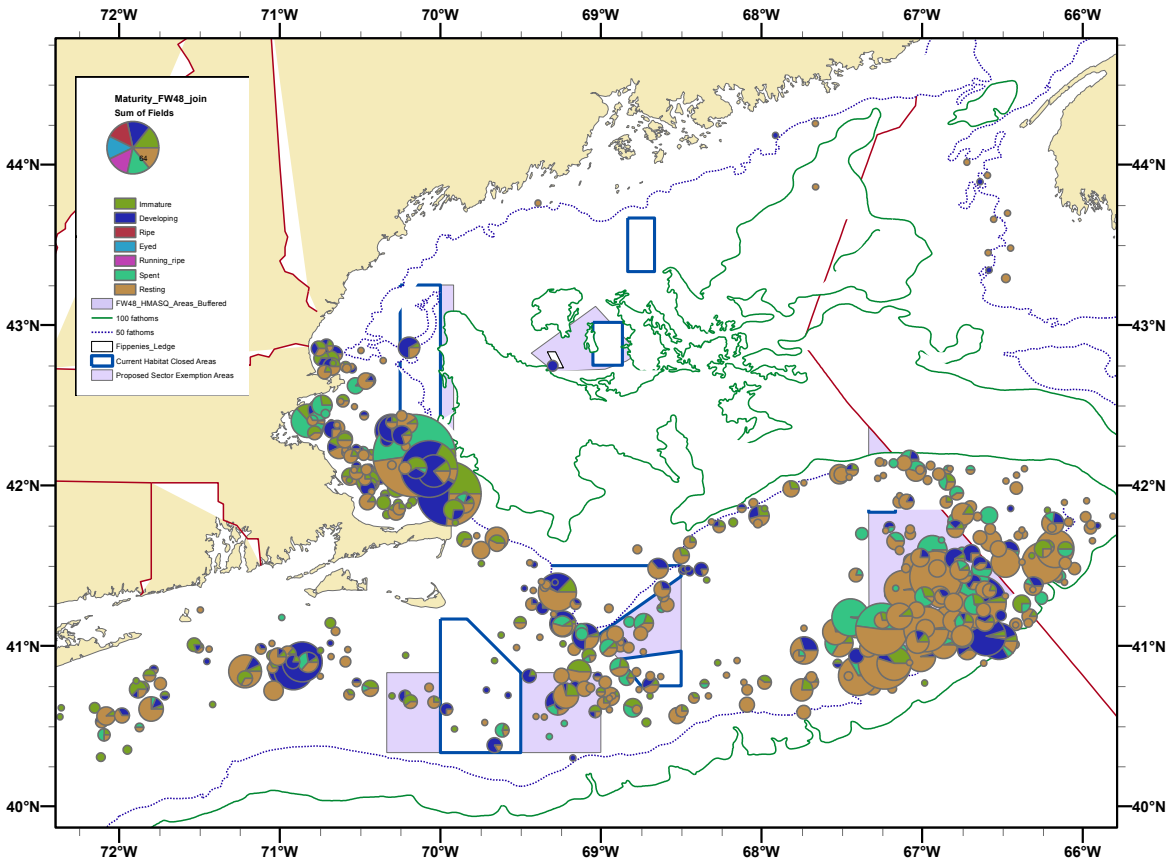
In the Gulf of Maine, most of the yellowtail flounder were developing, but more of the flunder were in ripe spawning condition in the open fishing areas (Figure 29). This diffierence is probably caused more by a timing issue than due to a spawning aggregation.

Figure 29. 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 30).

Figure 30. 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 31). There do not appear to be any areas where larger yellowtail flounder are congregating (Figure 32).

Figure 31. Yellowtail flounder distribution maps from survey tows

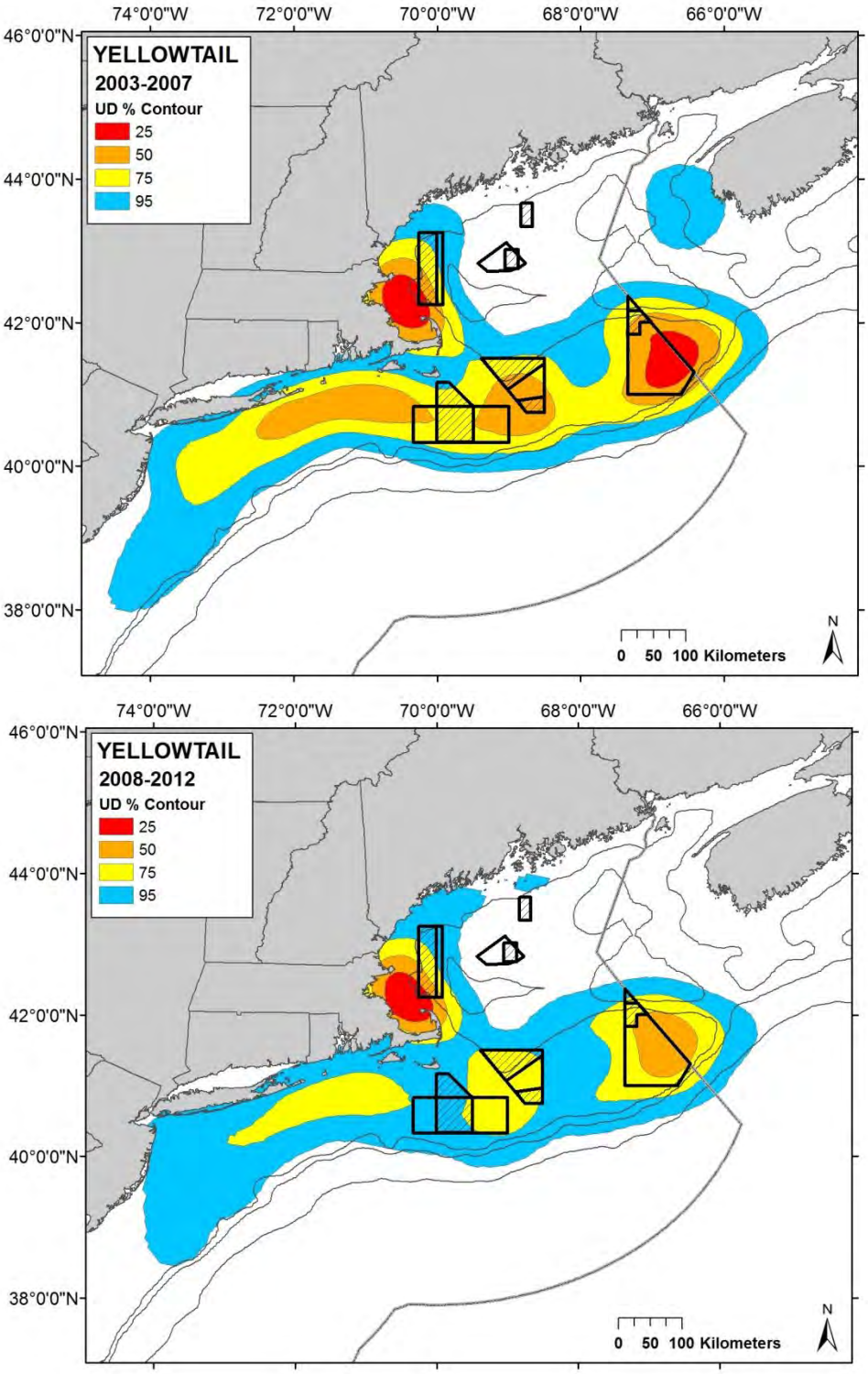
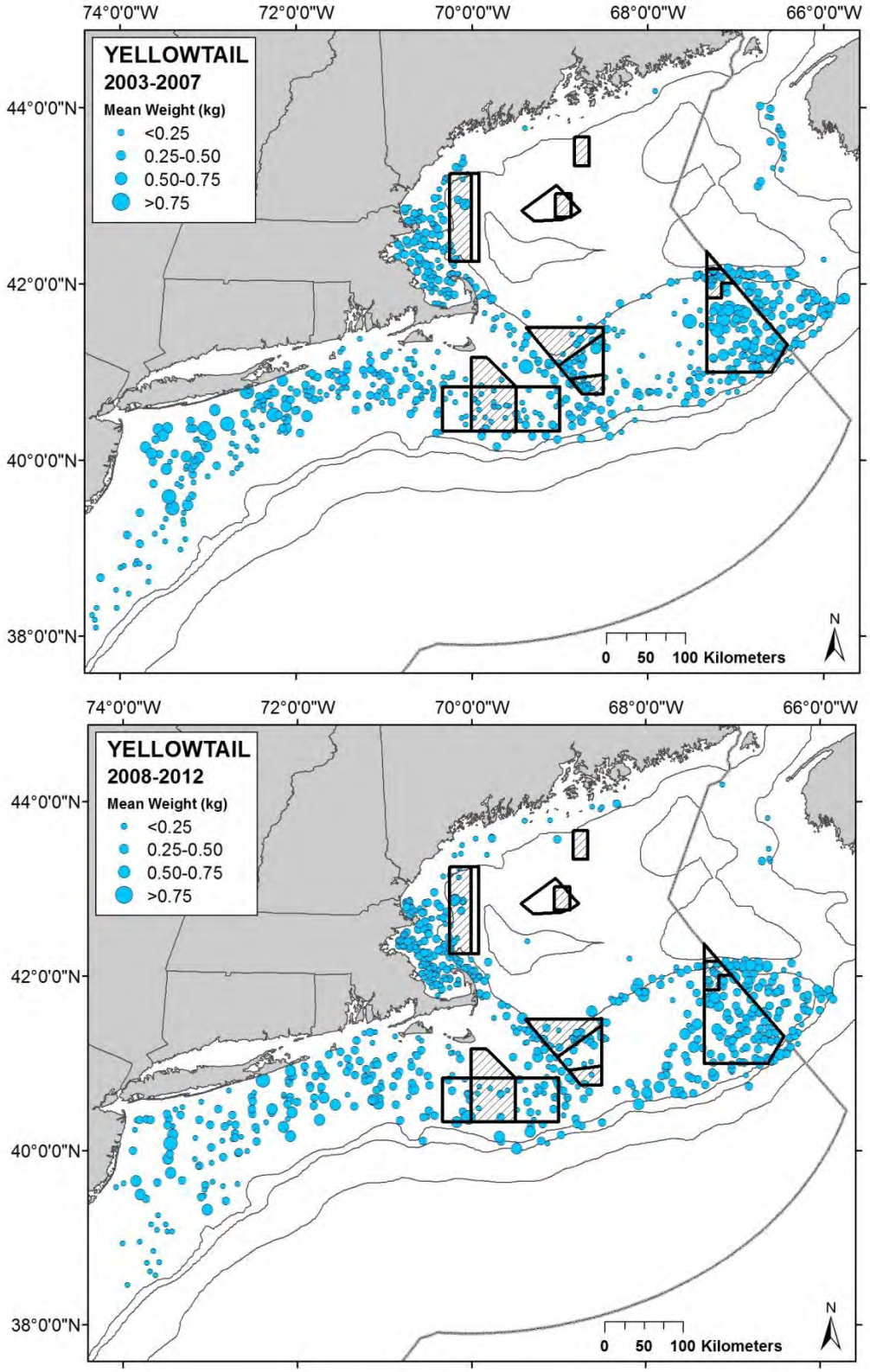


Figure 32. Yellowtail flounder mean weight per tow from survey tows



4.1.1.4.5 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 33) and fall (Figure 34) surveys.

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

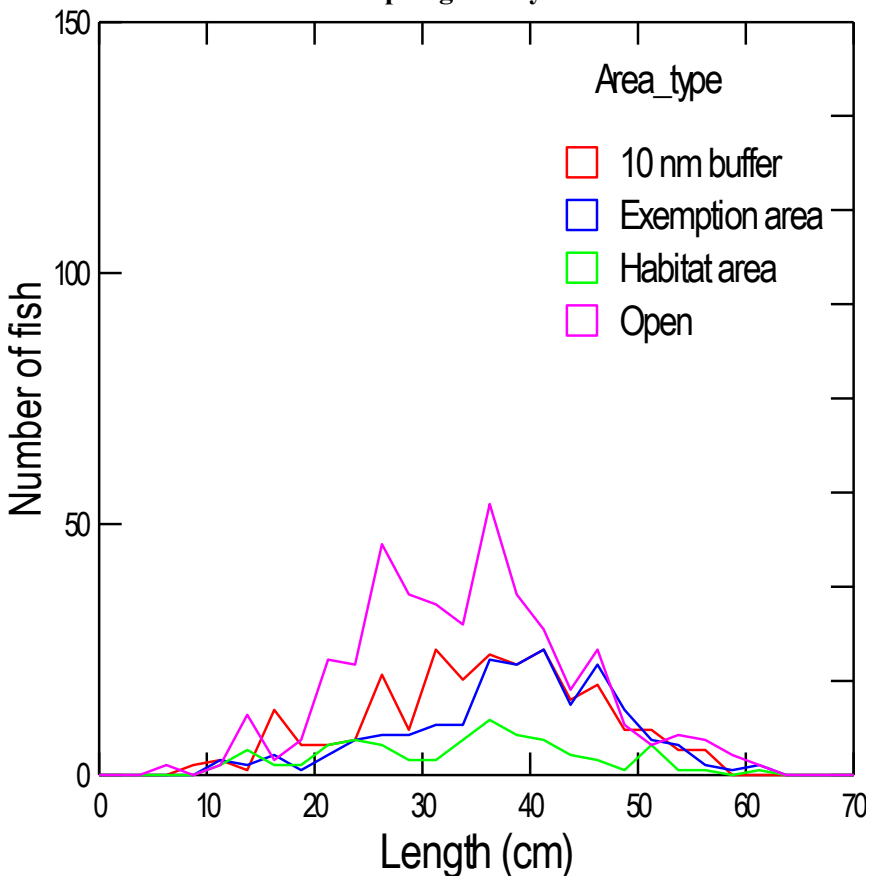
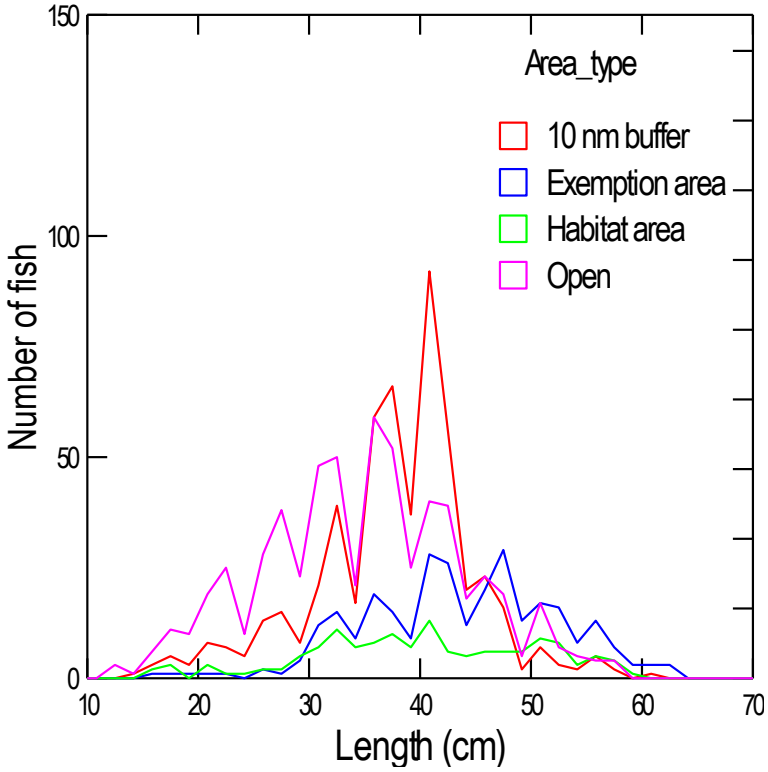


Figure 34. Comparative length frequencies of female Georges Bank winter flounder during 2002-2011 fall surveys



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 35). More developing winter flounder were observed in the fall survey (Figure 36). 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 35. Geographical distribution of female winter flounder maturity stages during the 2002-2012 spring trawl surveys.

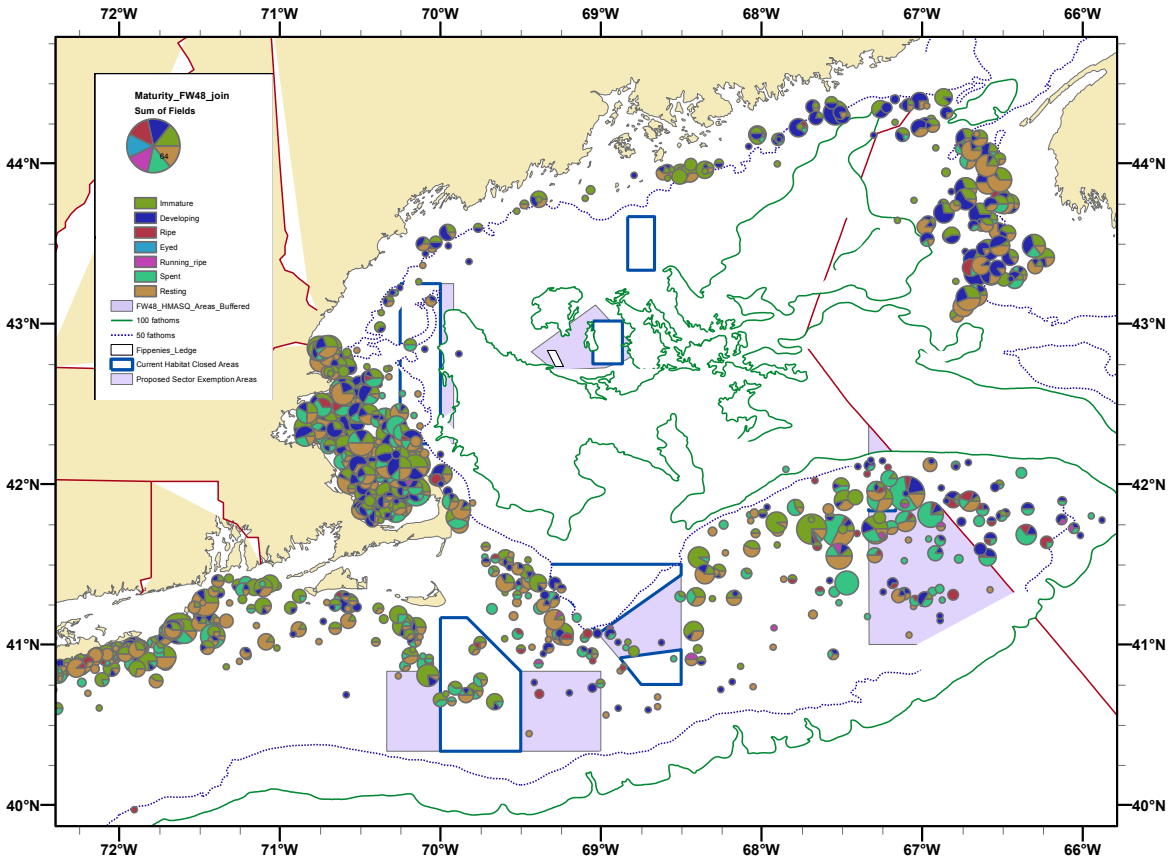
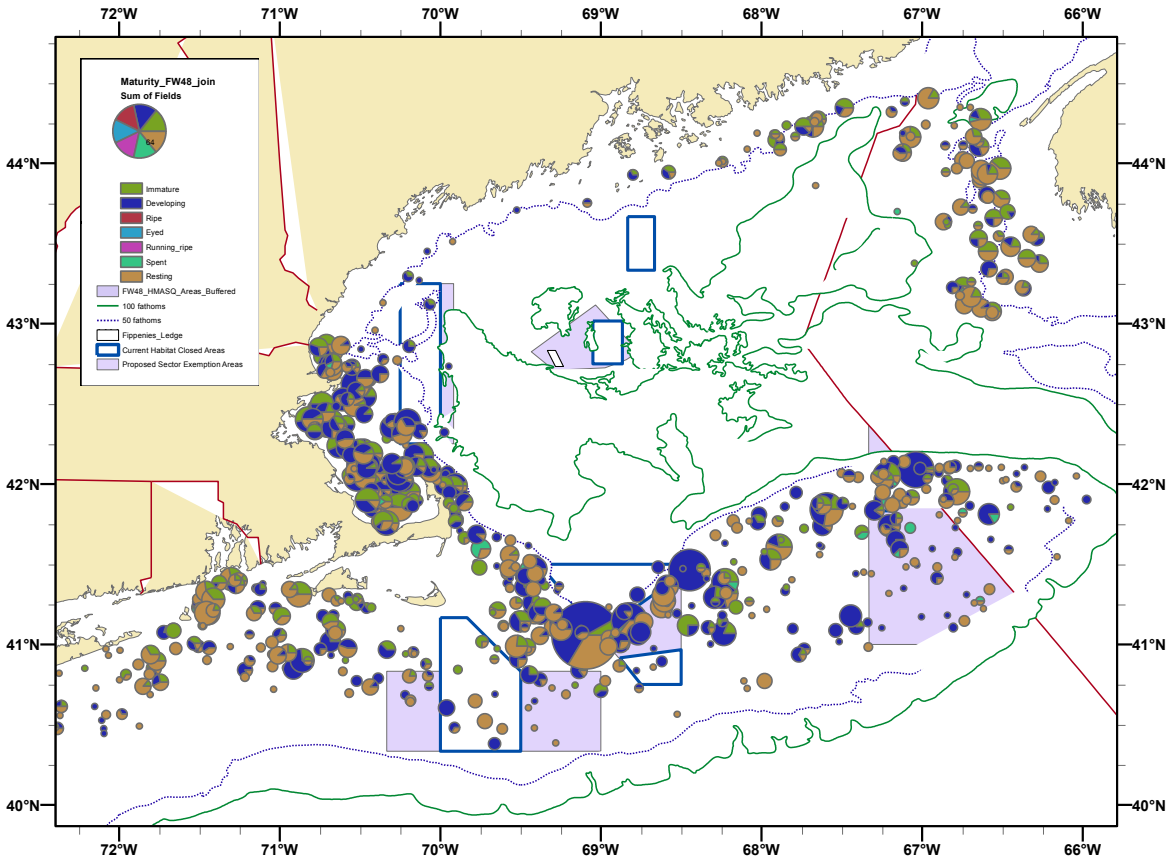
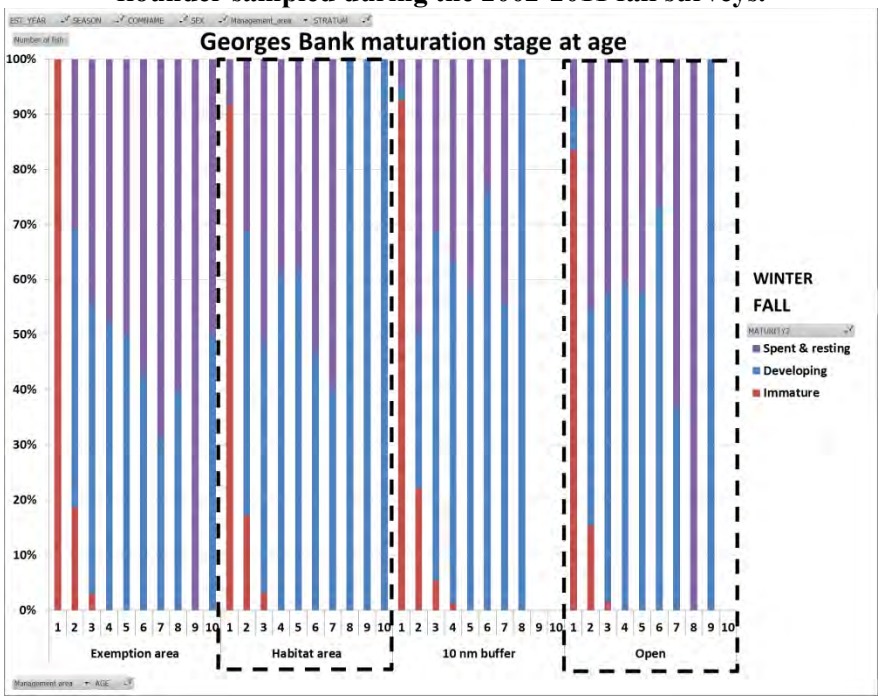


Figure 36. Geographical distribution of female winter flounder maturity stages during the 2002-2011 fall trawl surveys.



Differences of other biological characteristics among types of management areas were unremarkable. Length at ageand maturity at age (Figure 37) were similar among types of management areas in the spring and fall surveys.

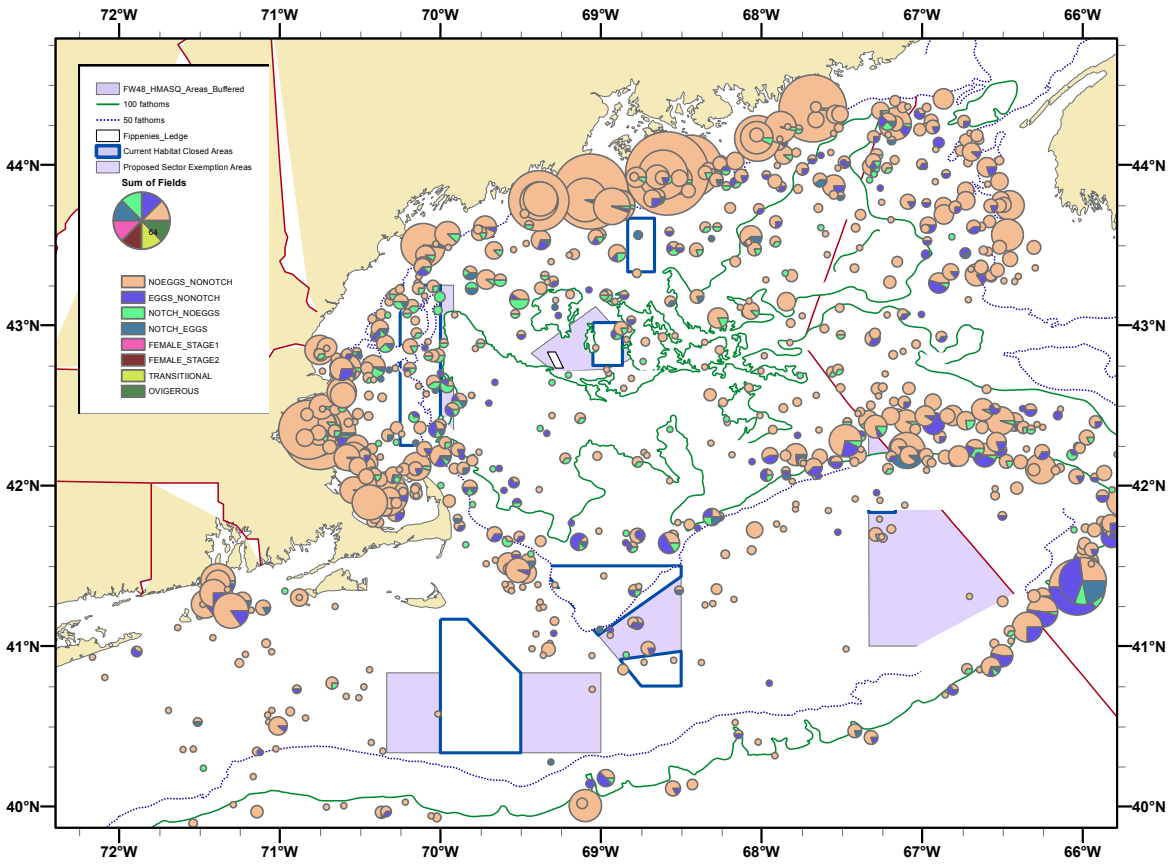
Figure 37. Proportion mature at age by type of management area for female Gulf of Maine winter flounder sampled during the 2002-2011 fall surveys.



4.1.1.4.6 American lobster

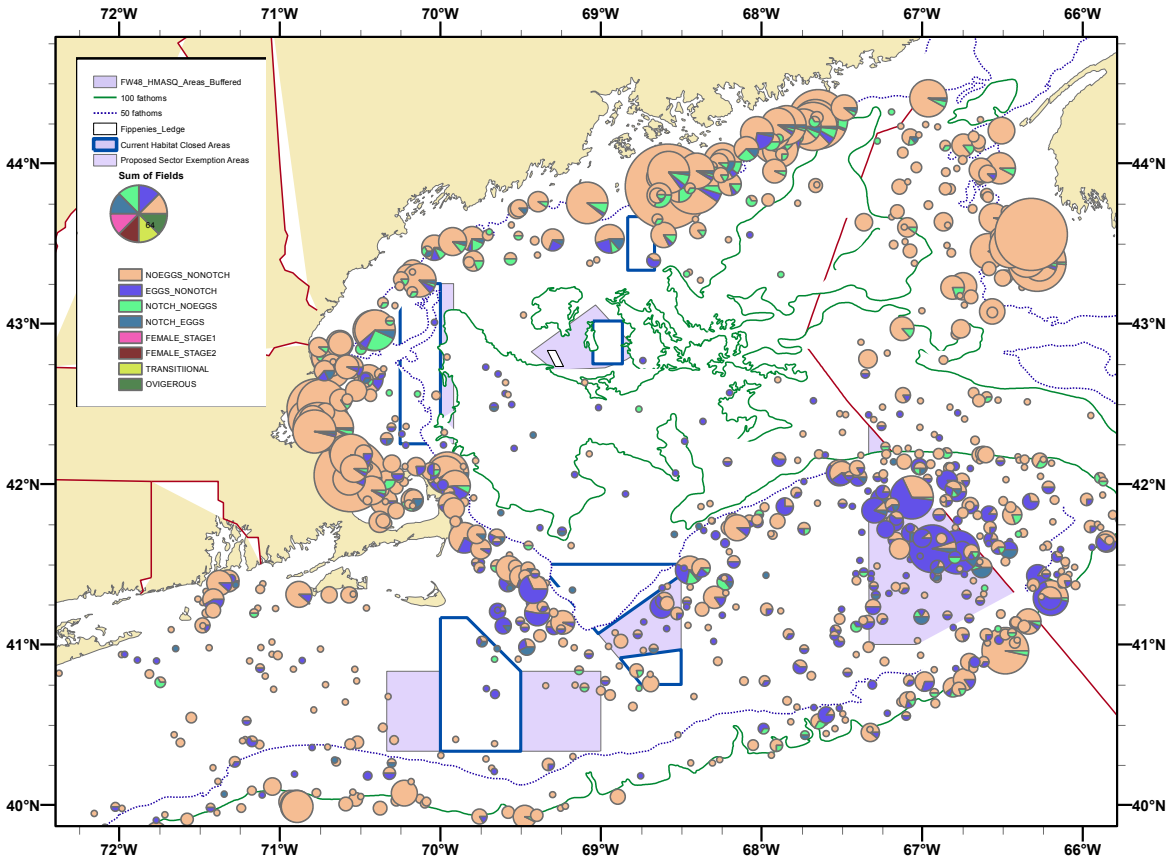
The spring survey caught American lobster around the Gulf of Maine coastline and around the deeper margins of Georges Bank (Figure 38). Relatively few female lobsters were caught in the proposed sector exemption and current habitat areas on Georges Bank. Most female lobsters were not egg-bearing and had no notches, with some egg-bearing fenales caught around the eastern edge of Georges Bank in Canada.

Figure 38. Geographical distribution of female lobster maturity stages during the 2002-2012 spring trawl surveys.



Female lobsters caught in the spring survey occurred around the coastline of the Gulf of Maine, but few were caught in either the Western Gulf of Maine or Cashes Ledge areas (Figure 39). Relatively more egg-bearing lobsters were caught in the Great South Channel, and in the proposed sector exemption areas of Closed Area I and Closed Area II.

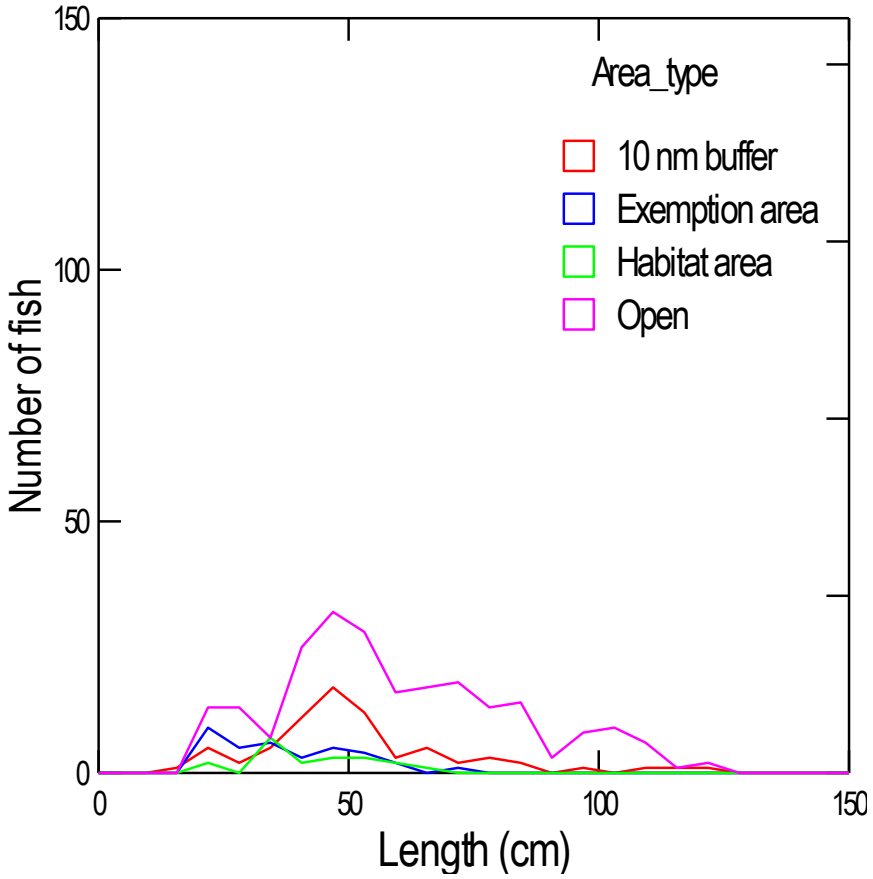
Figure 39. Geographical distribution of female lobster maturity stages during the 2002-2011 fall trawl surveys.



4.1.1.4.7 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 40) and fall surveys.

Figure 40. 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 41). 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 42). The smaller barndoor skate occurred in the shallower depths found within the Closed Area I and Closed Area II proposed sector exemption areas.

Figure 41. Geographical distribution of barndoor skate length frequency during 2002-2012 spring surveys.

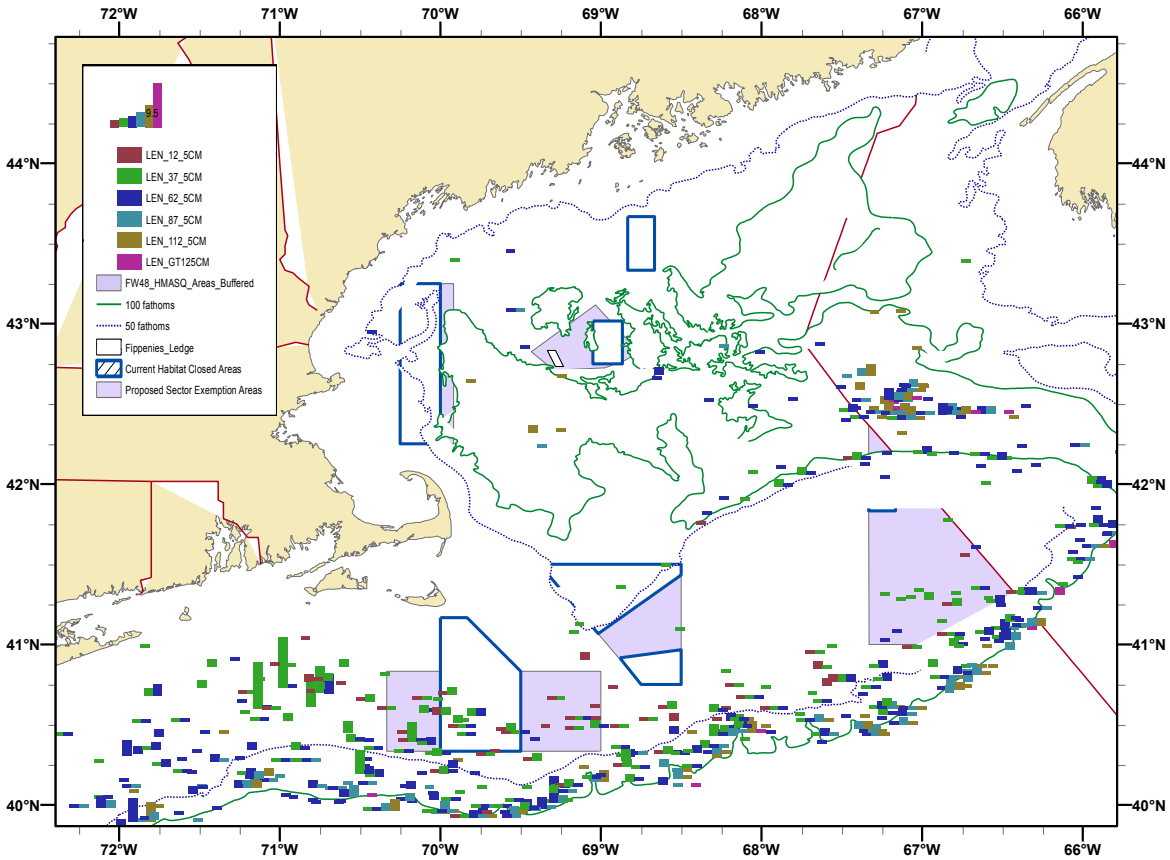
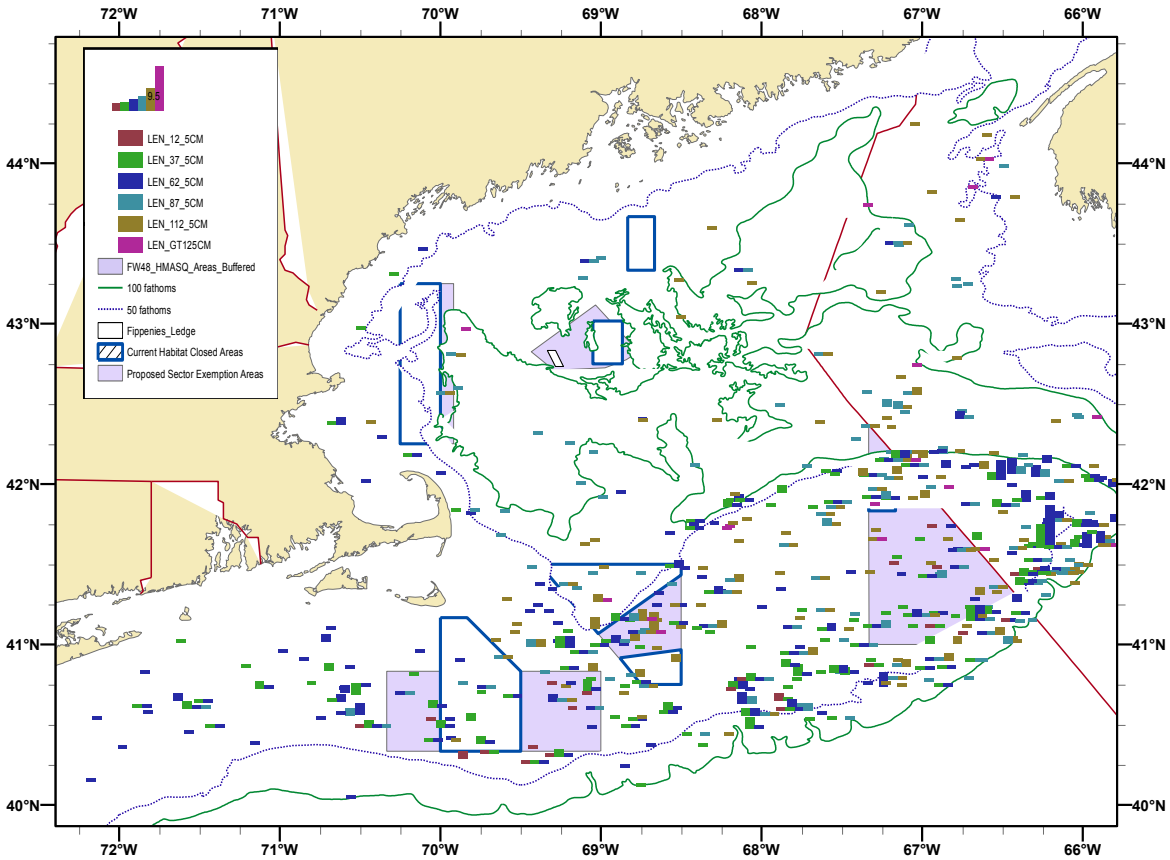
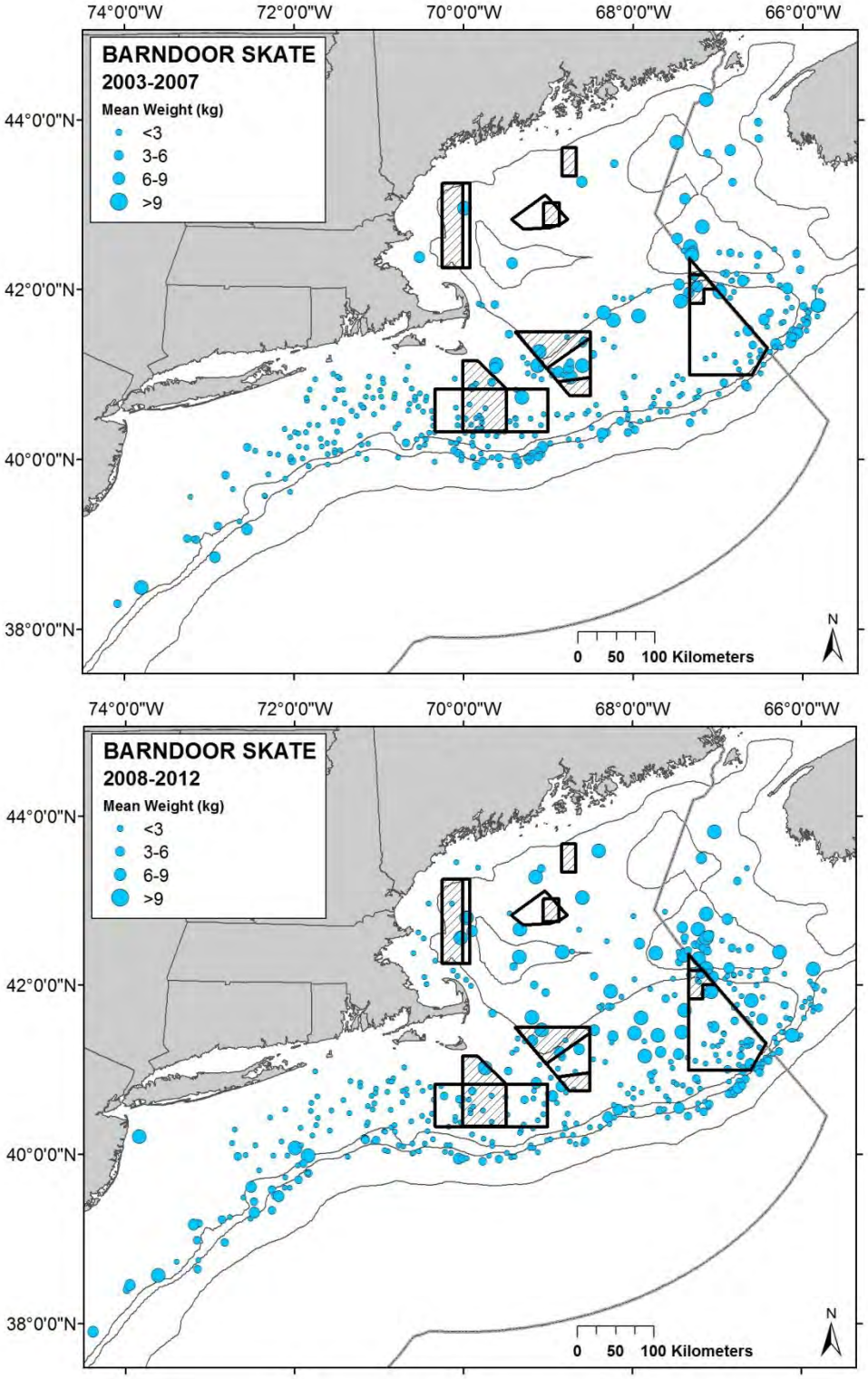


Figure 42. Geographical distribution of barndoor skate length frequency during 2002-2011 fall surveys.



The analysis for mean weight per tow for barndoor skate indicate that most barndoor skates are found on Georges Bank (Figure 43). 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.

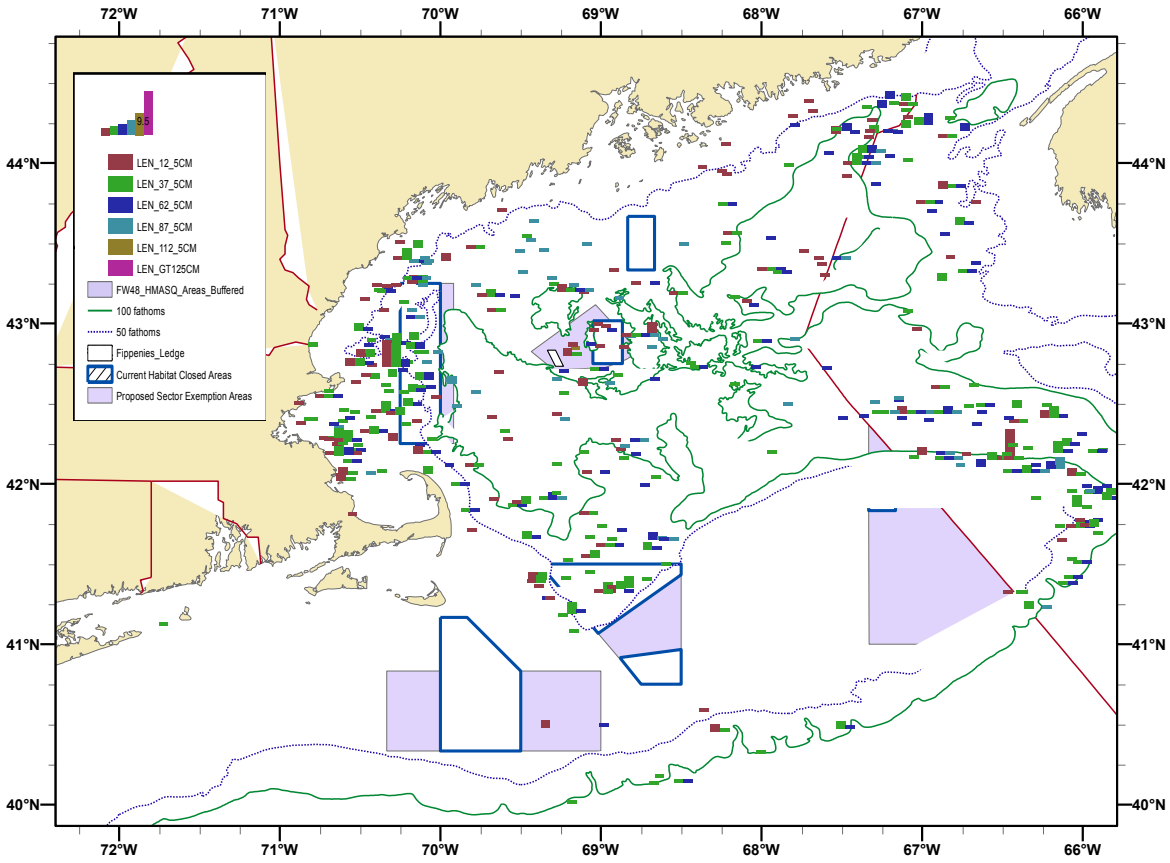
Figure 43. Barndoor skate mean weight per tow from survey tows



4.1.1.4.8 Thorny skate

Thorny skate were caught in the spring (Figure 44) and fall surveys throughout the Gulf of Maine and the northern and eastern margin of Georges Bank. Relatively few thorny skate were caught in the proposed sector exemption areas on Georges Bank. In the Gulf of Maine more thorny skate were caught in shallower areas than in the deep basins, areas which overlap the Western Gulf of Maine habitat area of the proposed sector exemption area of Cashes Ledge. Smaller thorny skate were observed on Stellwagen Bank and Jeffries Ledge, with larger thorny skate caught in the spring in the Western Gulf of Maine habitat area. The spring and fall surveys caught no thorny skate in the Western Gulf of Maine proposed sector exemption area. Small thorny skate (i.e < 25 cm) were caught in the Cashes Ledge proposed sector exemption area.

Figure 44. Geographical distribution of thorny skate length frequency during 2002-2012 spring surveys.



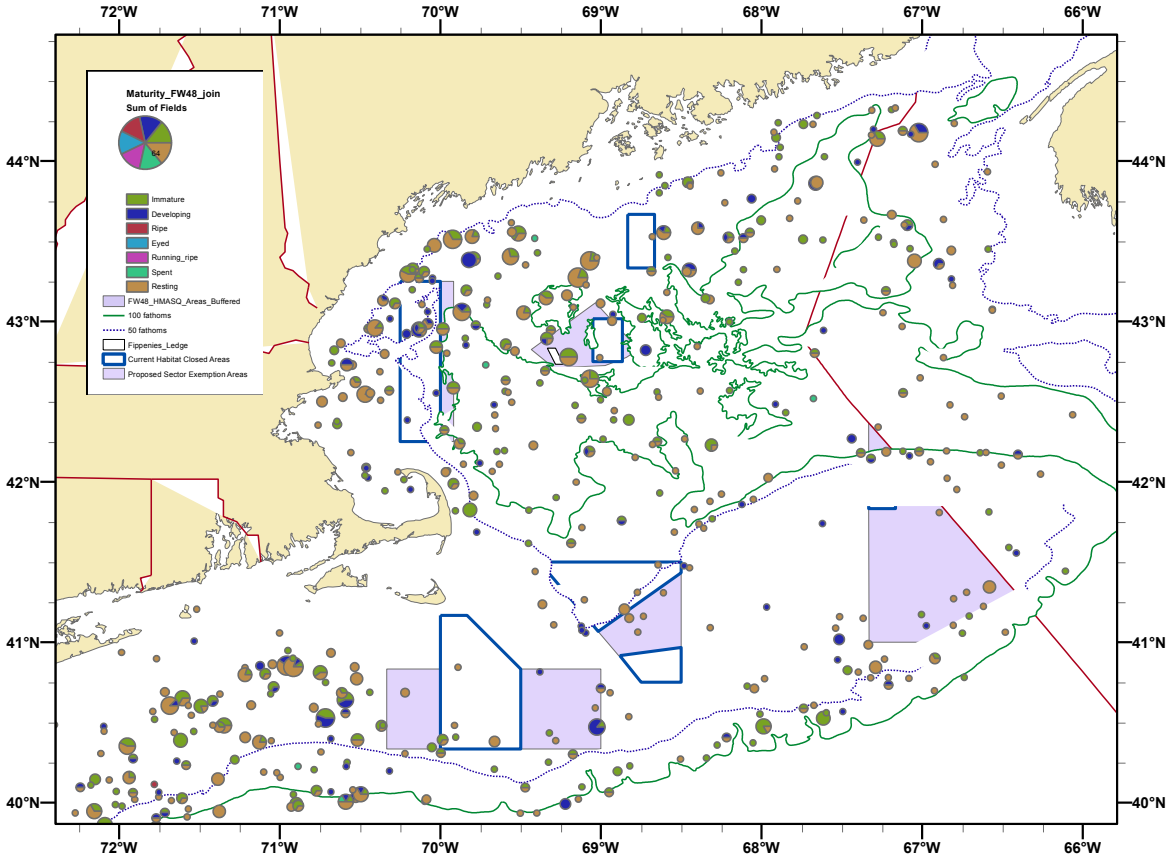
4.1.1.4.9 Smooth Skate

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.

4.1.1.4.10 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 45) and winter surveys, but most of the monkfish occur in open fishing areas.

Figure 45. 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 47). There were larger monkfish present in the closed areas, but it does not appear to be substantially more than in the open areas (Figure 48).

Figure 46. Geographical distribution of female monkfish maturity stages during the 2002-2011 fall trawl surveys.

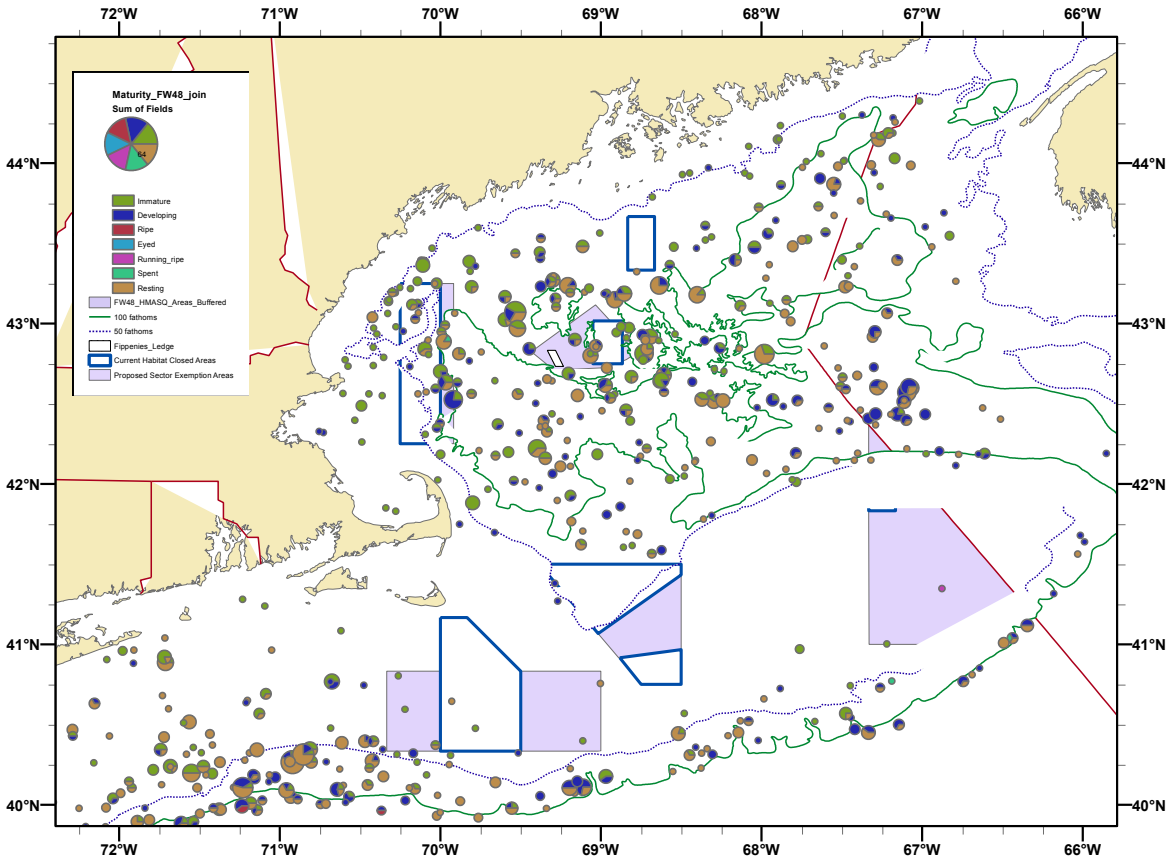


Figure 47. Monkfish distribution maps from survey tows

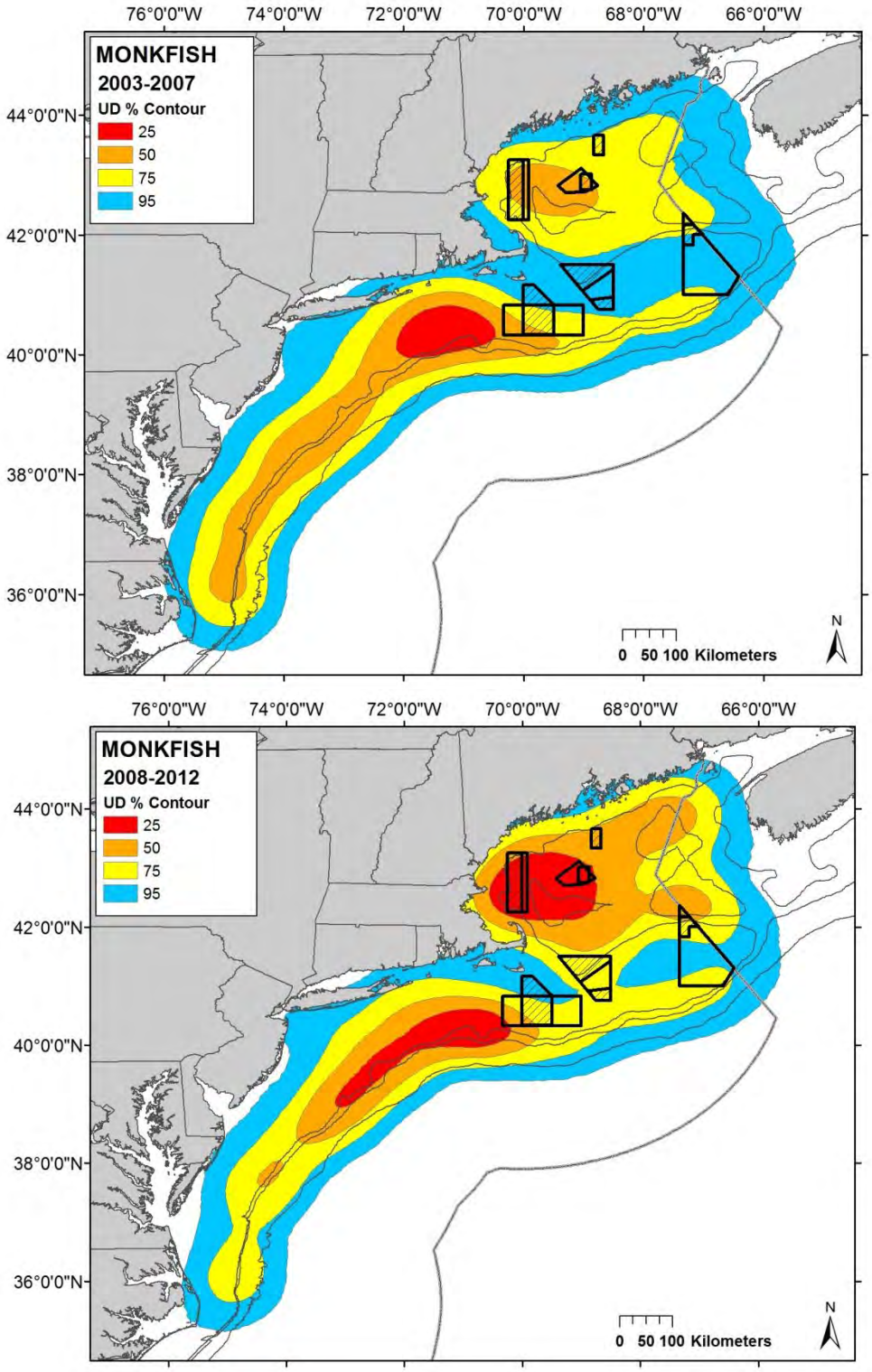
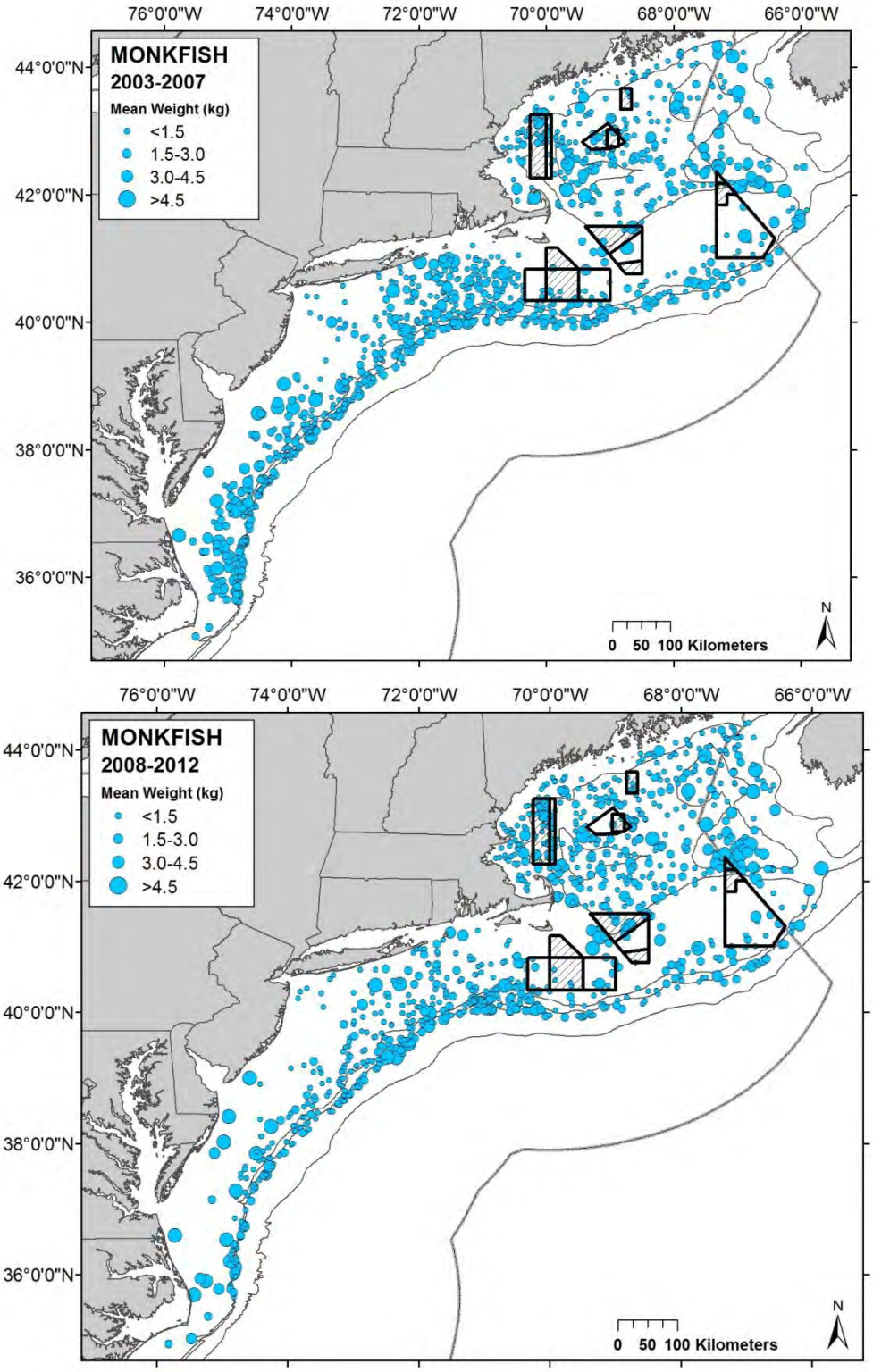


Figure 48. Monkfish mean weight per tow from survey tows



4.1.1.4.11 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 49). 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 50). 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 49. Geographical distribution of white hake length frequency during 2002-2012 spring surveys.

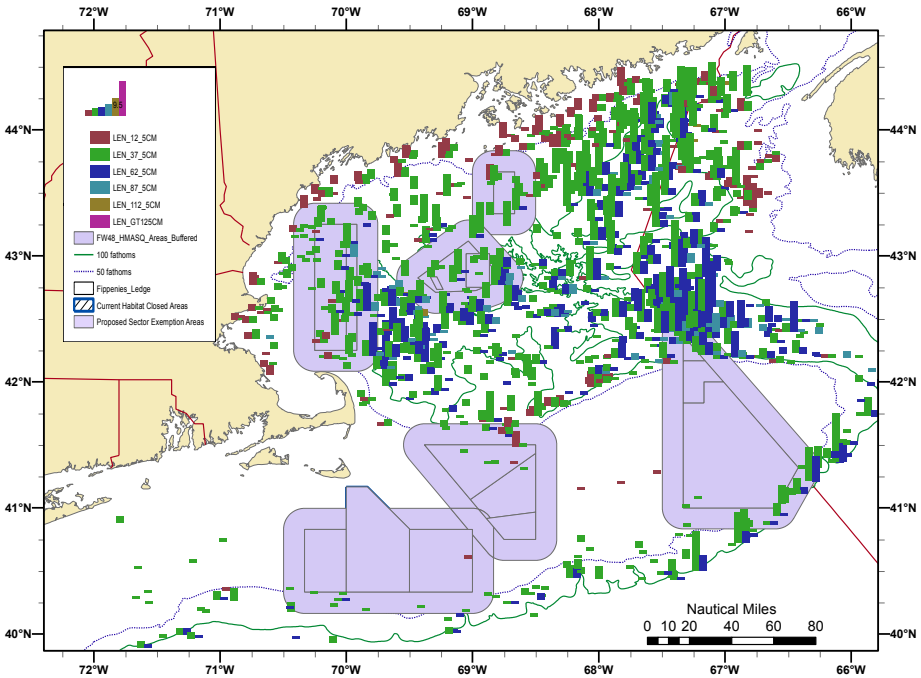
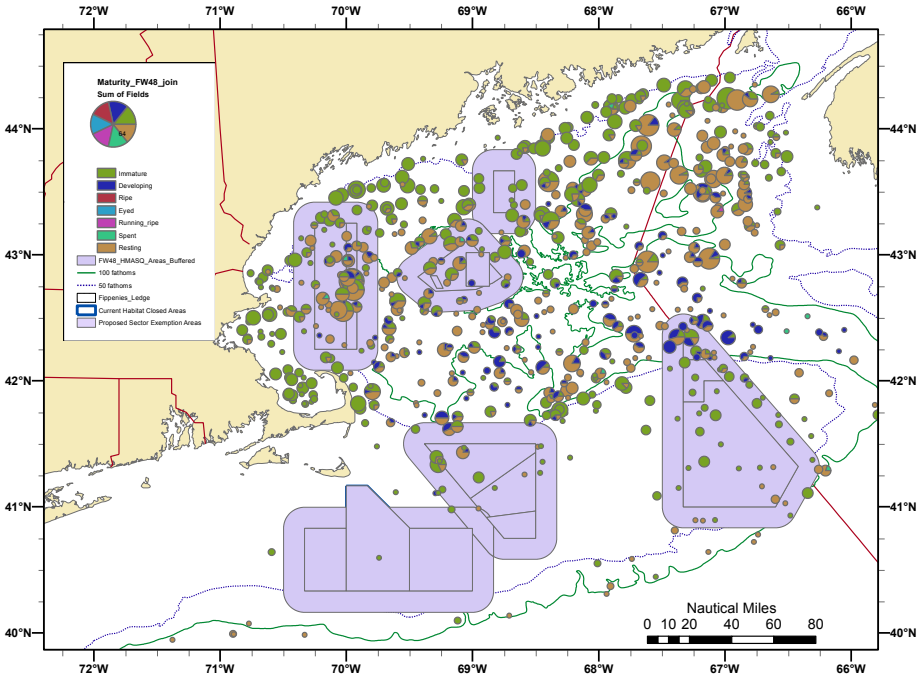


Figure 50. Geographical distribution of white hake maturity stage during 2002-2011 fall surveys.



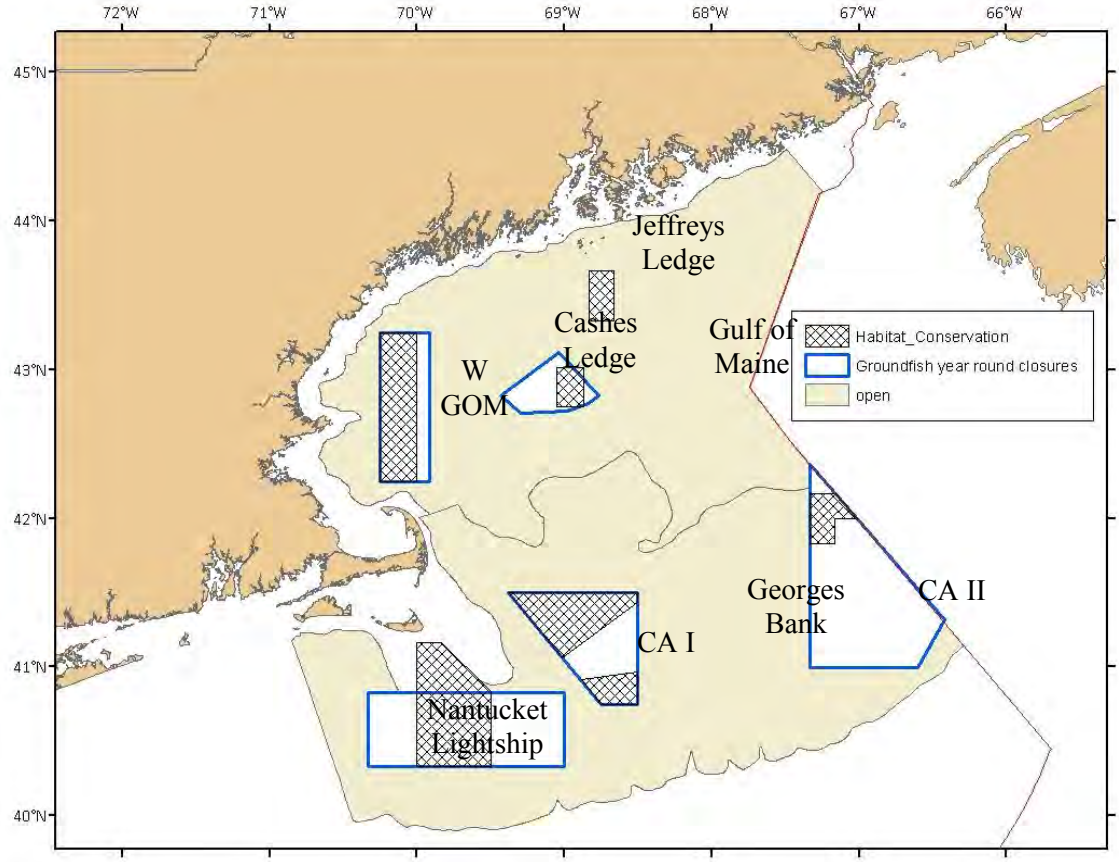
4.1.2 Swept Area Indices and Propoportion of Biomass Inside and Outside of Closed Areas

4.1.2.1 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 51. 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. $$B = \frac{I}{q} \quad \frac{A}{a}$$

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:

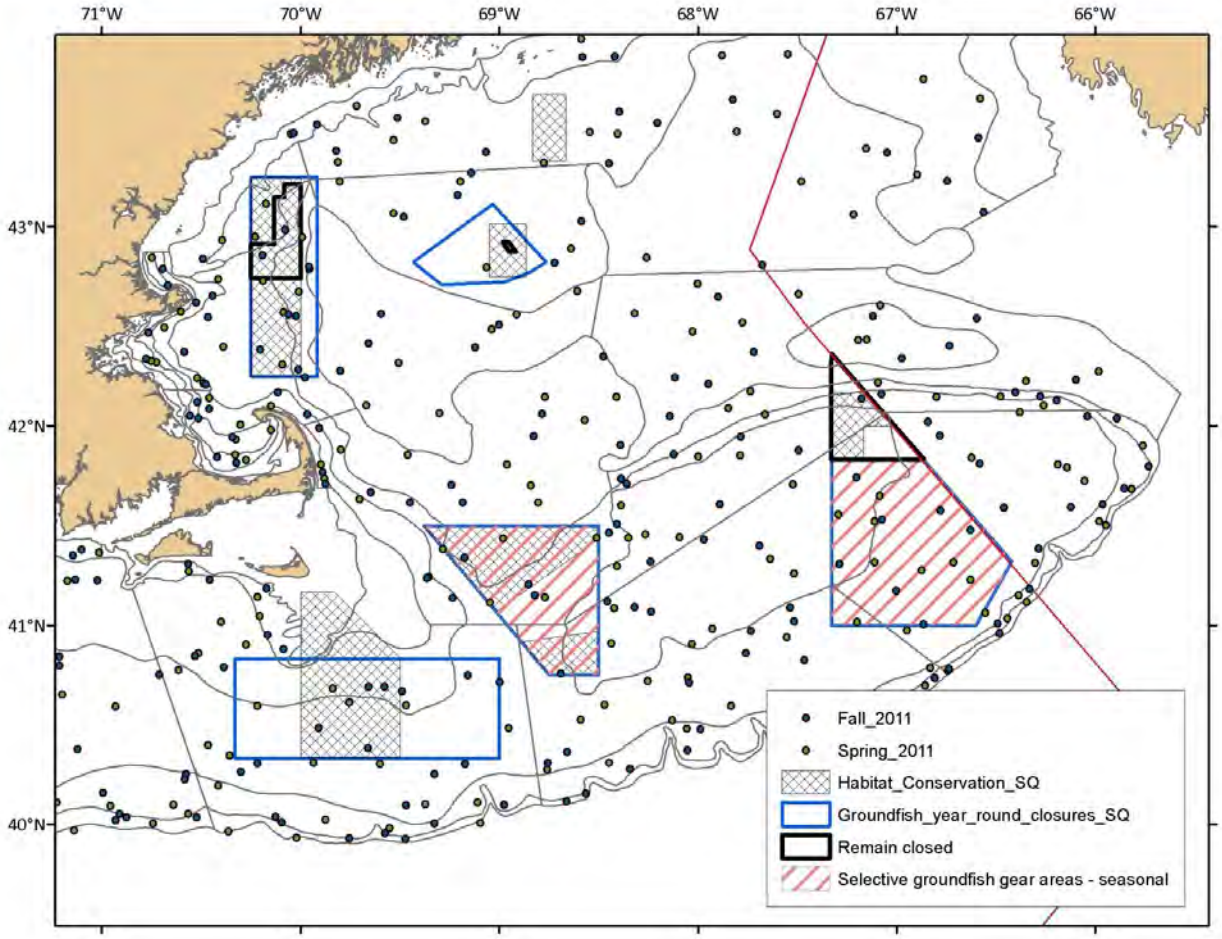
Name	Area (km^2)	A/a
Cashes Ledge CA	1373.07	35757.03
Closed Area I	3938.98	102577.60
Closed Area II	6862.19	178702.86
Nantucket Lightship CA	6247.79	162702.86
Western Gulf of Maine CA	3029.63	78896.61
CAI North	1937.35	50451.82
CAI South	583.68	15200.00
CAII Hab	641.44	16704.17
Cashes Ledge Hab	443.34	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.

4.1.2.2 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 52. 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 5. 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

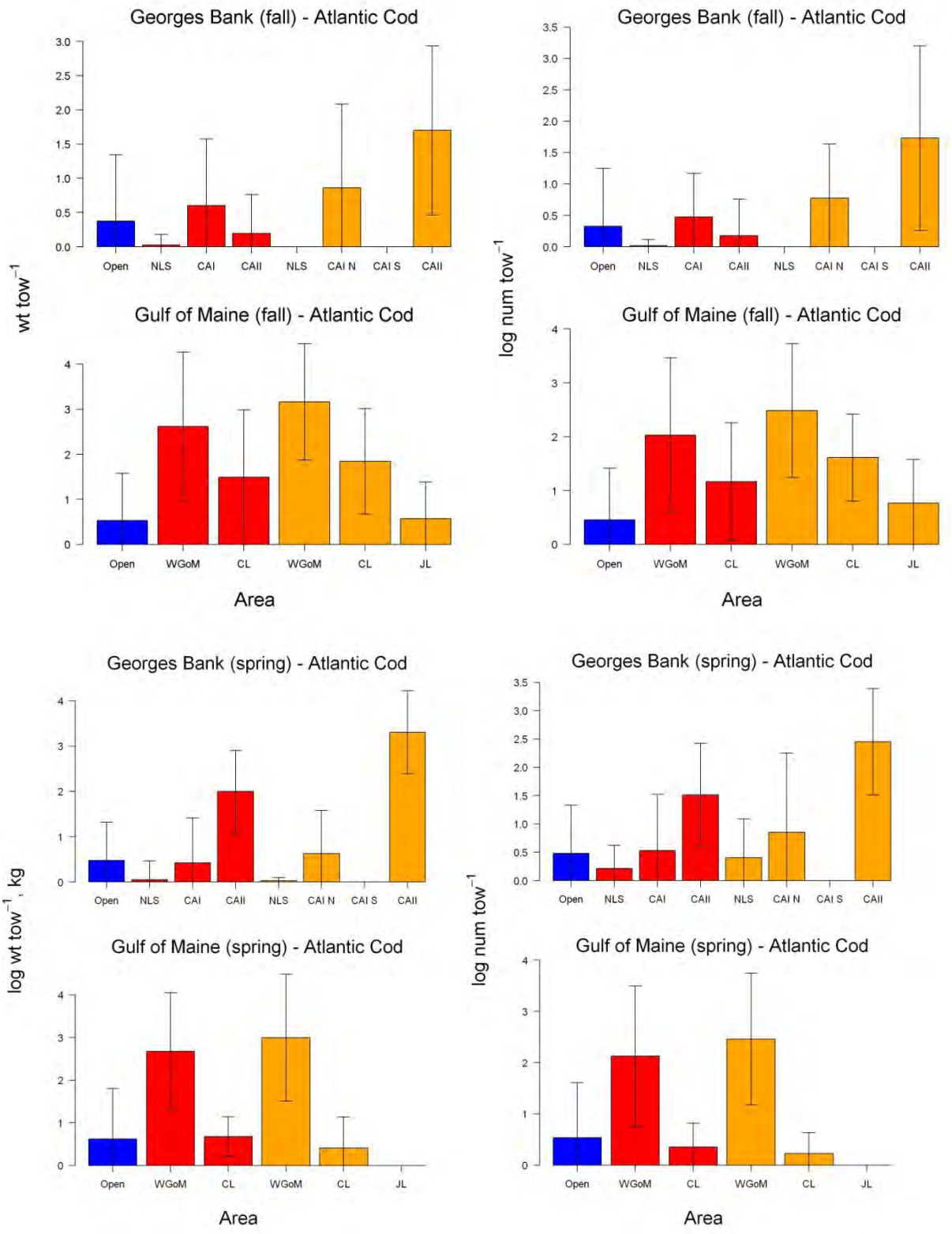
NEFSC survey CPUE in terms of mean biomass (kg/tow) and abundance (number/tow) indices were often higher in closed areas than open, although variance was high, particularly in smaller closed areas and habitat areas. Blue bars represent open areas, red bars represent closed areas and orange bars represent 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).

4.1.2.3 Conclusions

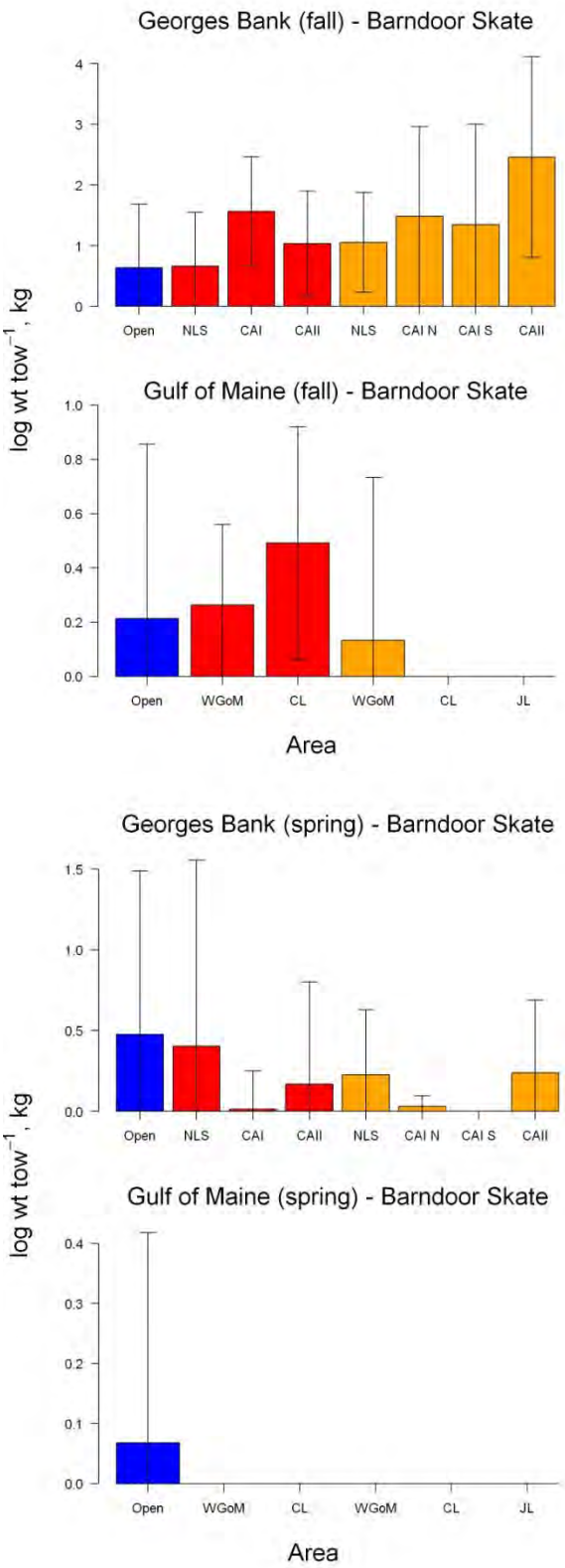
In general, the large variance in the analyses make it difficult to make any type of conclusions with confidence. There are, however, a few substantial differences that are worth noting. Georges Bank cod, Haddock, and Georges Bank yellowtail flounder are all found in much greater quantities in Closed 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 53. Mean Biomass CPUE Index and Abundance CPUE Index 2005-2011

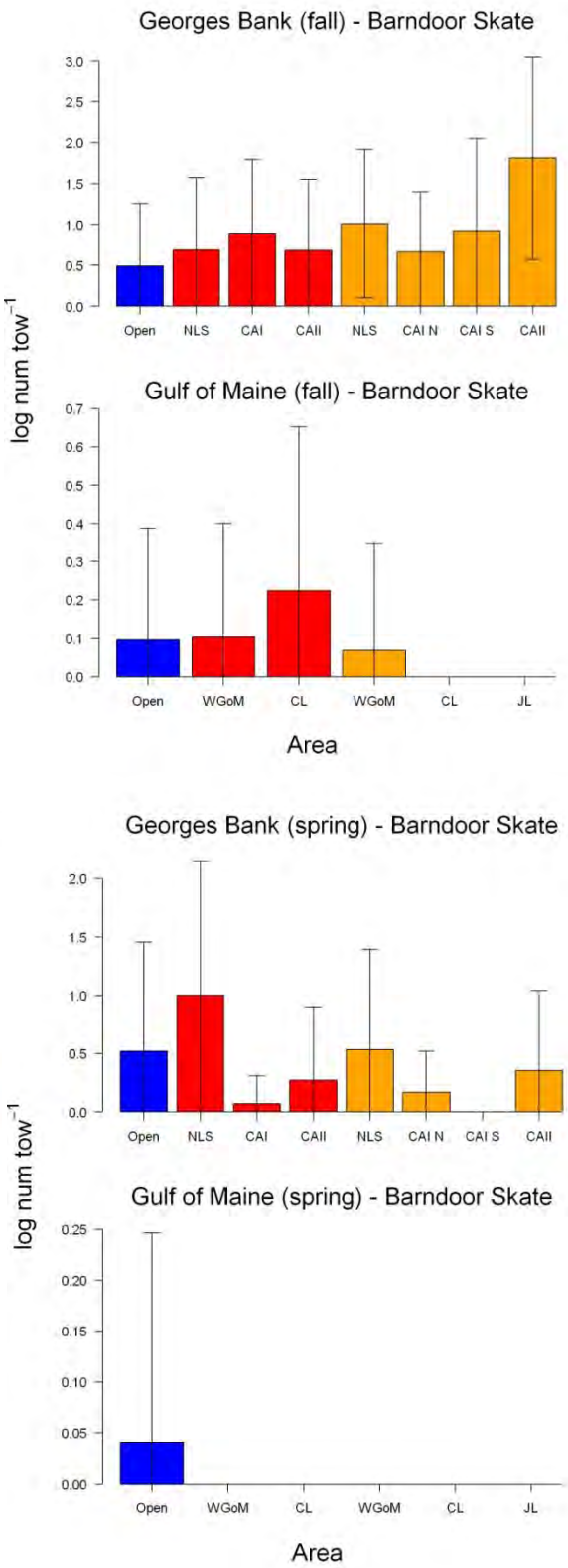
Mean Biomass CPUE Index 2005-2011 Mean Abundance CPUE Index 2005-2011



Mean Biomass CPUE Index 2005-2011



Mean Abundance CPUE Index 2005-2011



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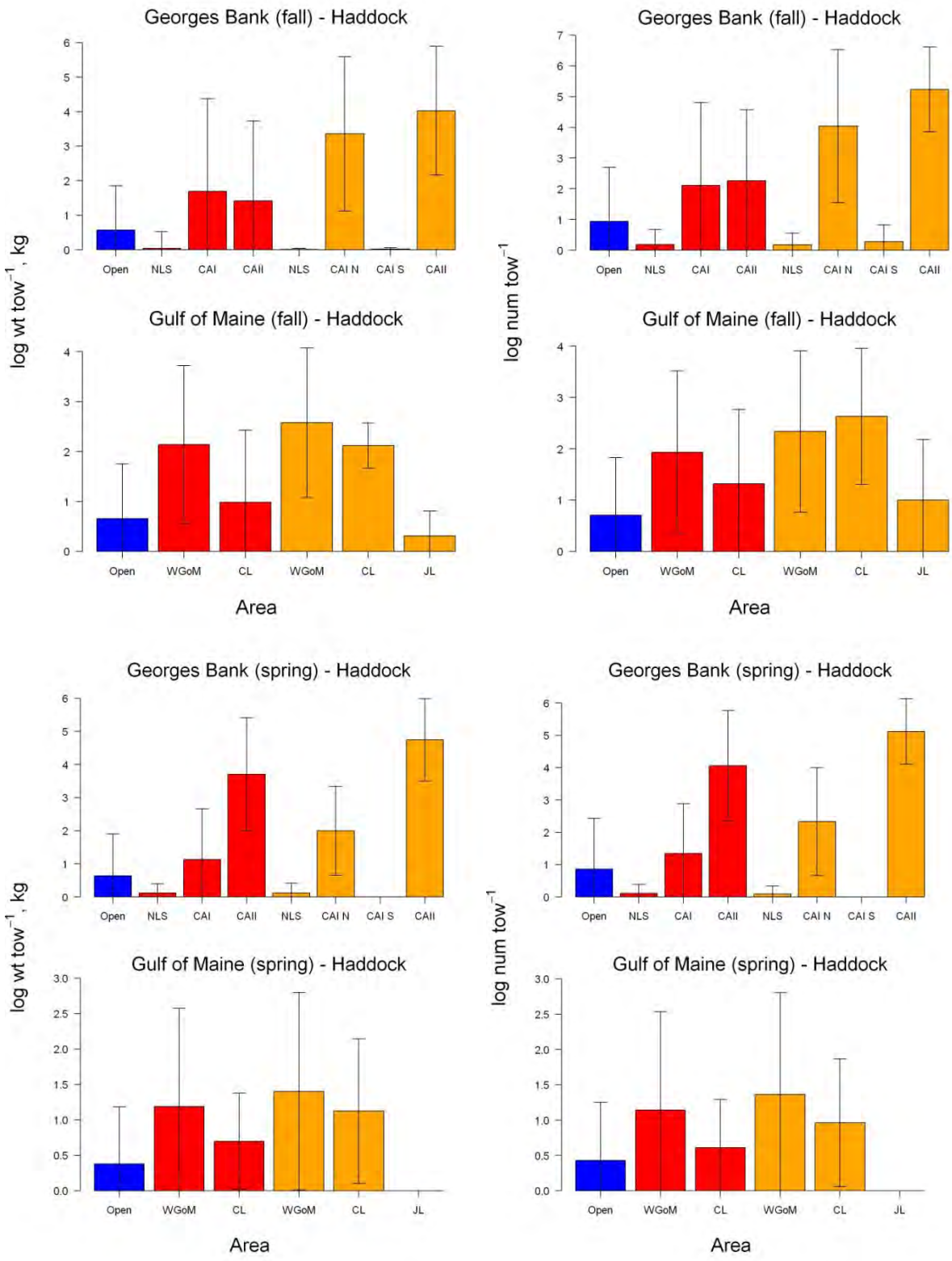

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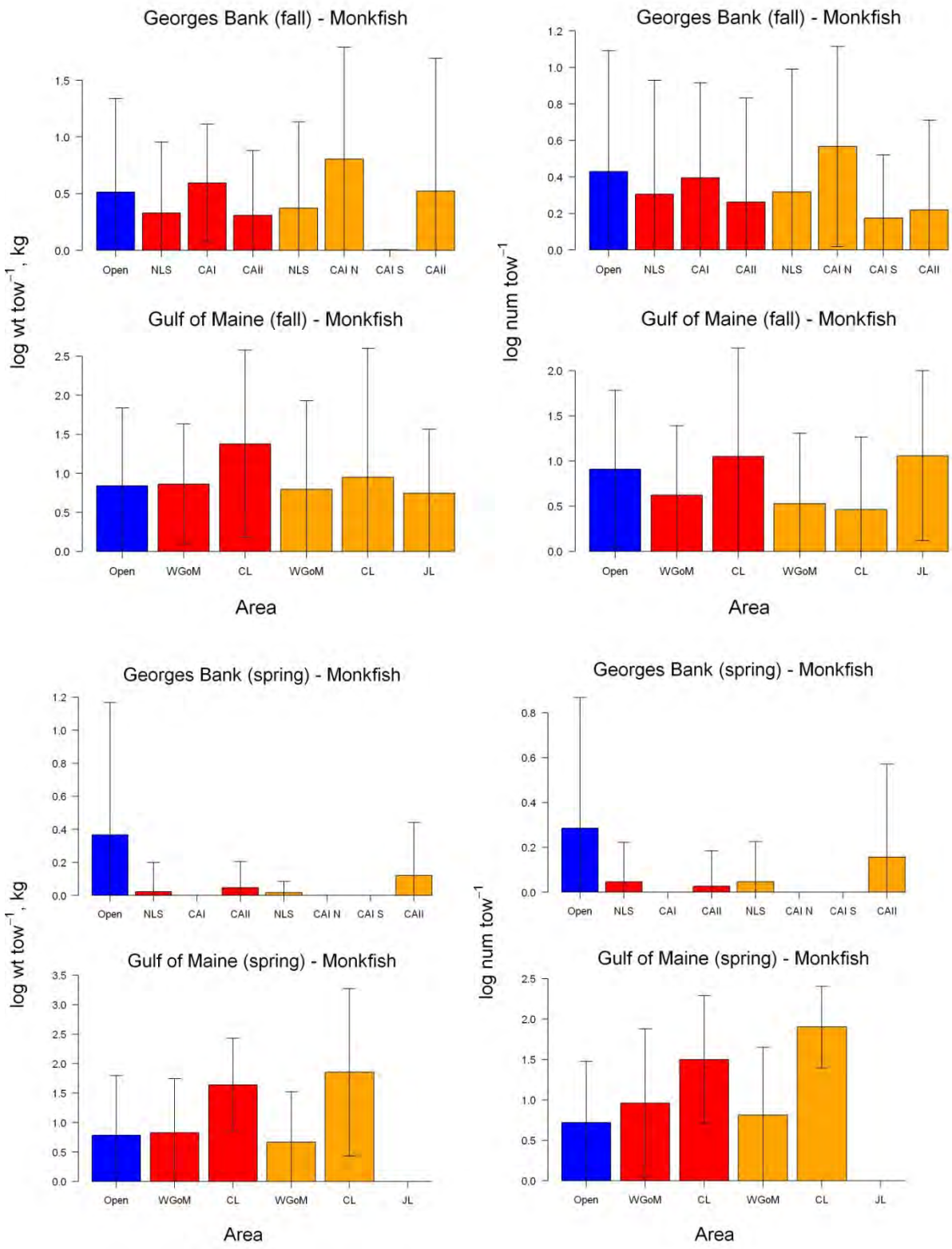
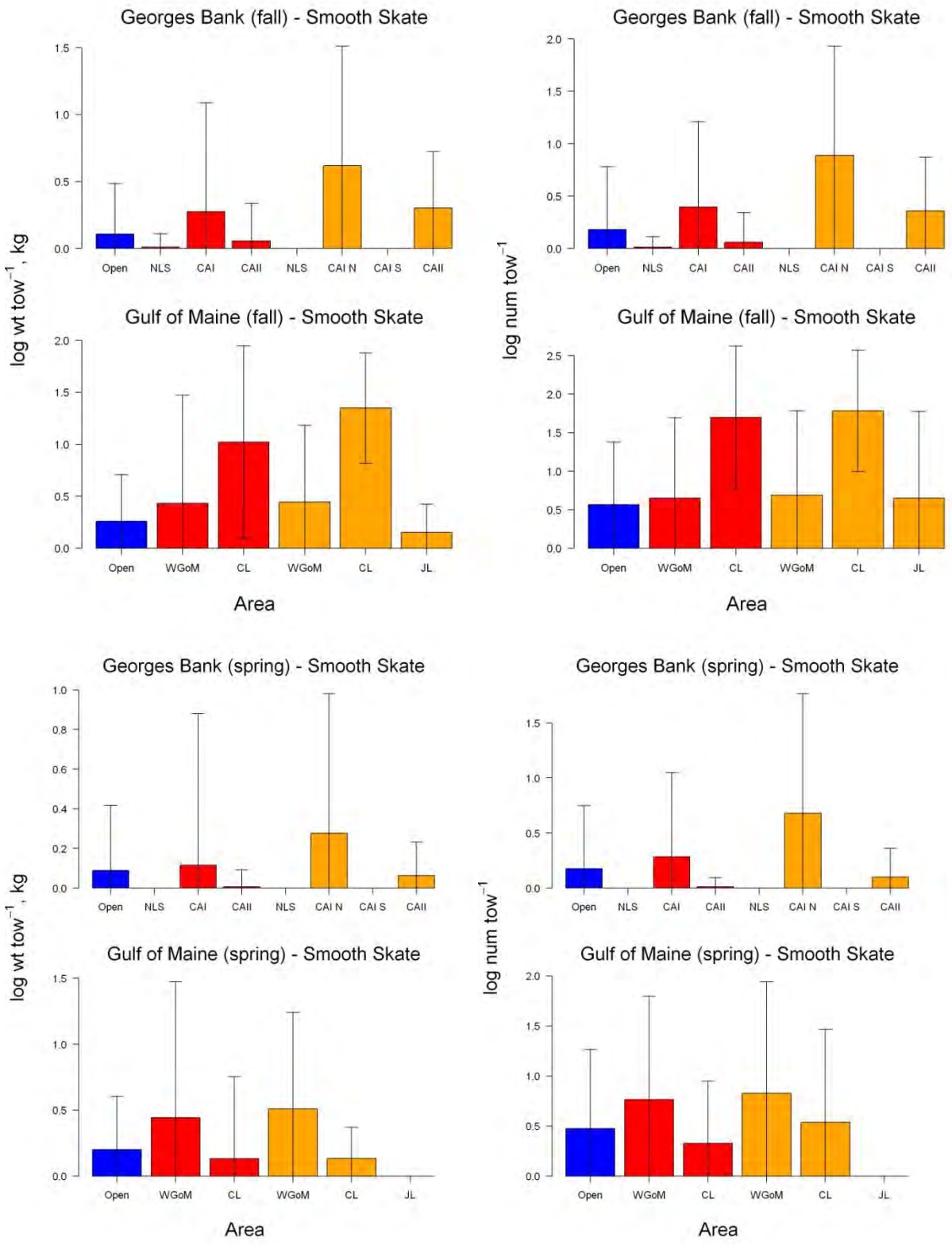
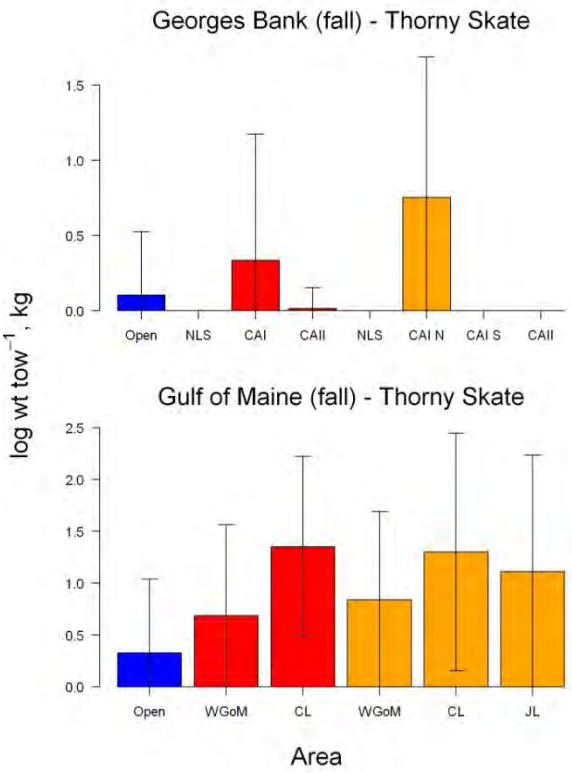
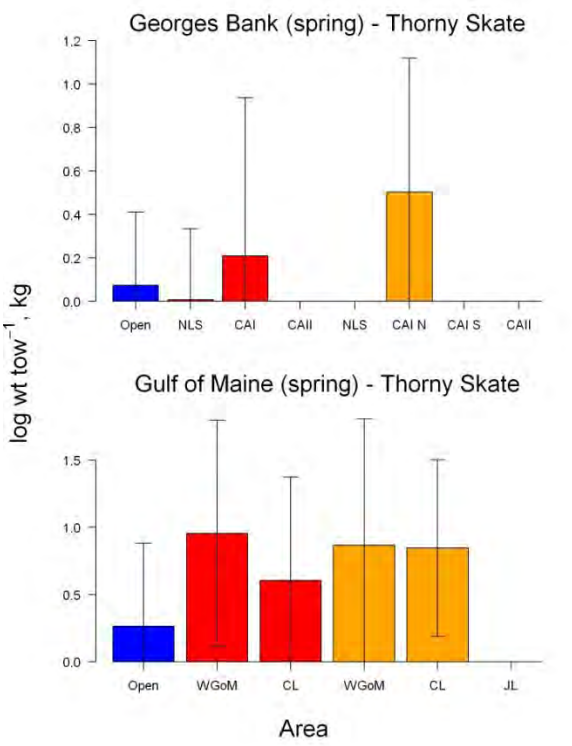


Mean Biomass CPUE Index 2005-2011 Mean Abundance CPUE Index 2005-2011

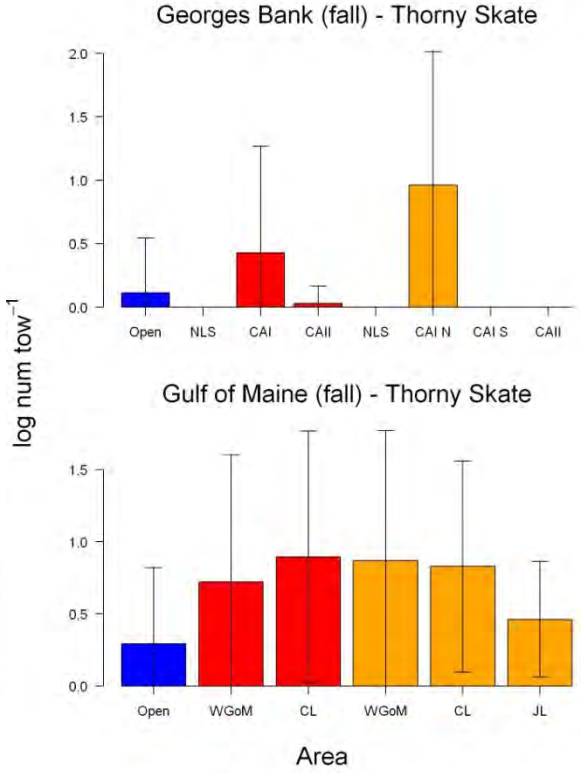


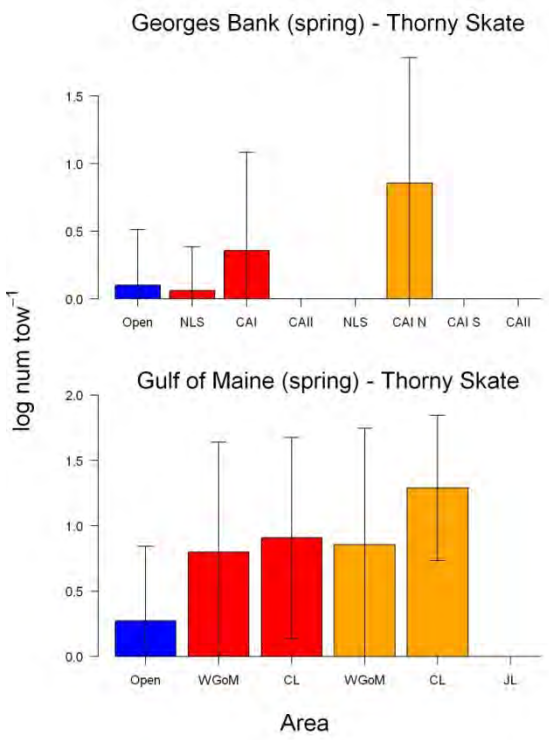
Mean Biomass CPUE Index 2005-2011



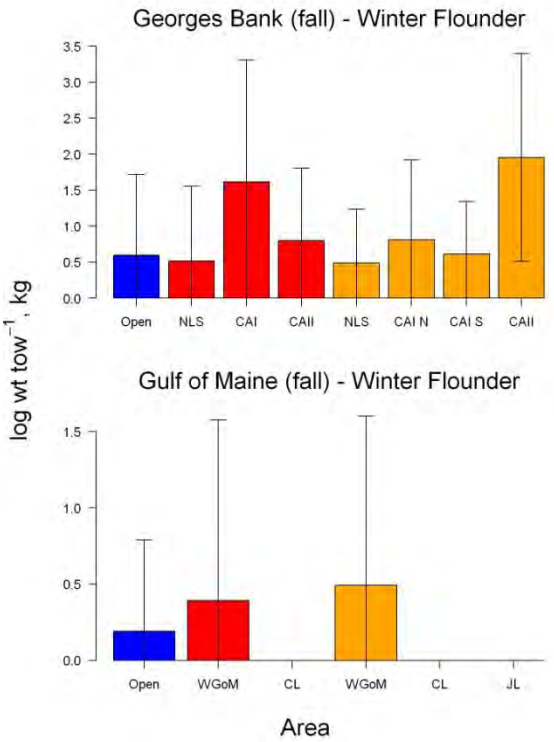


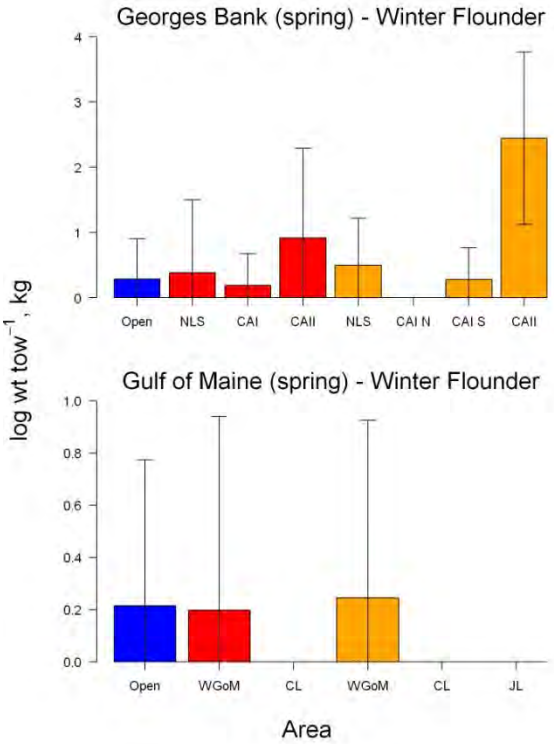
Mean Abundance CPUE Index 2005-2011



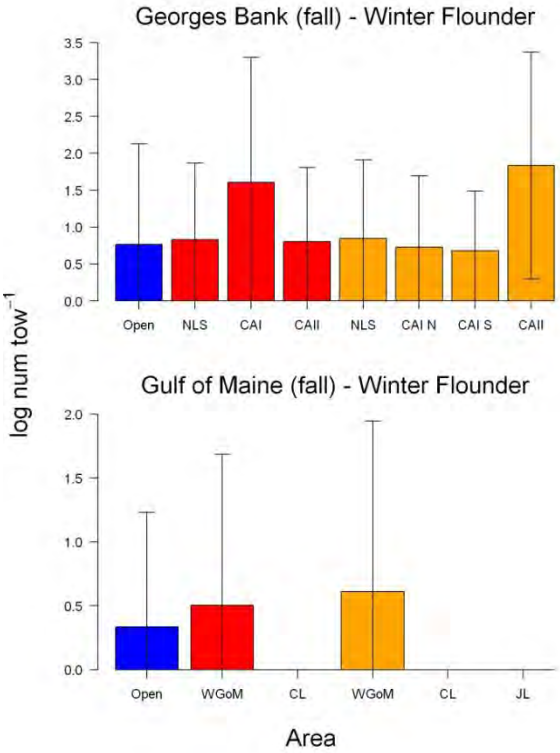


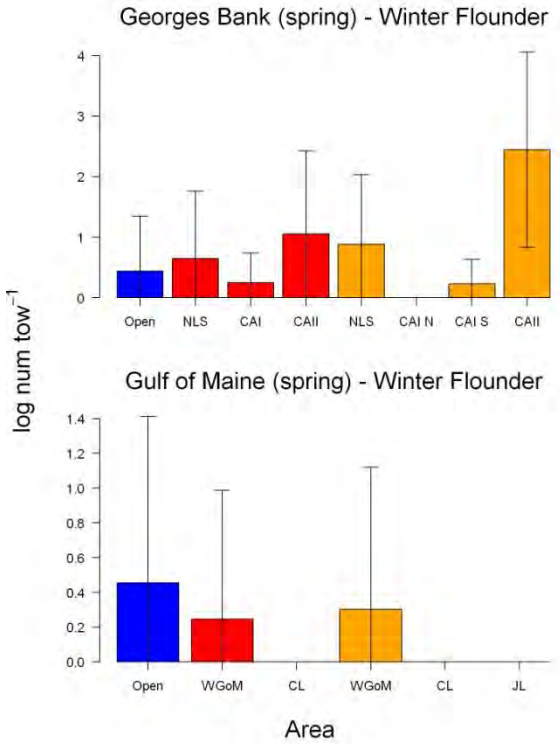
Mean Biomass CPUE Index 2005-2011



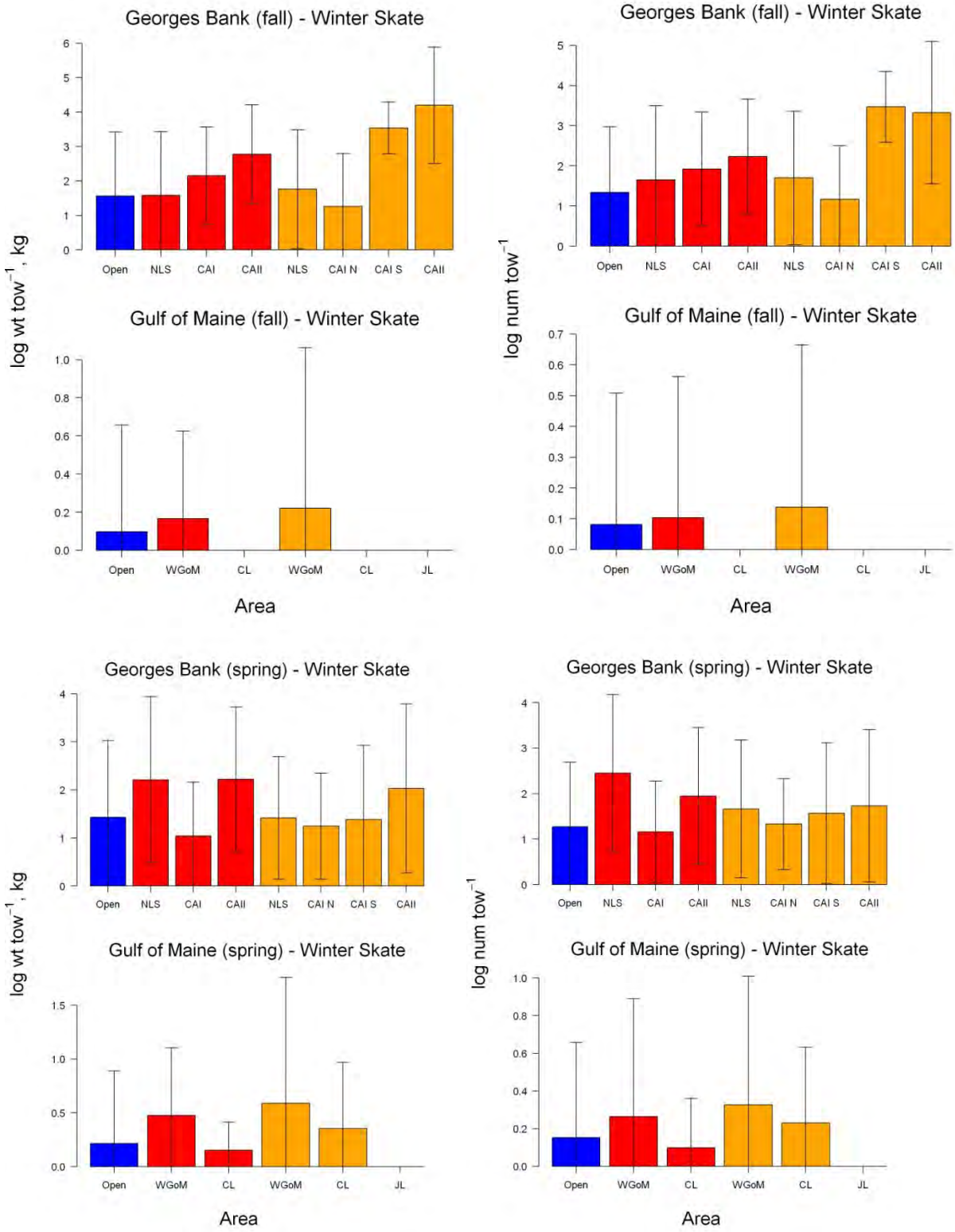


Mean Abundance CPUE Index 2005-2011





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



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

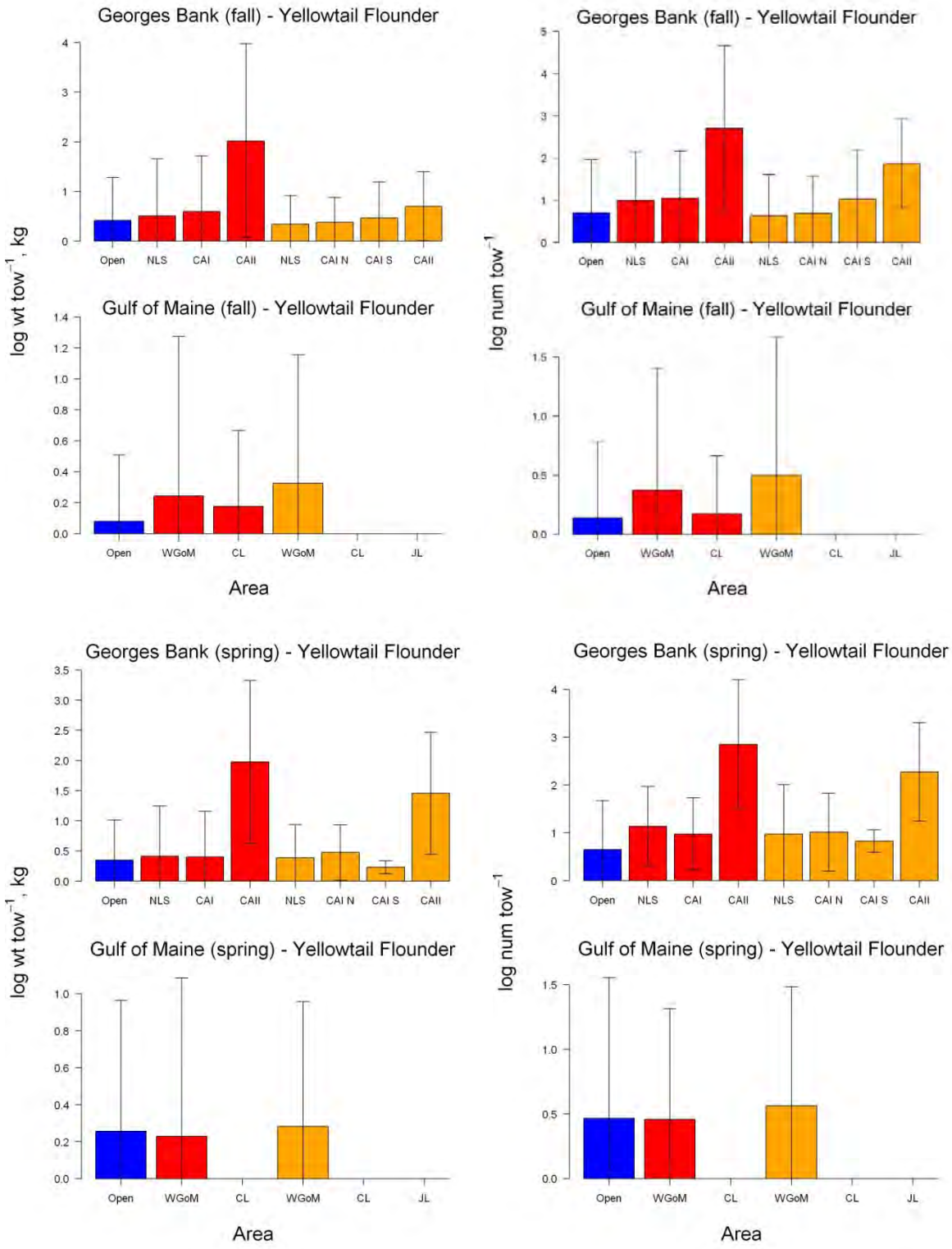


Table 6. Total abundance from NEFSC fall surveys 2005-2011

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 7. 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 8. 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 9. 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

4.1.3 Summary of Fishing Performace 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.

4.1.3.1 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 54. 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 55. 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 56. 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 54. Observed hauls by trawl type.

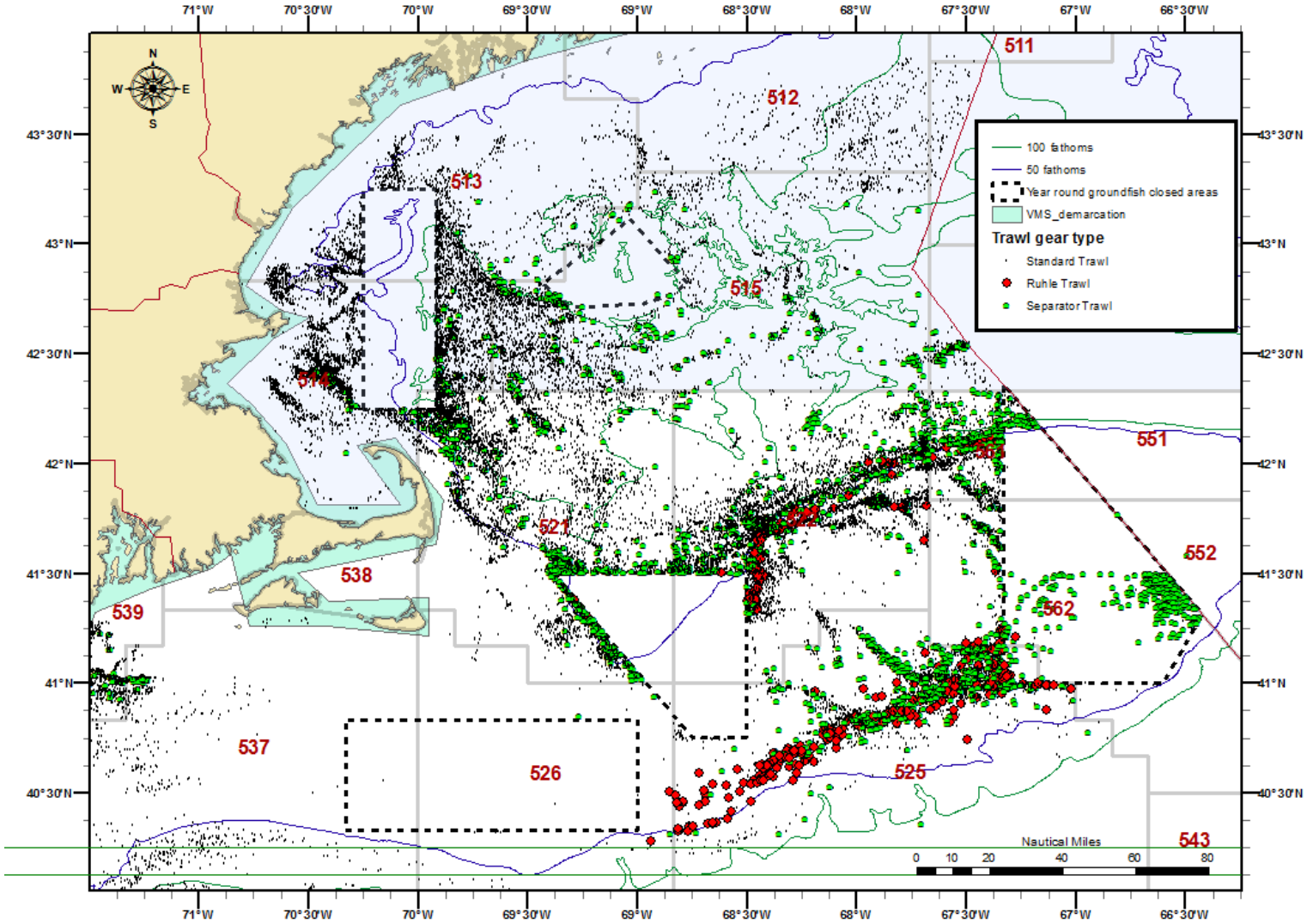


Figure 55. Observed hauls by target species using a standard trawl

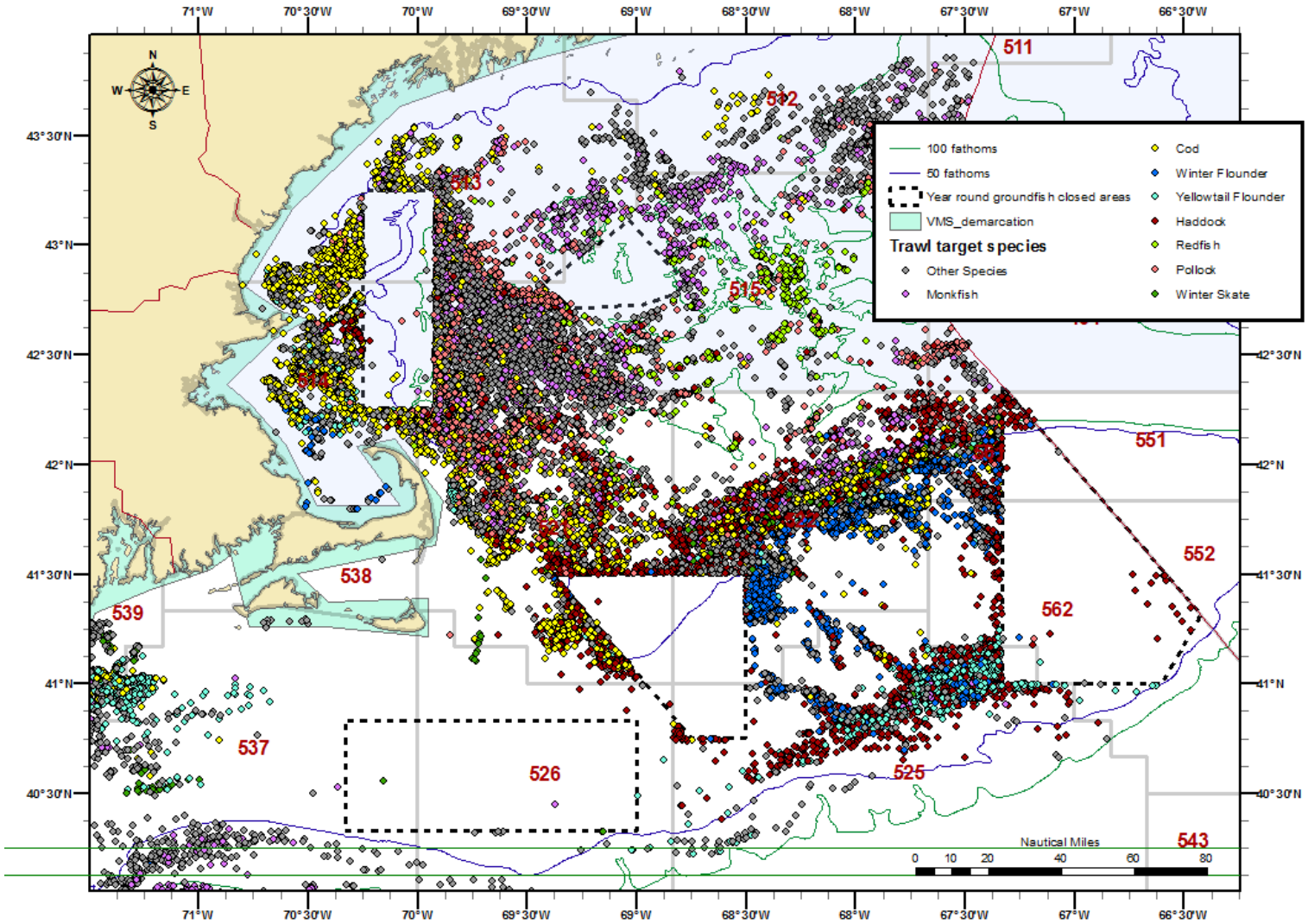
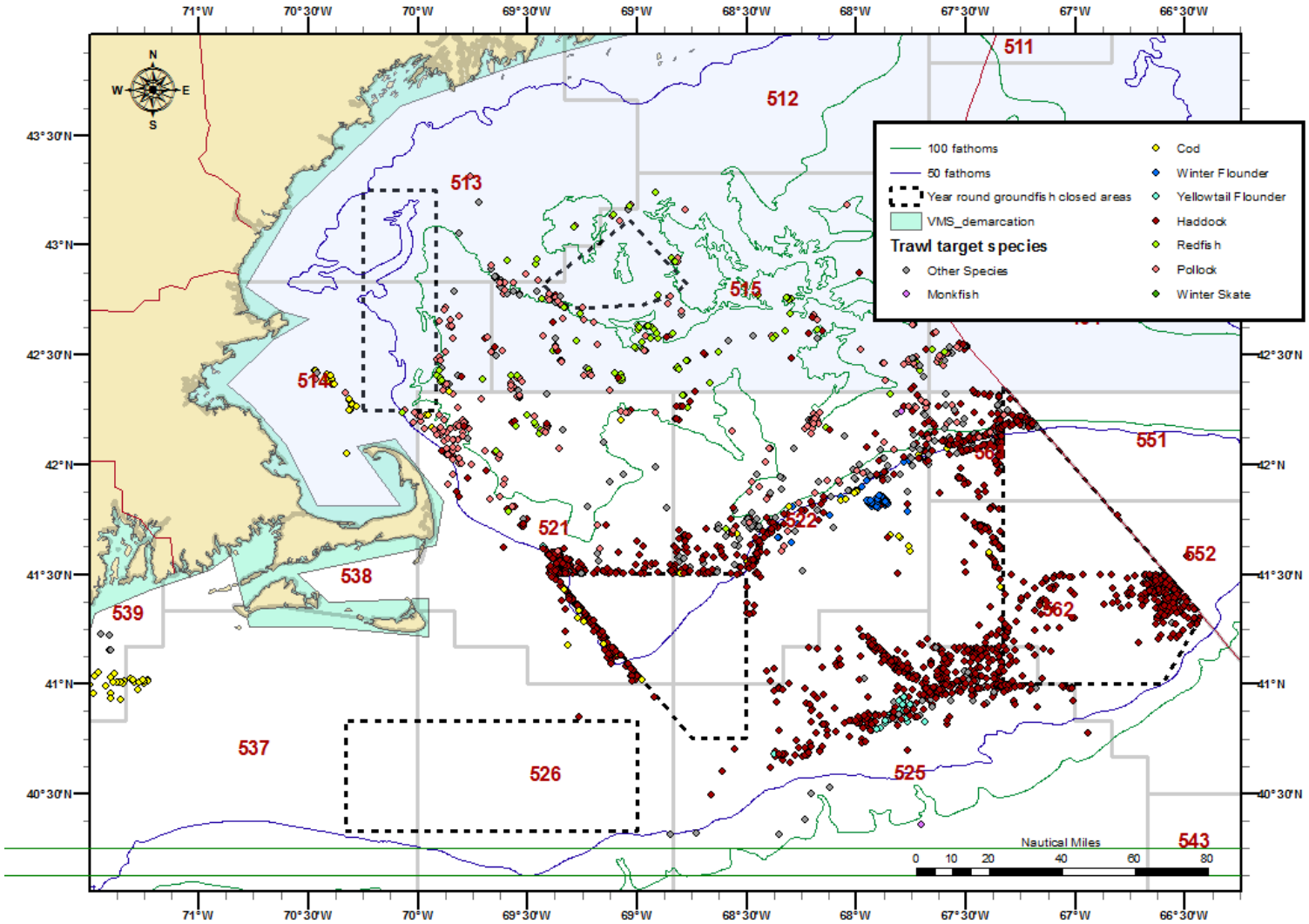


Figure 56. Observed hauls by target species using a separator trawl



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 .

4.1.3.2 **Table 10** 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 57**. The observed catch of each species is represented as a percentage within the total observed catch of all species for each year in

.

The purpose of **Table 10** and **Table 11** 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 10** 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 10** 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 11** 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 11**, 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.

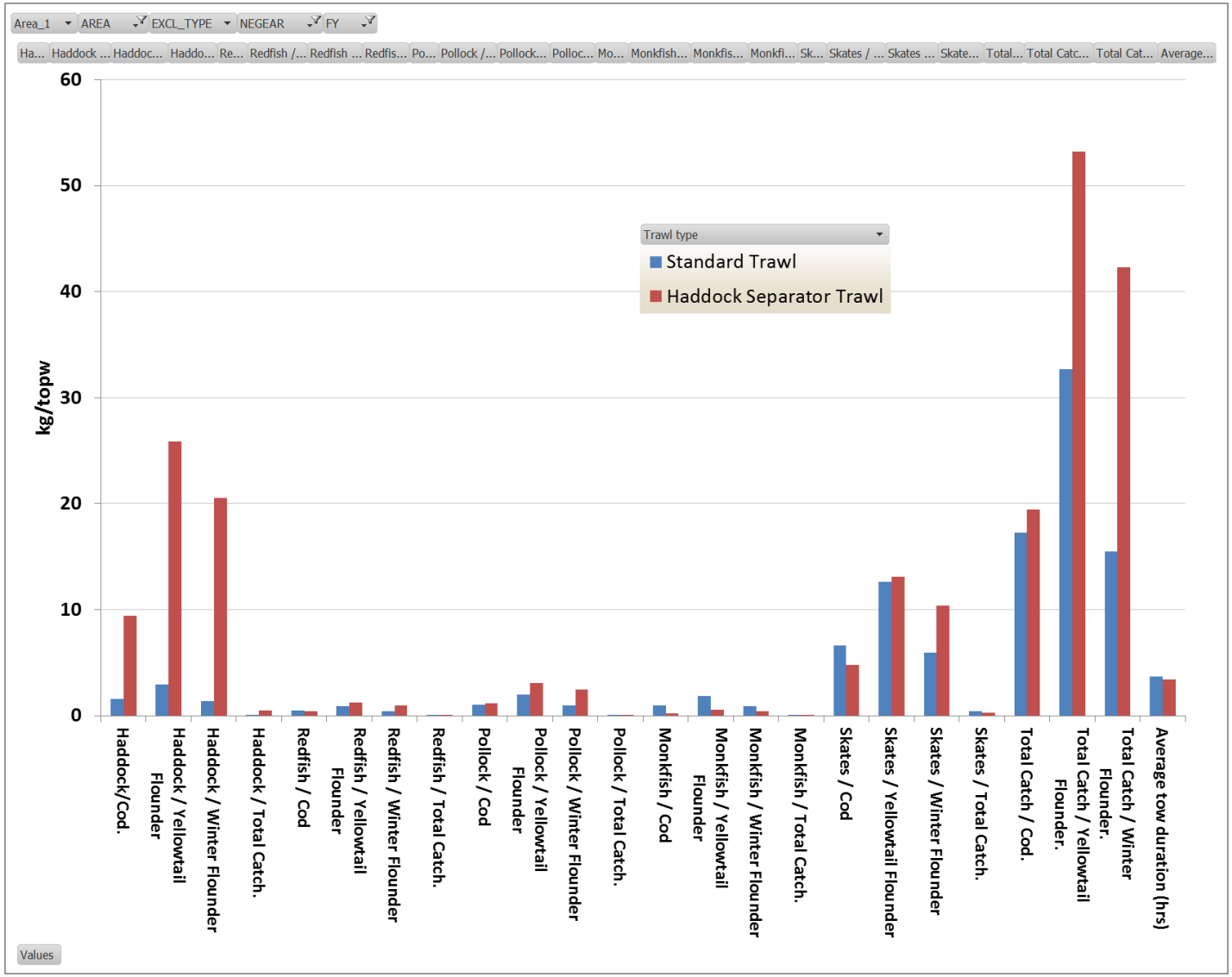
Table 10. Catch ratios for vessels using a standard or haddock separator trawl on Georges Bank.

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



The average catch per tow of each species specifically within Statistical Areas 525 and 562 are shown in Table 12. Statistical areas 525 and 562 were chosen to provide a comparison of hauls inside and outside Closed Area II. Those areas were also specifically chosen to represent hauls around the southern portion of Closed Area II due to those areas' ability to provide comparable data inside and outside Closed Area II. The evaluated period in Table 12 was reduced to 2010-2012 in order to focus on the most recent data available. The side-by-side comparison of catch per tow by trawl type allows for a simple comparison of trawl effectiveness. The amounts do not vary greatly for most species, though the largest differences occur for haddock and skates. As expected, the haddock separator trawl consistently reports higher haddock catch totals than the standard trawl, with the largest differences occurring in 2010 both inside and outside Closed Area II. The standard trawl reports higher catch amounts of skates each year, both inside and outside Closed Area II. The total catch/tow is consistently higher with the standard trawl than the separator trawl, with the largest difference between the two occurring inside Closed Area II in 2012. This occurs despite the very low number of standard trawl hauls occurring inside Closed Area II compared to haddock separator hauls. The haul durations do not vary greatly between trawl types, though minor shifts do occur. An example of this is the fact that on average, separator trawl hauls were longer in 2010 and standard trawl hauls were longer in 2011.

The comparison of separator trawl catch per tow inside and outside the closed area is shown inTable 13. The numerator is the catch per tow of that particular species inside Closed Area II and the denominator is the catch per tow of that particular species outside Closed Area II. To clarify, the cod/tow ratio of 0.35 indicates that there are 0.35 lbs. of cod caught per tow inside Closed Area II for every one lb. of cod caught per tow outside Closed Area II. This allows for an easy way to compare catch per tow inside and outside the closed area. The separator trawl ratios for inside/outside result in some interesting observations. The haddock/tow and monkfish/tow ratios decrease from 2010 to 2011. The change from 1.04 in 2010 to 0.81 in 2011 could indicate that now a greater amount of haddock and monkfish are caught per tow outside the closed area than inside. Not every species underwent this same change, as the greater catch per tow of skates shifted to inside the closed area in 2011. The cod/tow, winter flounder/tow and redfish/tow ratios do not fluctuate as much, showing a greater amount of cod being caught per tow outside the closed area in both years.

The comparison of separator trawl catch per tow and standard trawl catch per tow is shown inTable 14. These ratios were made using the observed tows that occurred outside Closed Area II. The separator trawl catch per tow is the numerator and the standard trawl catch per tow is the denominator. The listed cod/tow ratio of 1.99 indicates that there are 1.99 lbs. of cod caught per tow using the separator trawl for every one lb. of cod caught per tow using the standard trawl. This allows for a simple comparison of trawl performance outside the closed area. The ratios indicate some notable changes between 2010 and 2011, the most obvious of which being the great increase in cod per tow for the separator trawl in 2011. This increase shows the superior effectiveness of the separator trawl in catching cod outside Closed Area II in 2011. The other ratios remain relatively stable with the only exception being a shift toward equal performances between gear types for pollock/tow in 2011. The ratios of total catch/tow between gear types indicate a higher catch per tow for the standard trawl.

Table 12. Average catch per tow inside and outside Closed Area II

Fishing Year	2010		2011		2012		Overall Average/Grand Total
	Standard Trawl	Haddock Separator Trawl	Standard Trawl	Haddock Separator Trawl	Standard Trawl	Haddock Separator Trawl	
Inside Closed Area II							
Cod/tow	5	19	70	8	14	4	14
Haddock/tow	324	1,581	501	855	286	299	1,193
Yellowtail flounder/tow	245	56	18	38	13	8	49
Winter Flounder/tow	16	33	33	12	107	24	24
Redfish/tow	0	0	34	0	0	0	0
Monkfish/tow	12	7	30	2	27	3	5
Pollock/tow	0	1	15	1	3	0	1
Skates/tow	2,207	829	721	323	1,035	91	616
Total Catch/tow	3,148	2,599	1,675	1,304	2,000	490	1,984
Total Discards/tow	2,684	884	618	380	1,446	121	680
Total Observed Tows.	5	161	4	137	3	7	317
Average Haul Duration	3.10	3.66	4.13	3.62	4.93	2.79	3.63
Standard Dev. of Haul Duration	1.31	1.24	1.24	0.79	1.10	1.24	1.08
Outside Closed Area II							
Cod/tow	27	54	3	80	3		22
Haddock/tow	156	1,523	109	1,051	286		457
Yellowtail flounder/tow	221	48	367	65	341		255
Winter Flounder/tow	235	38	158	42	97		143
Redfish/tow	0	0	0	0	0		0
Monkfish/tow	33	5	79	3	17		49
Pollock/tow	0	1	0	0	0		0
Skates/tow	1,424	862	1,644	312	2,807		1,403
Total Catch/tow	3,141	2,642	3,098	1,688	5,797		3,015
Total Discards/tow	1,946	939	1,911	447	3,926		1,701
Total Observed Tows.	416	392	966	86	46		1906
Average Haul Duration	2.89	3.36	2.95	2.90	2.86		3.01
Standard Dev. of Haul Duration	1.01	0.97	0.80	0.98	0.93		0.91

Table 13. Ratios of observed separator trawl catch per tow inside and outside of Closed Area II

Separator Trawl catch per tow	2010	2011
Inside Closed Area / Outside Closed Area		
Cod/tow	0.35	0.09
Haddock/tow	1.04	0.81
Yellowtail flounder/tow	1.16	0.58
Winter Flounder/tow	0.87	0.28
Redfish/tow	0.05	0.31
Monkfish/tow	1.47	0.73
Pollock/tow	1.43	9.78
Skates/tow	0.96	1.03
Total Catch/tow	0.98	0.77
Total Discards/tow	0.94	0.85
Total Observed Tows.	0.41	1.59
Average Haul Duration	1.09	1.25
Standard Dev. of Haul Duration	1.28	0.80

Table 14. Ratios of trawl catch per tow outside Closed Area II

Separator Trawl catch per tow / Standard Trawl catch per tow	2010	2011
Outside Closed Area II		
Cod/tow	1.99	25.23
Haddock/tow	9.79	9.62
Yellowtail flounder/tow	0.22	0.18
Winter Flounder/tow	0.16	0.27
Redfish/tow	1.95	1.31
Monkfish/tow	0.15	0.04
Pollock/tow	7.19	1.06
Skates/tow	0.61	0.19
Total Catch/tow	0.84	0.54
Total Discards/tow	0.48	0.23
Total Observed Tows.	0.94	0.09
Average Haul Duration	1.16	0.98
Standard Dev. of Haul Duration	0.96	1.22

4.1.3.3 Gillnet and Hook gear performance

The catch ratios for vessels using gillnets on Georges Bank are displayed in and Table 15. A ratio over 1.00 indicates a greater catch of the species in the numerator than in the denominator. For example, the skates / spiny dogfish ratio of 3.49 in Georges Bank indicates that there were 3.49 lbs. of skates caught for every 1 lb. of spiny dogfish. Skates are the only listed species in that were caught more than cod, while haddock, redfish, monkfish and pollock all reported a lower catch than cod. The skates/species ratios are the highest ratios in the table aside from the total catch/species ratios, indicating that skates made up a large amount of the total catch. The very low haddock/species ratios and redfish/species ratios indicate that haddock and redfish were caught much less often than cod and spiny dogfish. The species/cod ratios remain consistently over or under 1.00 for most species in the table except for pollock and monkfish. There was a higher observed catch of pollock than cod in 2011 and a relatively equal catch of the two in 2005, 2009 and 2010. There was a trend of higher monkfish catch than cod from 2004-2007 until the relative catch of monkfish dropped significantly in later years. Skates and spiny dogfish made up the majority of the observed total catch over the evaluated time period in Table 16. This could indicate that vessels using gillnets on Georges Bank will continue to target skates and spiny dogfish in the future.

Table 15. Catch ratios for vessels using gillnets on Georges Bank.

Fishing Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	Overall Average
Gillnet										
Haddock/Cod.	0.11	0.04	0.03	0.02	0.02	0.06	0.14	0.03	0.08	0.07
Haddock/Spiny Dogfish.	0.04	0.02	0.01	0.01	0.01	0.03	0.05	0.01	0.01	0.02
Haddock / Total Catch.	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Redfish / Cod	0.01	0.09	0.00	0.36	0.16	0.03	0.02	0.08	0.03	0.07
Redfish/Spiny Dogfish	0.00	0.04	0.00	0.14	0.06	0.01	0.01	0.02	0.00	0.02
Redfish / Total Catch.	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Pollock / Cod	0.39	0.97	0.37	0.57	0.87	1.02	0.99	1.35	0.68	0.89
Pollock/Spiny Dogfish	0.16	0.43	0.10	0.22	0.32	0.44	0.32	0.26	0.07	0.24
Pollock / Total Catch.	0.03	0.07	0.02	0.02	0.05	0.12	0.05	0.05	0.02	0.04
Monkfish / Cod	1.96	1.99	1.09	1.52	0.34	0.21	0.64	0.66	0.52	0.96
Monkfish/Spiny Dogfish	0.82	0.88	0.30	0.60	0.12	0.09	0.21	0.13	0.06	0.26
Monkfish / Total Catch.	0.13	0.14	0.07	0.05	0.02	0.02	0.03	0.02	0.02	0.05
Skates / Cod	8.20	7.30	9.31	22.76	12.78	2.63	14.57	17.90	18.21	13.16
Skates/Spiny Dogfish	3.43	3.25	2.56	8.92	4.70	1.13	4.76	3.41	1.95	3.49
Skates / Total Catch.	0.55	0.51	0.58	0.76	0.70	0.32	0.69	0.66	0.59	0.63
Total Catch / Cod.	15.02	14.39	16.04	29.88	18.29	8.35	21.15	27.25	30.75	20.78
Total Catch/Spiny Dogfish	6.28	6.40	4.41	11.71	6.73	3.60	6.91	5.20	3.29	5.51

Table 16. Observed % of each species in total catch using gillnets on Georges Bank

Fishing Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average %
Gillnet										
% of Cod in Total Catch.	6.7%	7.0%	6.2%	3.3%	5.5%	12.0%	4.7%	3.7%	3.3%	4.8%
% of Haddock in Total Catch.	0.7%	0.2%	0.2%	0.1%	0.1%	0.7%	0.7%	0.1%	0.3%	0.4%
% of Monkfish in Total Catch.	13.0%	13.8%	6.8%	5.1%	1.8%	2.5%	3.0%	2.4%	1.7%	4.6%
% of Pollock in Total Catch.	2.6%	6.7%	2.3%	1.9%	4.7%	12.2%	4.7%	4.9%	2.2%	4.3%
% of Redfish in Total Catch.	0.1%	0.6%	0.0%	1.2%	0.9%	0.4%	0.1%	0.3%	0.1%	0.3%
% of Skates in Total Catch.	54.6%	50.8%	58.0%	76.2%	69.9%	31.5%	68.9%	65.7%	59.2%	63.4%
% of Winter Flounder in Total Catch	0.6%	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
% of Yellowtail Flounder in Total Catch	0.4%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%
% of Spiny Dogfish in Total Catch.	15.9%	15.6%	22.7%	8.5%	14.9%	27.8%	14.5%	19.2%	30.4%	18.1%

The catch ratios for vessels using hook gears on Georges Bank are displayed in and Table 17. A ratio over 1.00 indicates a greater catch of the species in the numerator than in the denominator. For example, the haddock / cod ratio of 7.28 in Georges Bank indicates that there were 7.28 lbs. of haddock caught for every 1 lb. of cod. The observed catch of each species is represented as a percentage within the total observed catch of all species for each year in Table 18.

The catch ratios for vessels using hook gears on Georges Bank are displayed in Table 17. All of the species/cod and species/spiny dogfish ratios in Table 17 are under 1.00 except for haddock. There was a consistently higher catch of haddock each year than cod or spiny dogfish, except for 2011-2012. Haddock made up the majority of the observed total catch over the evaluated time period in Table 18. The very low percentages of every other species indicate that vessels using hook gears will likely primarily focus on haddock and spiny dogfish on Georges Bank in the future.

Table 17. Ratios of observed catch for vessels using hook gears on Georges Bank

Fishing Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	Overall Average
Hook and Line										
Haddock/Cod.	18.72	9.91	7.35	13.96	7.52	3.67	3.90	0.82	0.23	7.28
Haddock/Spiny Dogfish	2.24	7.28	0.77	1.40	6.18	1.80	1.12	0.17	0.00	1.54
Haddock / Total Catch.	0.64	0.71	0.39	0.53	0.69	0.47	0.37	0.11	0.00	0.50
Redfish / Cod	0.09	0.09	0.01	0.08	0.05	0.01	0.03	0.00	0.00	0.04
Redfish/Spiny Dogfish	0.01	0.06	0.00	0.01	0.04	0.00	0.01	0.00	0.00	0.01
Redfish / Total Catch.	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pollock / Cod	0.01	0.01	0.00	0.00	0.00	0.00	0.05	0.14	0.12	0.02
Pollock/Spiny Dogfish	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.01
Pollock / Total Catch.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Monkfish / Cod	0.08	0.04	0.04	0.03	0.00	0.00	0.01	0.00	0.00	0.02
Monkfish/Spiny Dogfish	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Monkfish / Total Catch.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skates / Cod	0.28	0.83	0.82	0.74	0.78	0.96	1.57	0.80	0.72	0.93
Skates/Spiny Dogfish	0.03	0.61	0.09	0.07	0.64	0.47	0.45	0.17	0.01	0.20
Skates / Total Catch.	0.01	0.06	0.04	0.03	0.07	0.12	0.15	0.10	0.01	0.06
Total Catch / Cod.	29.29	13.89	19.04	26.29	10.90	7.79	10.54	7.75	88.59	14.45
Total Catch/Spiny Dogfish	3.51	10.21	2.00	2.63	8.95	3.81	3.04	1.62	1.02	3.06

Table 18. Observed % of each species in total catch using hook gears on Georges Bank

Fishing Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average %
(blank)										
% of Cod in Total Catch.	3.4%	7.2%	5.3%	3.8%	9.2%	12.8%	9.5%	12.9%	1.1%	6.9%
% of Haddock in Total Catch.	63.9%	71.4%	38.6%	53.1%	69.1%	47.2%	37.0%	10.6%	0.3%	50.4%
% of Monkfish in Total Catch.	0.3%	0.3%	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
% of Pollock in Total Catch.	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.5%	1.8%	0.1%	0.2%
% of Redfish in Total Catch.	0.3%	0.6%	0.1%	0.3%	0.5%	0.1%	0.3%	0.0%	0.0%	0.3%
% of Skates in Total Catch.	1.0%	6.0%	4.3%	2.8%	7.2%	12.4%	14.8%	10.3%	0.8%	6.4%
% of Winter Flounder in Total Catch	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%
% of Yellowtail Flounder in Total Catch	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% of Spiny Dogfish in Total Catch.	28.5%	9.8%	49.9%	38.0%	11.2%	26.2%	32.9%	61.6%	97.6%	32.7%

4.2 PHYSICAL ENVIRONMENT

4.2.1 Eastern Georges Bank

Georges Bank is a shallow, elongate extension of the continental shelf that was formed during the last ice age. Glacial retreat during the late Pleistocene deposited the bottom sediments currently observed on the bank, and the sediments have been continuously reworked and redistributed by the action of rising sea level, and by tidal, storm and other currents. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor 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 the bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals, which are located west of the groundfish and habitat closed areas on the eastern portion of the bank. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/hr, and as high as 7 km/hr. In addition to their effects on the sediments, these strong, erosive currents also affect the character of the biological community.

The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of the bank. Currents in these areas are strongest where water depth is shallower than 50 m and flow to the south out of the Gulf of Maine on the western side of the channel and to the north on the eastern side. 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.

One of the four proposed exemption areas is located on the eastern portion of Georges Bank. The portion of Closed Area 2 (CA II) on eastern Georges Bank that would be opened is located north of 41°30´N latitude and south of the habitat closed area (Figure 58). The bank here is very steep along its northern edge, rising to depths of less than 30 meters (m) on the top of the bank before dropping off gradually into deeper water to the southeast. Depths in the proposed exemption area vary from 40-50 m to 80 m in the southeast corner. Eastern Georges Bank is composed of a series of parallel northwest-southeast trending sand waves with intervening troughs of coarser gravel (granule-pebble and cobble) substrate. Four dominant substrate types identified by Harris and Stokesbury (2010) are shown in Figure 59.[3] There are

[3] Other sediment type metrics that were assessed in this study were the largest type, the average of all types, and the variability in types. The dominant, or most frequently-occurring, type was defined as

also some areas dominated by boulders (diameter >10 inches). The shallowest portion of the bank is located west of CA II (Figure 58). Strong tidal currents constantly move the sand back and forth and the shallower portions of the bank are also periodically affected by wave action, particularly during winter storms. The coarser gravel substrate is much more stable. It also provides a more suitable substrate for attached epifaunal organisms (e.g., sponges, bryozoans). Using substrate data derived from systematic video camera surveys of the bank (e.g., dominant substrates,Figure 59) and model estimates of maximum tidal current velocities at the bottom (Chen et al. 2003, 2011, and Cowles et al. 2008), Harris and Stokesbury (2012) calculated spatially-explicit sediment stability indices for Georges Bank. Within the proposed exemption area, tidally-driven critical shear stress levels were inversely related to depth and matched or exceeded sediment critical levels wherever depth was <50 m. In shallow water, only sediments containing gravel remained stable. In the proposed exemption area, stable sediments (values <1, gravel areas in blue) are located in the northwest portion of the area; unstable sediments (values >1, sandy areas in red) are in deeper water to the southeast (Figure 60).

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the mode of the scores from four samples (video images) at a station, where scores were assigned to different sediment types according to their sizes (mud-silt = 1 to boulder = 5). In cases where sediment types were equally frequent (e.g., sand and granule-pebble in all four quadrats) the larger sediment type was considered "dominant."

Figure 58. Eastern Georges Bank bathymetry. Proposed exemption area in Closed Area 2 is located south of the habitat closed area (shaded) and north of 41° 30 minutes N latitude. Depths are in meters..

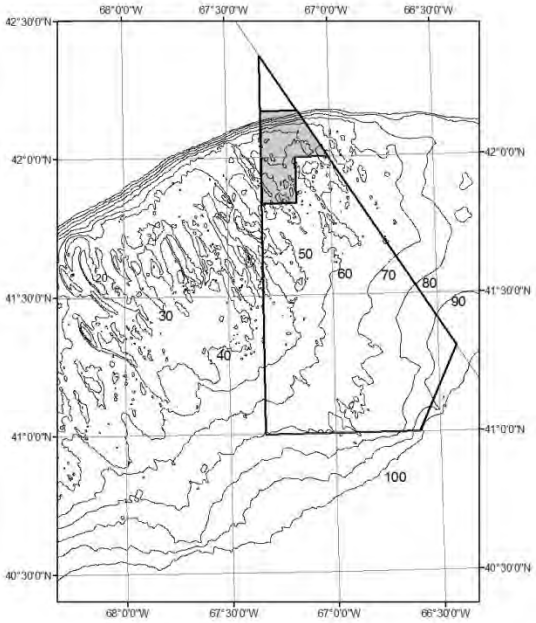


Figure 59. Dominant substrates on eastern Georges Bank. See text for details.

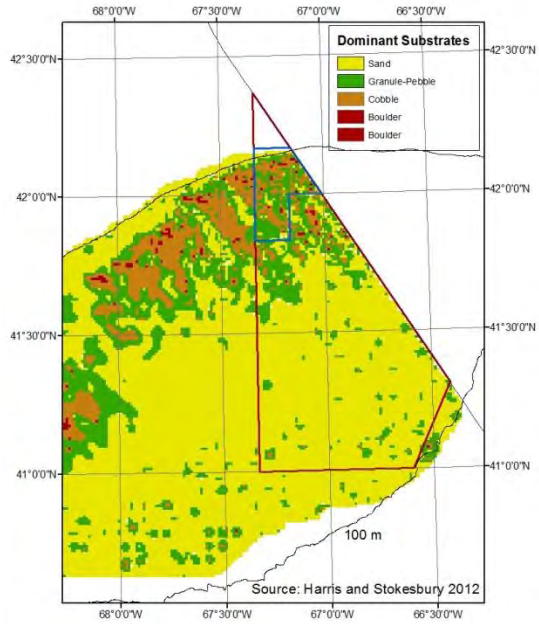


Figure 60. Sediment stability, eastern Georges Bank, with stable sediments in blue and mobile sediments in red. See text for details

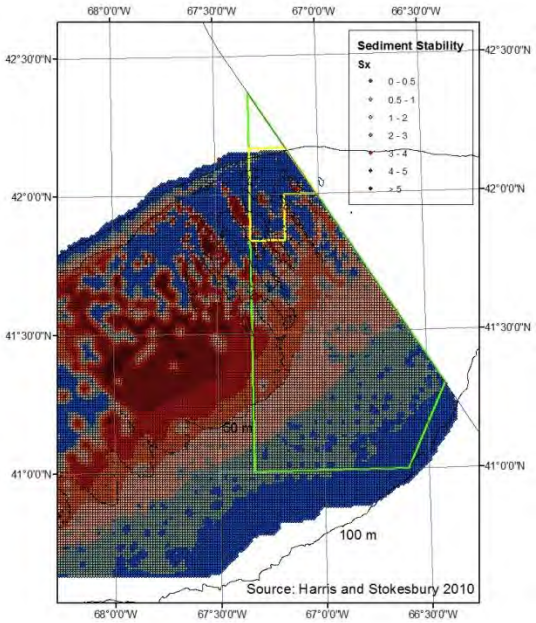
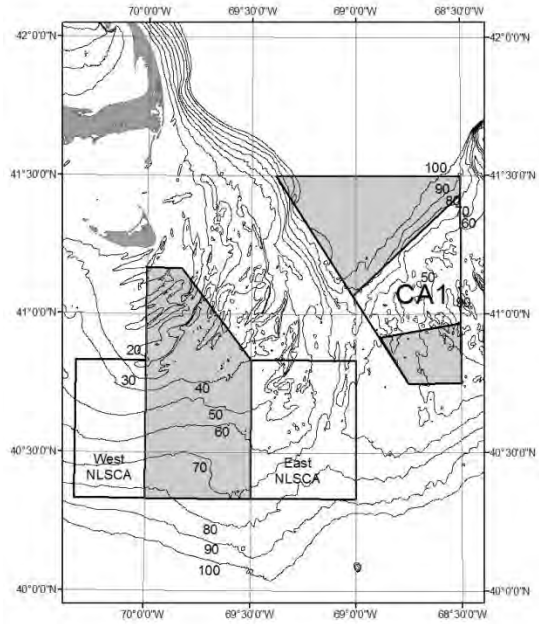


Figure 61. Bathymetry on western Georges Bank, Great South Channel, and Nantucket Shoals.



* Proposed exemption areas are un-shaded portions of the Nantucket Lightship Closed Area (NLCA) and Closed Area 1 (CA I). Depths are in meters

4.2.2 Closed Area 1 and Nantucket Lightship

The other proposed exemption areas are located in the middle of Closed Area 1 (CA I) and on the eastern and western sides of the Nantucket Lightship Closed Area (NLCA) (Figure 61). Most of the CA I exemption area is 50-70 m deep with dominant sand, granule-pebble, cobble, and boulder substrates (Figure 62). The bottom drops off into deeper water along the northern boundary of the area. Strong southward-flowing tidal and residual currents on the western side of this area have produced 5-15 m high sand waves that run east and west with steeper slopes on their southern sides (Richard Taylor, personal communication). Critical bottom shear stress values ranging from >2 to <0.5 indicate that the coarser sediments (blue in Figure 63) are not moved by tidal currents whereas the finer sediments (red in Figure Figure 63) are not stable. As is the case in CA II, this analysis does not account for bottom disturbance caused by wave action, which can be significant during storms.

The proposed eastern NLCA exemption area is located on Nantucket Shoals and extends into the Great South Channel (Figure 61). 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 boundaryFigure 62). 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 63).

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 breakFigure 61). 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 64).[4] 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 65). 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.

[4] 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 62. Dominant substrates on western Georges Bank, Great South Channel, and eastern NLCA. See text for details.

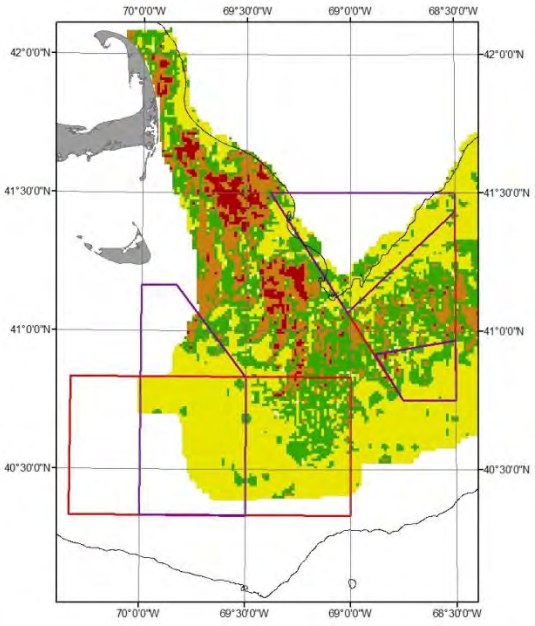
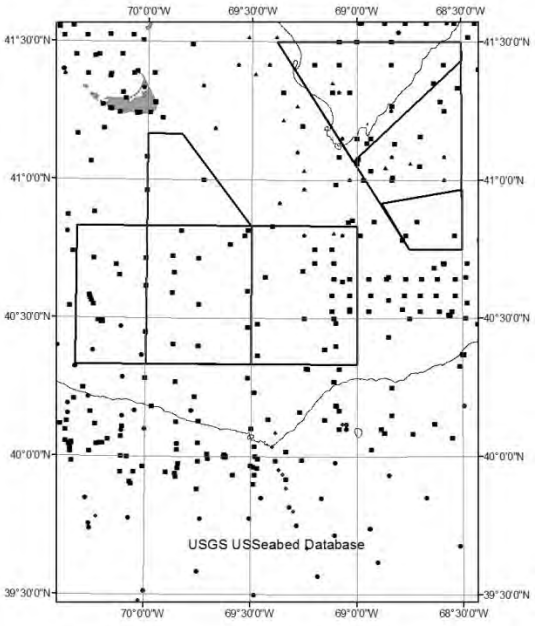


Figure 63. Sediment types in and around proposed exemption areas in CA I and the NLCA.



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

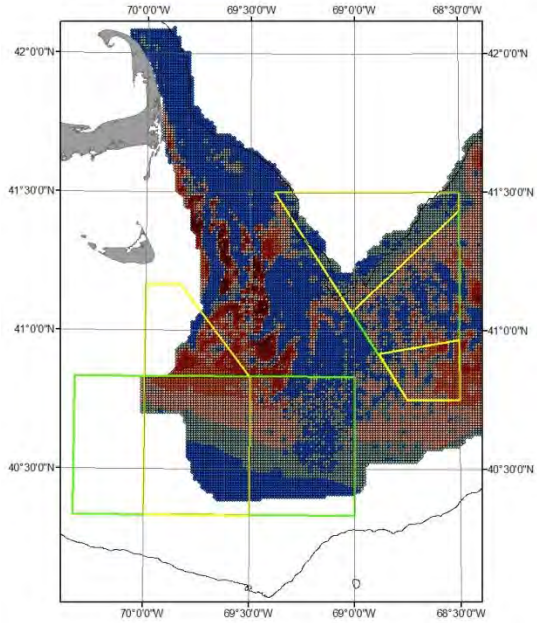
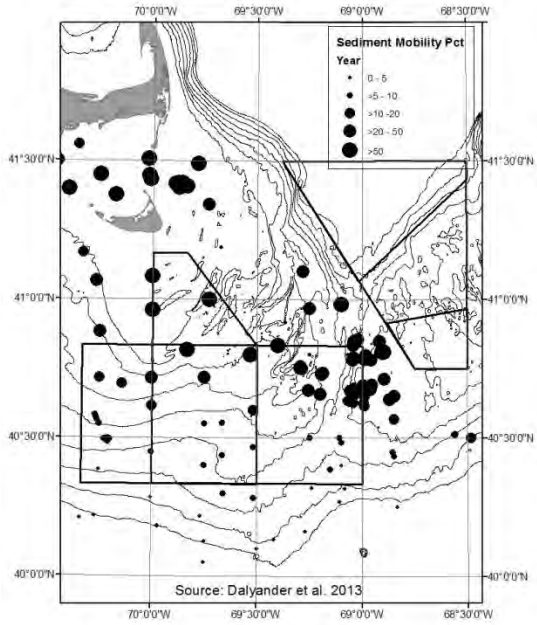


Figure 65. Sediment mobility in and around proposed exemption areas in the NLCA expressed as the percentage of time critical shear stress is exceeded annually. See text for details.



4.2.3 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 distribution and abundance of fishery resources. Depth, temperature, substrate, circulation, salinity, light, dissolved oxygen, and nutrient supply are important parameters of a given habitat. These parameters determine what types and numbers of organisms the habitat supports. Table 19 summarizes the geographic range, depth range, and sediment associations for the benthic life stages of each federally-managed species in the Northeast region that could potentially be affected by this action

4.2.4 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 the fifteen species that are managed under the Northeast Multispecies FMP as well as Atlantic sea scallops, monkfish, five species of skates in the northeast skate complex, Atlantic herring, summer flounder, scup, black sea bass, longfin fin squid, Atlantic surfclams and ocean quahogs. EFH for the species managed under these FMPs includes a wide variety of benthic habitat types in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem (see Table 19). Section 6.1.7.2 of the FW 48 EA describes the habitats utilized by managed species that are found in the exemption areas. Full descriptions and maps of EFH for each species and life stage are available on the NMFS Northeast Region website at http://www.nero.noaa.gov/hcd/index2a.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.

4.2.5 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 2013 operations. Section 4.2.4.1 of the FY 2013 Sector Operations and Contracts EA discusses the characteristics of each of the gear types. The typical impacts to the physical habitat associated with each of these gear types is discussed below.

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

The Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (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).

Table 19. EFH descriptions for all benthic life stages of federally-managed species in the U.S. Northeast Shelf Ecosystem that could potentially be affected by this action.*

Species	Life Stage	Offshore Geographic Area of EFH	Depth (meters)	Bottom Types
American plaice	juvenile	GOM	45 - 150	Fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOM	45 - 175	Fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off southern New England	25 - 75	Cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off southern New England	10 - 150	Rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOM and GB	20 - 60	Sand, gravel, or clay
Atlantic halibut	adult	GOM and GB	100 - 700	Sand, gravel, or clay
Atlantic herring	eggs	GOM and GB	20 – 80	Attached to gravel, sand, cobble or shell fragments, also on macrophytes
Atlantic sea scallop	juvenile	GOM, GB, southern New England and middle Atlantic south to Virginia-North Carolina border	18 - 110	Cobble, shells, and silt
Atlantic sea scallop	adult	GOM, GB, southern New Englandand middle Atlantic south to Virginia-North Carolina border	18 - 110	Cobble, shells, coarse/gravelly sand, and sand
Atlantic wolffish	eggs	GOM south to Cape Cod and on GB	40- 240	Eggs deposited in rocky substrates
Atlantic wolffish	juvenile	Continental shelf and slope within the GOM south to Cape Cod and on GB	40 - 240	Substrate preferences range from large stones and rocks to softer substrates
Atlantic wolffish	adult	Continental shelf and slope within the GOM south to Cape Cod and on GB	40 - 240	Substrate preferences range from large stones and rocks to softer substrates
Haddock	juvenile	GB, GOM, middle Atlantic south to Delaware Bay	35 - 100	Pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOM	40 - 150	Broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Monkfish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern New England, all areas of GOM	25 - 200	Sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Monkfish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern New England, outer perimeter of GB, all areas of GOM	25 - 200	Sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	eggs	GOM, GB, southern NE, and middle Atlantic south to Delaware Bay	<50	Generally in hard bottom sheltered nests, holes, or crevices
Ocean pout	juvenile	GOM, GB, southern NE, middle Atlantic south to Delaware Bay	< 50	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOM, GB, southern New England, middle Atlantic south to Delaware Bay	< 80	Bottom habitats, often smooth bottom near rocks or algae

Pollock	juvenile	GOM and GB	0 – 250	Aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOM, GB, southern New England, and middle Atlantic south to New Jersey	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras	< 100	Shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off southern New England, and middle Atlantic south to Cape Hatteras	10 - 130	Bottom habitats in depressions with a substrate of sand and mud
Redfish	juvenile	GOM, southern edge of GB	25 - 400	Silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50 - 350	Silt, mud, or hard bottom
White hake	juvenile	GOM, southern edge of GB, southern New England to middle Atlantic	5 - 225	Seagrass beds or a substrate of mud or fine-grained sand
White hake	adult	GOM, southern edge of GB, southern New England to middle Atlantic	5 - 325	Mud or fine grained sand
Silver hake	juvenile	GOM, GB, continental shelf off southern New England, middle Atlantic south to Cape Hatteras	20 – 270	All substrate types
Silver hake	adult	GOM, GB, continental shelf off southern New England, middle Atlantic south to Cape Hatteras	30 – 325	All substrate types
Windowpane flounder	juvenile	GOM, GB, southern New England, middle Atlantic south to Cape Hatteras	1 - 100	Mud or fine grained sand
Windowpane flounder	adult	GOM, GB, southern New England, middle Atlantic south to Virginia - NC border	1 - 75	Mud or fine grained sand
Winter flounder	eggs	GB, inshore areas of GOM, southern New England, and middle Atlantic south to Delaware Bay	<5	Sand, muddy sand, mud, and gravel
Winter flounder	juvenile	GB, inshore areas of GOM, southern New England, middle Atlantic south to Delaware Bay	0.1 – 10 (1 - 50, age 1+)	Mud or fine grained sand
Winter flounder	adult	GB, inshore areas of GOM, southern New England, middle Atlantic south to Delaware Bay	1 - 100	Bottom habitats including estuaries with substrates of mud, sand, grave
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500	Fine grained substrate
Witch flounder	adult	GOM, outer continental shelf from GB south to Chesapeake Bay	25 - 300	Fine grained substrate
Yellowtail flounder	juvenile	GB, GOM, southern New England, continental shelf south to Delaware Bay	20 - 50	Sand or sand and mud
Yellowtail flounder	adult	GB, GOM, southern New England, continental shelf south to Delaware Bay	20 - 50	Sand or sand and mud
Black sea bass	juvenile	Demersal waters over continental shelf from GOM to Cape Hatteras	1 - 38	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches

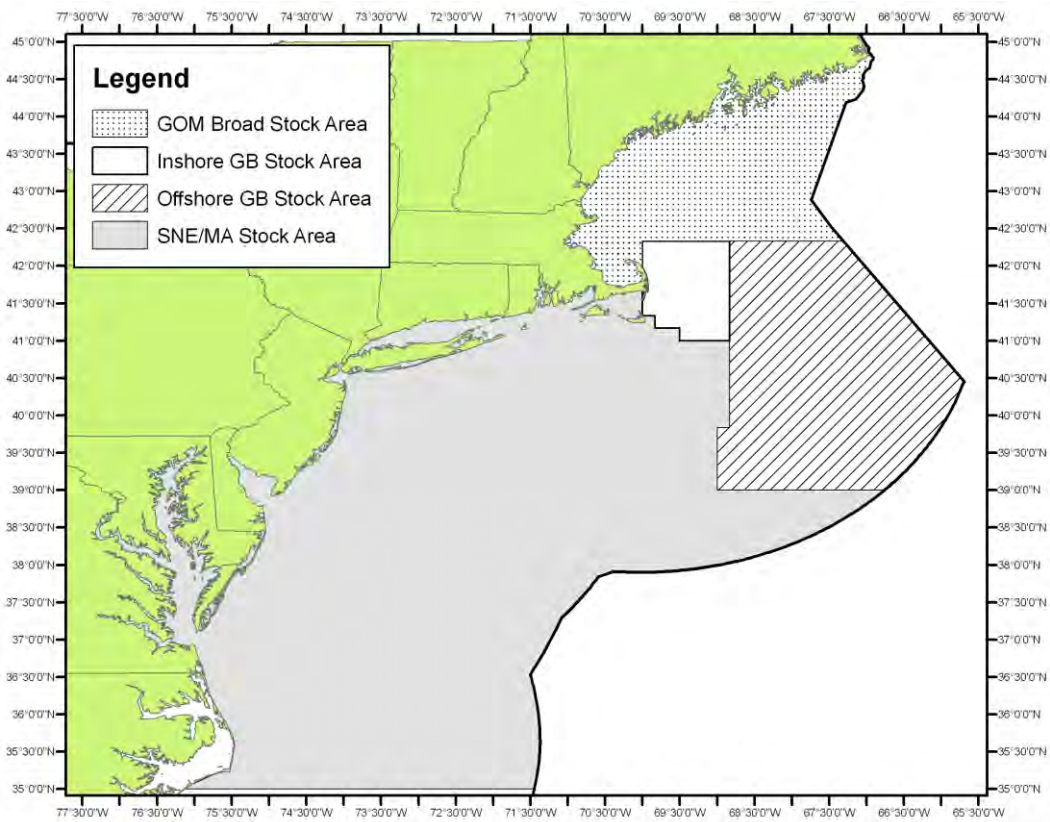
Black sea bass	adult	Demersal waters over continental shelf from GOM to Cape Hatteras, NC	20 - 50	Structured habitats (natural and manmade), sand and shell substrates preferred
Ocean quahog	juvenile	Eastern edge of GB and GOM throughout the Atlantic EEZ	8 - 245	Throughout substrate to a depth of 3 ft
Ocean quahog	adult	Eastern edge of GB and GOM throughout the Atlantic EEZ	8 - 245	Throughout substrate to a depth of 3 ft
Atlantic surfclam	juvenile	Eastern edge of GB and the GOM throughout Atlantic EEZ	0 - 60	Throughout substrate to a depth of 3 ft
Atlantic surfclam	adult	Eastern edge of GB and the GOM throughout Atlantic EEZ	0 - 60	Throughout substrate to a depth of 3 ft
Scup	juvenile	Continental shelf from GOM to Cape Hatteras, NC	From coast to limit of EEZ	On various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOM to Cape Hatteras, NC	From coast to limit of EEZ	Various substrate types
Summer flounder	juvenile	Over continental shelf from GOM to Cape Hatteras, NC; south of Cape Hatteras to Florida.	Shallow coastal and estuarine waters to 150	On muddy substrate but prefer mostly sand
Summer flounder	adult	Over continental shelf from GOM to Cape Hatteras, NC; south of Cape Hatteras to Florida	Shallow coastal and estuarine waters to 150	Demersal waters and estuaries
Longfin squid	eggs	GB, southern New England, and middle Atlantic to mouth of Chesapeake Bay	<50	Egg masses attached to rocks, boulders and vegetation on sand or mud bottom
Barndoor skate	juvenile	Eastern GOM, GB, Southern New England, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150	Mud, gravel, and sand
Barndoor skate	adult	Eastern GOM, GB, Southern New England, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150	Mud, gravel, and sand
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC	0 - 137, mostly 73 - 91	Sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC	0 - 137, mostly 73 - 91	Sandy or gravelly substrate or mud
Smooth skate	juvenile	Offshore banks of GOM	31 – 874, mostly 110 - 457	Soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOM	31 – 874, mostly 110 - 457	Soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile	GOM and GB	18 - 2000, mostly 111 - 366	Sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOM and GB	18 - 2000, mostly 111 - 366	Sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern New England shelf through Mid-Atlantic Bight to North Carolina	0 - 371, mostly < 111	Sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern New England shelf through Mid-Atlantic Bight to North Carolina	0 - 371, mostly < 111	Sand and gravel or mud

* Inshore estuaries identified as EFH have been removed from the geographic area descriptions.

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 66 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/ (NEFSC 2010).

Figure 66. Broad stock areas as defined in Amendment 16



4.3.1 Species and Stock Status Descriptions

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

> 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)

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 no allocate these species. They and are managed under their own FMPs.

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

4.3.2 Stock Status Trends

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

Table 20. Status of the Northeast Groundfish Stocks for fishing year 2013

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

Notes:

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

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

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

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

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

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

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

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

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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

4.4 NON-ALLOCATED TARGET SPECIES AND BYCATCH

Non-allocated target species are species which sector vessels are not assigned an ACE but can target and land. Bycatch refers to fish which are harvested in a fishery, but are discarded and not sold or kept for personal use. Non-allocated target species and bycatch may include a broad range of species. For purposes of this assessment the non-allocated target species and bycatch most likely to be affected by the sector operations plans include spiny dogfish, skates, and monkfish. This approach follows the convention established in Amendment 16. Spiny dogfish, skates, and monkfish were the top three non-groundfish species landed by multispecies vessels in FY 2006 and FY 2007 under the Category B (regular) DAS program (Amendment 16, Table 87).

American lobster is also included as a non-target bycatch species because many sector vessels also fish in the lobster fishery and this action proposes changes to American lobster regulations. 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 Stock Status of Non-Allocated Target Species

Section 4.4 of the FY 2013 Sector Operations and Contracts EA fully describes the life history and stock status of these non-allocated target species. The stock status of these species is summarized below.

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.

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*). Based on NEFSC bottom trawl survey data through autumn 2011/spring 2012 one skate species was overfished (thorny) and overfishing was not occurring in any of the seven skate species.

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.

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).

4.5 PROTECTED RESOURCES AFFECTED ENVIRONMENT

Both Framework 48 and the Environmental Assessment for the FY 2013 Sector Operations Plans and Contracts include a comprehensive explanation and analyses of protected resources including Altantic sturgeon, marine mammals such as harbor porpoise and North Atlantic right whales, and sea turtles. The information below is a brief summary of some of that information as well as a few additional analyses that are more applicable to the year-round closed areas discussed in this action. For additional information, refer to Framework 48 and the EA for FY 2013 Sector Operations Plans and Contracts.

4.5.1 Species Present in the Area

Table 21 lists the species, protected either by the ESA, the MMPA, or both, that may be found in the environment utilized sectors. Table 21 also includes three candidate fish species, as identified under the ESA.

Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA. Candidate species also include those species for which NMFS has initiated an ESA status review through an announcement in the *Federal Register*.

Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. NMFS has initiated review of recent stock assessments, bycatch information, and other information for these candidate and proposed species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information reviews. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10).

Table 21. Species Protected Under the Endangered Species Act and/or Marine Mammal Protection Act that May Occur in the Operations Area for the FY 2013 Sectors[a]

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

Notes:

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

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

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

4.5.2 Species and Habitats Not Likely to be Affected

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

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

The wild populations of Atlantic salmon are listed as endangered under the ESA. It is highly unlikely that the action being considered will affect the Gulf of Maine DPS of Atlantic salmon given that operation of the multispecies fishery does not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found. Additionally, multispecies gear operates in the ocean at or near the bottom rather than near the surface where Atlantic salmon are likely to occur. Thus, this species will not be considered further in this EA.

North Atlantic right whales occur in coastal and shelf waters in the western North Atlantic (NMFS 2005). Section 4.5.2.2 of the FY 2013 Sector Operations and Contracts EA discusses potential fishery entanglement and mortality interactions with North Atlantic right whale individuals. As discussed in the FY 2013 Sector Operations and Contracts EA and further in Section 5.1.1, the proposed action would result in a negligible effect on physical habitat. Therefore, the proposed action would not result in a significant impact on North Atlantic right whale critical habitat. Further, mesh sizes used in the multispecies fishery do not significantly impact the Northern right whale's planktonic food supply (59 FR 28793). Therefore, right whale food sources in areas designated as critical habitat would not be adversely affected by sectors. For these reasons, right whale critical habitat will not be considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Therefore, it is highly unlikely that sector operations would affect this turtle species.

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2002). The species is unlikely to occur in areas where the sectors would operate, and sector operations would not affect the availability of blue whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the U.S. EEZ. However, the distribution of the sperm whales in the U.S. EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2007). Sperm whales are unlikely to occur in water depths where the sectors would operate, sector operations would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect sperm whales.

Although marine turtles and large whales could be potentially affected through interactions with fishing gear, NMFS has determined that the continued authorization of the multispecies fishery, and therefore the FY 2013 sectors, would not have any adverse effects on the availability of prey for these species. Sea turtles feed on a variety of plants and animals, depending on the species. However, none of the turtle

species are known to feed upon groundfish. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The multispecies fishery will not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that will pass through multispecies fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish such as sand lance, herring and mackerel (Aguilar 2002, Clapham 2002). Multispecies fishing gear operates on or very near the bottom. Fish species caught in multispecies gear are species that live in benthic habitat (on or very near the bottom) such as flounders. As a result, this gear does not typically catch schooling fish such as herring and mackerel that occur within the water column. Therefore, the continued authorization of the multispecies fishery or the approval of the FY 2013 sector operations plans will not affect the availability of prey for foraging humpback or fin whales.

4.5.3 Species Potentially Affected

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

4.5.3.1 ATLANTIC STURGEON

There are five distinct population segments of Atlantic sturgeon: Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic. All five distinct population segments share a common marine range although the distribution of each may vary within that range as evidenced by genetics analyses. Atlantic sturgeon occur primarily in waters less than 50m (although deeper waters are also used), aggregate in certain areas, and exhibit seasonal movement patterns (Stein et al (2004), Dunton et al (2010), Erickson et al (2011)). Currently, the Gulf of Maine DPS is listed as threatened and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs are listed as endangered. Atlantic sturgeon from any of the five DPSs could occur in areas where the multispecies fishery operates Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein *et al*. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon (ASMFC TC 2007). Sturgeon deaths were rarely reported in the otter trawl observer dataset (ASMFC TC 2007). The last stock assessment for Atlantic sturgeon was completed by the ASMFC in 1998. NMFS and ASMFC have declared plans to conduct an Atlantic. sturgeon stock assessment with targeted completion in 2014..

Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon.

Since the ESA listing of Atlantic sturgeon, the NEFSC has completed new population estimates, in part, using data from the Northeast Area Monitoring and Assessment (NEAMAP) survey (Kocik et al. 2013). Atlantic sturgeon are frequently sampled during the NEAMAP survey. NEAMAP has been conducting trawl surveys from Cape Cod, Massachusetts to Cape Hatteras, North Carolina in nearshore waters at depths to 18.3 meters (60 feet) during the fall since 2007 and during the spring since 2008 using a spatially stratified random design with a total of 35 strata and 150 stations per survey. The information from this survey can be directly used to calculate minimum swept area population estimates during the fall, which range from 6,980 to 42,160 with coefficients of variation between 0.02 and 0.57 and during the spring, which range from 25,540 to 52,990 with coefficients of variation between 0.27 and 0.65. These are considered minimum estimates because the calculation makes the unlikely assumption that the

gear will capture 100% of the sturgeon in the water column along the tow path. Efficiencies less than 100% will result in estimates greater than the minimum. The true efficiency depends on many things including the availability of the species to the survey and the behavior of the species with respect to the gear. True efficiencies much less than 100% are common for most species. The NEFSC's analysis calculated estimates based on a range of sampling efficiencies from 5-100%. For this analysis, NMFS has determined that the best available scientific information for the status of Atlantic sturgeon at this time are the population estimates derived from NEAMAP swept area biomass (Kocik et al. 2013) because the estimates are derived directly from empirical data with few assumptions. NMFS has determined that using the median value of the 50% efficiency as the best estimate of the Atlantic sturgeon ocean population is most appropriate at this time. This results in a total population size estimate of 67,776 fish, which is considerably higher than the estimates that were available at the time of listing. This estimate is the best available estimate of Atlantic sturgeon abundance at the time of this analysis. The ASMFC has begun work on a benchmark assessment for Atlantic sturgeon to be completed in 2014, which would be expected to provide an updated population estimate and stock status. The ASMFC is currently collecting public submissions of data for use in the assessment: http://www.asmfc.org/press_releases/2013/pr20AtlSturgeonStockAssmtPrep.pdf.

4.5.4 Interactions Between Gear and Protected Resources

Marine Mammals

NMFS categorizes commercial fisheries based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each marine mammal stock. NMFS bases the system on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a marine mammal stock's PBR level. Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries. Tier 2 considers marine mammal mortality and serious injury caused by the individual fisheries. This EA uses Tier 2 classifications to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals (NMFS 2009b). Table 22 identifies the classifications used in the final List of Fisheries for FY 2012 (76 FR 73912; November 29, 2011; NMFS 2011), which are broken down into Tier 2 Categories I, II, and III.

Table 22. Descriptions of the Tier 2 Fishery Classification Categories (50 CFR 229.2)

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

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

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

- becoming caught on hooks (bottom longlines)
- entanglement in mesh (gillnets and trawls)
- entanglement in the float line (gillnets and trawls)
- entanglement in the groundline (traps/pots, gillnets, trawls, and bottom longlines)
- entanglement in anchor lines (gillnets and bottom longlines), or
- entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets, traps/pots, and bottom longlines).

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

Table 23 lists the marine mammals known to have had interactions with gear used by the Northeast Multispecies fishery. This gear includes sink gillnets, traps/pots, bottom trawls, and bottom longlines within the Northeast Multispecies region, as excerpted from the List of Fisheries for FY 2012 ([76 FR 73912; November 29, 2011], also see Waring et al. 2012). Sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. There are no observed reports of interactions between bottom longline gear used in the Multispecies fishery and marine mammals in FY 2009 through FY 2011. However, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

Table 23. Marine Mammal Species and Stocks Incidentally Killed or Injured Based on Northeast Multispecies Fishing Areas and Gear Types (based on 2012 List of Fisheries)

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	Type		
Category I	Mid-Atlantic gillnet	6,402	Bottlenose dolphin, Northern Migratory coastal [a] Bottlenose dolphin, Southern Migratory coastal [a] Bottlenose dolphin, Northern NC estuarine system [a] Bottlenose dolphin, Southern NC estuarine system [a] Bottlenose dolphin, WNA offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Humpback whale, Gulf of Maine Long-finned pilot whale, WNA Minke whale, Canadian east coast Short-finned pilot whale, WNA White-sided dolphin, WNA
	Northeast sink gillnet	3,828	Bottlenose dolphin, WNA, offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, GOM Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA White-sided dolphin, WNA

Table 23 **(continued)** **Marine Mammal Species and Stocks Incidentally Killed or Injured Based on Northeast Multispecies Fishing Areas and Gear Types (based on 2012 List of Fisheries)**			
Fishery		**Estimated Number of Vessels/Persons**	**Marine Mammal Species and Stocks Incidentally Killed or Injured**
Category	**Type**		
Category II	Mid-Atlantic bottom trawl	1,388	Bottlenose dolphin, WNA offshore Common dolphin, WNA [a] Long-finned pilot whale, WNA [a] Risso's dolphin, WNA Short-finned pilot whale, WNA [a] White-sided dolphin, WNA
	Northeast bottom trawl	2,584	Common dolphin, WNA Harbor porpoise, GOM/ Bay of Fundy Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA [a]
	Atlantic mixed species trap/pot [c]	3,526	Fin whale, WNA Humpback whale, GOM
Category III	Northeast/Mid-Atlantic bottom longline/hook-and-line	>1,281	None documented in recent years

Notes:

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

Table 24 shows trends in marine mammal and ESA listed species takes from FY 2009 to FY 2011 (fishing years as opposed to calendar years) as recorded in the ASM and observer program data. This data comes from trips that were potentially using sector ACE.

Table 24. Marine Mammal and ESA listed Species Observed Taken By Gear as Recorded in ASM and Observer Program

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

(***Universe: Trips Potentially Using Sector ACE in FY 2009-FY2011 Data as of: October 18, 2012)***

Marine mammals are taken in gillnets, trawls, and trap/pot gear used in the Northeast Multispecies area. Documented marine mammal interactions in Northeast sink gillnet and Mid-Atlantic gillnet fisheries include harbor porpoise, white-sided dolphin, harbor seal, gray seal, harp seal, hooded seal, pilot whale, bottlenose dolphin (various stocks), Risso's dolphin, and common dolphin. Table 25 and Table 26 summarize the estimated mean annual mortality of small cetaceans and seals that are taken in the Northeast sink gillnet and Mid-Atlantic gillnet fisheries according to the most recent SAR for each particular species.

Documented marine mammal interactions with Northeast and Mid-Atlantic bottom trawl fisheries include minke whale, harbor porpoise, white-sided dolphin, harbor seal, gray seal, harp seal, pilot whale, and common dolphin. Table 27 and Table 28 provide the estimated mean annual mortality of small cetaceans and seals that are taken in the Northeast and Mid-Atlantic bottom trawl fisheries, based on the most recent SAR for each particular species. The data in these tables are based on takes observed by fishery observers as part of the Northeast Fisheries Observer Program (NEFOP).

Table 25. Estimated Marine Mammal Mortalities in the Northeast Sink Gillnet Fishery

Species	**Years Observed**	**Mean Annual Mortality (CV)**	**Total PBR**
Harbor porpoise	05-09	559 (0.16)	701
Atlantic white-sided dolphin	05-09	36 (0.34)	190
Common dolphin (short-beaked)	05-09	26 (0.39)	1,000
Risso's dolphin	05-09	3 (0.93)	124
Western North Atlantic Offshore bottlenose dolphin	02-06	Unknown[+]	566
Harbor seal	05-09	332 (0.14)	Undetermined
Gray seal	05-09	678 (0.14)	Undetermined
Harp seal	05-09	174 (0.18)	Unknown
Hooded seal	01-05	25 (0.82)	Unknown

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

Table 26. Estimated Marine Mammal Mortalities in the Mid-Atlantic Gillnet Fishery

Species	Years Observed	Mean Annual Mortality (CV)	Total PBR
Harbor porpoise	05-09	318 (0.26)	701
Common dolphin (short-beaked)	05-09	2.2 (1.03)	1,000
Risso's dolphin	05-09	7 (0.73)	124
Bottlenose dolphin	06-08		
Western North Atlantic Northern Migratory Coastal stock		5.27 (0.19) min; 6.02 (0.19) max	71
Western North Atlantic Southern Migratory Coastal stock	06-08	5.71 (0/31 min; 41.91 (0.14) max	96
Northern North Carolina Estuarine System stock	06-08	2.39 (0.25) min; 18.99 (0.11) max	Undetermined
Southern North Carolina Estuarine System stock	06-08	0.61 (0.30) min; 0.92 (0.21) max Unknown+	16
Western North Atlantic Offshore stock	02-06		566
Harbor seal	05-09	45 (0.39)	Undetermined
Harp seal	05-09	57 (0.5)	Unknown

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

Table 27. Estimated Marine Mammal Mortalities in the Northeast Bottom Trawl Fishery

Species	Years Observed	Mean Annual Mortality (CV)	Total PBR
Minke whale	05-09	3.5 (0.34)	69
Harbor porpoise	05-09	6 (0.22)	701
Atlantic white-sided dolphin	05-09	160 (0.14)	190
Common dolphin (short-beaked)	05-09	23 (0.13)	1,000
Pilot whales*	05-09	12 (0.14)	93 (long-finned); 172 (short-finned)
Harbor seal	05-09	Unknown+	Undetermined
Gray seal	05-09	Unknown+	Undetermined
Harp seal	05-09	Unknown+	Unknown

Source: Waring et al. (2012)
*Total fishery-related serious injuries and mortalities to pilot whales (*Globicephala* sp.) cannot be differentiated to species due to uncertainty in species identification by fishery observers (Waring et al. 2012). However, separate PBRs have been calculated for long-finned and short-finned pilot whales.
+While there have been documented interactions between these species and the Northeast bottom trawl fishery during the five year time period, estimates of bycatch mortality in the fishery have not been generated.

Table 28. Estimated Marine Mammal Mortalities in the Mid-Atlantic Bottom Trawl Fishery

Species	Years Observed	Mean Annual Mortality (CV)	Total PBR
Atlantic white-sided dolphin	05-09	23 (0.12)	190
Common dolphin (short-beaked)	05-09	110 (0.13)	1,000
Pilot whales*	05-09	30 (0.16)	93 (long-finned); 172 (short-finned)

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

Takes of large whales are typically not documented within observer records as large whales are typically entangled in fixed fishing gear and the chances of observing an interaction are small. Although large whales can become anchored in gear, they more often swim off with portions of the fishing gear; therefore, documentation of their incidental take is based primarily on the observation of gear or markings on whale carcasses, or on whales entangled and observed at-sea. Even if a whale is anchored in fishing gear, it is extremely difficult to make any inferences about the nature of the entanglement event and initial interaction between the whale and the gear. Frequently, it is difficult to attribute a specific gear type to an entangled animal based on observed scars or portions of gear remaining attached to whales or their carcasses; however, gillnet gear has been identified on entangled North Atlantic right whales, humpback whales, fin whales, and minke whales. Minke whales have been observed to be taken in the Northeast bottom trawl fishery by fishery observers. The annual estimated mortality and serious injury to minke whales from this fishery was 3.5 (CV = 0.34) between 2005 and 2009 (Waring et al. 2012). At this time, there is no evidence suggesting that other large whale species interact with trawl gear fisheries.

A number of marine mammal management plans are in place along the U.S. east coast to reduce serious injuries and deaths of marine mammals due to interactions with commercial fishing gear. Multispecies fishing vessels are required to adhere to measures in the Atlantic Large Whale Take Reduction Plan (ALWTRP), which manages from Maine through Florida, to minimize potential impacts to certain cetaceans. The ALWTRP was developed to address entanglement risk to right, humpback, and fin whales, and to acknowledge benefits to minke whales in specific Category I or II commercial fishing efforts that utilize traps/pots and gillnets. This includes the Northeast sink gillnet and Mid-Atlantic gillnet fisheries. The ALWTRP calls for the use of gear markings, area restrictions, weak links, and sinking groundline. Fishing vessels would be required to comply with the ALWTRP in all areas where gillnets were used. A Take Reduction Strategy is in place that recommends voluntary measures for reducing interactions of these species with trawl gear. These measures are: 1) to reduce the number of turns made by the fishing vessel and tow times while fishing at night; and 2) increase radio communications between vessels about the presence and/or incidental capture of a marine mammal to alert other fishermen of the potential for additional interactions in the area. More information about trawl gear interactions with marine mammals can be found here: http://www.nero.noaa.gov/prot_res/atgtrp/G-NMFS-GSSA.pdf.

Fishing vessels would also be required to comply, where applicable, with the seasonal gillnet requirements of the Bottlenose Dolphin Take Reduction Plan (BDTRP), which manages coastal waters from New Jersey through Florida, and Harbor Porpoise Take Reduction Plan (HPTRP), which manages coastal and offshore waters from Maine through North Carolina. The BDTRP spatially and temporally restricts night time use of gillnets and requires net tending in the Mid-Atlantic gillnet region. The HPTRP aims to reduce interactions between harbor porpoises and gillnets in the Gulf of Maine, southern New England, and Mid-Atlantic regions. The New England component of the

HPTRP includes time/area closures, seasonal area-based gear modification requirements (acoustic alarms also known as pingers), a consequence closure strategy, and one-time required pinger training after which an authorization is issued which must be on the vessel while fishing in pinger areas.

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

Sea Turtles

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

Atlantic Sturgeon

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

In an updated, preliminary analysis, the Northeast Fisheries Science Center (NEFSC) was able to use data from the NEFOP database to provide updated estimates for the 2006 to 2010 timeframe. Data were limited by observer coverage to waters outside the coastal boundary (fzone>0) and north of Cape Hatteras, NC. Sturgeon included in the data set were those identified by federal observers as Atlantic sturgeon, as well as those categorized as unknown sturgeon.

The preliminary analysis apportioned the estimated total sturgeon takes to specific fishery management plans. The analysis estimates that between 2006 and 2010, a total of 15,587 Atlantic

sturgeon were captured and discarded in bottom otter trawl (7,740 sturgeon) and sink gillnet (7,848 sturgeon) gear. The analysis results indicate that 7.1% (550 sturgeon) of sturgeon discards in bottom otter trawl gear could be attributed to the large mesh groundfish bottom trawl fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort. Additionally, the analysis results indicate that 4.0% (314 sturgeon) of sturgeon discards in sink gillnet gear could be attributed to the large mesh groundfish gillnet fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort.

These additional data support the conclusion from the earlier bycatch estimates that the multispecies fishery may interact with Atlantic sturgeon. Since the Atlantic sturgeon DPSs have been listed as endangered and threatened under the ESA, the ESA Section 7 consultation for the multispecies fishery will be reinitiated, and additional evaluation will be included in the resulting Biological Opinion to describe any impacts of the fisheries on Atlantic sturgeon and define any measures needed to mitigate those impacts, if necessary. It is anticipated that any measures, terms and conditions included in an updated Biological Opinion will further reduce impacts to the species.

On February 6, 2012, NMFS published two final rules listing the GOM distinct population segment (DPS) of Atlantic sturgeon as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon as endangered, effective April 6, 2012. Preliminary analysis indicates that multiple Atlantic sturgeon DPSs may be affected by the continued operation of the NE multispecies fishery. Formal consultation under section 7 of the ESA has been reinitiated and is ongoing for the NE multispecies fishery. The previous Biological Opinion (BO) for the NE multispecies fishery completed in October 2010 concluded that the actions considered would not jeopardize the continued existence of any listed species. This BO will be updated and additional evaluation will be included to describe any impacts of the NE multispecies fishery on Atlantic sturgeon DPSs, and define any measures needed to mitigate those impacts, if necessary. Any measures and terms and conditions included in an updated BO are anticipated to further reduce impacts to the species. While it is likely that there will be interactions between Atlantic sturgeon and gear used in the groundfish fisheries, the amount of interactions attributable to this fishery that will occur between now and the time a final BO will be published is not likely to cause an appreciable reduction in survival and recovery of any of the five DPSs. An August 28, 2012, memorandum explained our determination that allowing these fisheries and associated research to continue during the reinitiation period will not violate ESA sections 7(a)(2) and 7(d). This determination may be revised if an updated Biological Opinion is received.

4.6 HUMAN COMMUNITIES/SOCIAL-ECONOMIC ENVIRONMENT

This EA considers additional exemptions for the operation of the FY 2013 sectors and evaluates the effect sectors may have on people's way of life, traditions, and community. These social impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. While it is possible that social 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 this action also considers complimentary changes to the lobster regulations an overview of that fishery is included as well.

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

The exclusion of the foreign fishermen by the Fisheries Conservation and Management Act in 1976, coupled with technological advances, government loan programs, and some strong classes of cod and haddock, caused a rapid increase in the number and efficiency of U.S. vessels participating in the Northeast groundfish fishery in the late 1970's. This shift resulted in a temporary increase in domestic groundfish landings; however, overall landings (domestic plus foreign) continued to trend

downward from about 200,000 tons (181,437 mt) to about 100,000 tons (90,718 mt) through the mid 1980's (NOAA 2007).

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

In 2004, the final rule implementing Amendment 13 to the Northeast Multispecies FMP allowed for self-selecting groups of limited access groundfish permit holders to form sectors. These sectors developed a legally binding operations plan and operated under an allocation of GB cod. While approved sectors were subject to general requirements specified in Amendment 13, sector members were exempt from DAS and some of the other effort control measures that tended to limit the flexibility of fishermen. The 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 include 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 58% 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.

4.6.2 Trends in the Number of Vessels

In 2010, the first year of sector management, the Northeast Multispecies fishery issued 1,382 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 640 remained in the Common Pool. Not all permitted vessels were active and not all active vessels fished groundfish. Of the 740 sector vessels issued groundfish permits, only 440 were considered active, having revenue from any landed species, and only 303 of those had revenue from at least one groundfish trip. Among common pool vessels, 456 were considered active, and only 142 vessels had made at least one groundfish trip.

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 518. Of the 772 sector vessels issued a groundfish permit in 2011, 446 were considered active, and only 301 of those had revenue from at least one groundfish trip. Among common pool vessels, 366 were considered active, and only 121 vessels had made at least one groundfish trip.

Table 29. Number of vessels by fishing year

	2007	2008	2009	2010			2011		
				Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool
Vessels with a limited access groundfish permit	1413	1410	1431	1382	753	640	1279	772	518
... those with revenue from any species	1082	1012	957	890	440	456	805	446	366
... those with revenue from at least one groundfish trip	658	611	570	445	303	142	420	301	121
... those with no landings	331 (32%)	398 (28%)	474 (33%)	492 (36%)	313 (42%)	184 (29%)	474 (37%)	326 (42%)	152 (30%)

* 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 and 2011 data for either sector or common pool.

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 vessels exiting the fishery. In 2010, 492 vessels (36%) were inactive (no landings). Of these inactive vessels, 313 were sector vessels and 184 were common pool vessels. By 2011 the total number of inactive vessels had declined to 474 but because the number of vessels with a limited access groundfish permit declined, there was only a slight rise in the relative proportion of inactive vessels (37%). The number of inactive sector vessels increased to 326 in 2011, but again because the number of vessels with a limited access groundfish permit belonging to a sector also increased, the relative proportion of inactive sector vessels (42%) remained the same. 152 common pool vessels were inactive in 2011, which is about 30% of the Common Pool. The number of inactive vessels in 2011 can be compared to the number of inactive vessels in other years: 331 vessels (32%) in 2007, 398 vessels (28%) in 2008, and 474 vessels (33%) in 2009.

4.6.3 Trends in Landings

Total groundfish landings on trips made by vessels possessing a limited access groundfish permit in 2011 were 61.7 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 178.1 million pounds in 2010 to 213.8 million pounds in 2011. Total landings of all species made by limited access vessels in the Northeast Multispecies fishery was about 275.5 million pounds in 2011. This compares to landings ranging from 259.5 million pounds to 277.1 million pounds in the 2007–2010 fishing years (Table 30). While sector vessels accounted for 69% of all landings made in 2011, sector vessels also made 99% of groundfish landings and 60% of non-groundfish landings.

Table 30. Landings in Thousands of Pounds by Year

				2010			2011		
Landings	2007	2008	2009	Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool
Total Landings	259448	277118	258954	236695	155529	81166	275506	85147	5580
Total Groundfish Landings	64004	72162	69775	58622	57217	1404	61721	61038	471
Total Non-groundfish Landings	195444	204955	189180	178073	98312	79762	213785	24108	5109

Combined, 161 million (live) pounds of ACE was allotted to the sectors in 2011 but only 70 million (live) pounds were landed. Of the 16 ACEs allocated to sectors, the catch of 7 stocks approached (>80% conversion) the catch limit set by the total allocated ACE (Table 31). By comparison, the catch of only 5 stocks approached the catch limit set by the total allocated ACE in 2010. The catch of white hake in 2011 was particularly close to reaching the limit, with 98% of the white hake ACE being realized. As was the case in 2010, the majority of the unrealized landings in 2011 were caused by a failure to land Georges Bank haddock. Collectively, East and West GB haddock, accounted for 63 million pounds (62%) of the un-landed ACE in 2011.

Table 31. Catch and ACE (live lbs)

	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%***	**11,242,220**	**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%*
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 FY2010 carryover

Notes: stocks with > 80% ACE conversion highlighted in bold font

4.6.4 Trends in Revenue

During the first year of sector management, groundfish revenues from vessels with limited access groundfish permits in 2010, were $83 million. This was lower than 2007 – 2009 nominal revenues which ranged from $84.1 million in 2009 to $90.1 million in 2008. By 2011 the groundfish revenues from vessels with limited access groundfish permits had risen to $90.1 million. During the same time Non-groundfish revenues in 2011 were $240.7 million. Non-groundfish revenues from 2007 – 2010 ranged from $186.1 million in 2009 to $211.5million in 2010. Revenues from all species for 2011 totaled $330.8 million, which compares to pervious revenues that ranged from a low of $271.1 million in 2009 to a high of $298.2 million in 2007. Sector vessels accounted for about 71% of all revenue earned by limited access permitted vessels in 2011. Sector vessels also earned 99% of revenue from groundfish landings and 60% of non-groundfish revenue.

Table 32. Revenue in Thousands of Dollars by Year

				2010			2011		
Landings	2007	2008	2009	Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool
Total Landings	$298,246	$291,479	$266,765	$294,505	$196,625	$97,880	$330,885	$233,922	$96,962
Total Groundfish Landings	$89,055	$90,132	$84,112	$82,984	$80,750	$2,234	$90,115	$89,144	$971
Total Non-groundfish Landings	$209,191	$201,347	$182,653	$211,521	$115,875	$95,645	$240,769	$144,778	$95,991

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, 281 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 million pounds of ACE and/or PSC with an approximate value of $13.5 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 31 million pounds of quota, either as PSC from within the sector or as ACE from another sector. Although the number of vessels leasing ACE fell by 9% the estimated number of pounds leased was almost 41% greater in 2011 than in 2010.

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. Between 2009 and 2010, the total number of groundfish fishing trips and total days absent on groundfish trips declined by 48% and 27%, respectively (26,056 trips in 2009 vs. 13,441 trips in 2010; 24,237 days absent in 2009 vs. 17,614 days absent in 2010) (Table 33). During the second year of sector management, 2011, the number of groundfish fishing trips and total days absent on groundfish trips increased by 19% and 18% respectively (13,441 trips in 2010 vs. 15,929 trips in 2011; 17,614 days absent in 2010 vs. 20,724 days absent in 2011) (Table 33). Note, in the following analysis, 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 following data 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. While the number of groundfish fishing trips and total days absent on groundfish trips increased during the second year of sector management the number of non-groundfish trips, and days absent on non-groundfish trips, has decreased in 2011 (41,753 trips in 2010 vs. 36,386 trips in 2011; 31,552 days absent in 2010 vs. 27,913 days absent in 2011) (Table 33). Average trip length on both groundfish and non-groundfish trips were not statistically different during the time series (Table 33).

Table 33. Effort by Active Vessels

	2007	2008	2009	2010			2011		
				Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool
Number of Groundfish Trips	27,004	26,468	26,056	13,441	11,159	2,282	15,929	13,642	2,287
Number of non-groundfish Trips	46,635	46,721	39,943	41,753	16,791	24,962	36,386	17,002	19,384
Number of days absent on groundfish trips	28,158	27,146	24,237	17,614	16,057	1,558	20,724	19,227	1,498
Number of days absent on non-groundfish trips	35,186	36,134	31,241	31,552	15,446	16,106	27,913	14,973	12,940
Average trip length on groundfish trips	7.63	7.82	0.94	1.31	1.44	0.69	1.30	1.41	0.66
(standard deviations)	(6.15)	(5.98)	(1.85)	(2.08)	(2.23)	(0.76)	(2.14)	(2.28)	(0.66)
Average trip length on non-groundfish trips	5.42	4.78	0.84	0.79	0.96	0.68	0.80	0.93	0.69
(standard deviation)	(5.95)	(5.67)	(1.57)	(1.47)	(1.69)	(1.30)	(1.45)	(1.65)	(1.24)

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. The groundfish fleet is divisible 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 mentioned above, the number of active vessels in 2011 had declined compared to the previous three years and this decline occurred across all vessel size categories between 2009 and 2011. The number of vessels smaller than 30' has experienced the greatest decline of 32% between 2009 and 2011 (78 to 53 vessels). The 30' to < 50' vessel size category, which has the largest number of active vessels, experienced a 16% decline (500 to 419 active vessels) during the past 3 years. Most (229) 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 an 11% reduction during 2009 to 2011 (247 to 220 active vessels). The 50' to < 75' size category also had the second largest number of sector vessels with 128. The number of active vessels in largest (75' and above) vessel size category declined by 9% between 2009 and 2011. The decline was relatively consistent across all four years in all vessel size categories.

Between the first two years of sector management, the numbers of vessels that joined a sector or stayed in the common pool were about evenly split within size categories with the exception of the largest and smallest categories. For active vessels larger than 75' total length, 67% belong to a sector in 2010 and 69% belong to a sector in 2011. Of active vessels in the smallest size category, those smaller than 30' in length, 84% remained in the common pool in 2010 while 89% of vessels smaller than 30' remained in the common pool in 2011. For active vessels in the 30' to 50' and 50' to 75' range there has been a growing proportion of vessels belonging to sectors. In 2010, active sector vessels comprised 47% and 54% of the 30' to 50' and 50' to 75' ranges respectively. By 2011, those proportions had increased to 55% and 58% of active sector vessels in the 30' to 50' and 50' to 75' ranges.

Table 34. Vessel activity by size class

				2010			2011		
Vessel size	**2007**	**2008**	**2009**	**Total**	**Sector Vessels**	**Common Pool**	**Total**	**Sector Vessels**	**Common Pool**
Vessels with landings from any species									
Less than 30	83	77	78	70	11	59	53	6	47
30 to < 50	572	528	500	475	225	250	419	229	190
50 to < 75	289	267	247	231	125	106	220	128	92
75 and above	139	140	132	120	79	41	120	83	37
Total	1082	1012	957	896	440	456	812	446	366
Vessels with at least one groundfish trip									
Less than 30	29	26	33	23	2	21	19	1	18
30 to < 50	351	331	308	241	152	89	220	146	74
50 to < 75	194	175	156	117	88	29	115	92	23
75 and above	84	79	73	64	61	3	68	62	6
Total	658	611	570	445	303	142	422	301	121

Fishing effort, as described by either the number of trips taken or the total number of days absent, varies considerably by vessel size. In 2011 more than two thirds of groundfish trips were made by vessels ranging in size from 30 to 50 feet in total length. Compared to 2010, 2011 saw increases in the numbers of groundfish trips and the total number of days absent on groundfish trips across almost all vessel size classes. In percentage terms, the largest increases in groundfish trips and days absent on groundfish trips occurred in the less than 30' vessel size category (100% and 69%, respectively).

However, there were only a couple hundred trips per year in this vessel size category. In terms of magnitude, the 30' to < 50' vessel size category had the greatest increases in groundfish trips and days absent (1,874 more groundfish trips and 1,265 more days absent on groundfish trips from 2010 to 2011). The largest vessel class (75' and above) experienced a reduction of 5% in groundfish trips but an 11% increase in days absent on groundfish trips. The 50' to < 75' vessel size category had increases of about 19% in both groundfish trips and days absent on groundfish trips. From 2010-2011, non-groundfish trips and the number of days absent on non-groundfish trips, has declined for all vessel size classes.

Table 35. Vessel effort (as measured by number of trips and days absent) by vessel size category

				2010			2011		
Vessel Size	**2007**	**2008**	**2009**	**Total**	**Sector Vessels**	**Common Pool**	**Total**	**Sector Vessels**	**Common Pool**
Number of groundfish trips									
Less than 30	272	239	435	137	2	135	274	15	259
30 to < 50	18200	18453	19349	9240	7509	1731	11114	9401	1713
50 to < 75	7018	6356	4971	2829	2442	387	3368	3067	301
75 and above	1525	1424	1301	1235	1206	29	1173	1159	14
Total	27015	26472	26056	13441	11159	2282	15929	13642	2287
Number of non-groundfish trips									
Less than 30	2534	2249	1784	1703	370	1333	1372	258	1114
30 to < 50	28892	27586	23216	25204	9678	15526	21585	10443	11142
50 to < 75	11979	12825	12090	12321	5456	6865	10920	5036	5884
75 and above	3248	4073	2853	2523	1287	1236	2507	1264	1243
Total	46653	46733	39943	41751	16791	24960	36384	17001	19383
Number of days absent on groundfish trips									
Less than 30	101	82	160	61	1	60	103	7	96
30 to < 50	9580	9586	8794	5067	3958	1109	6332	5216	1116
50 to < 75	10701	9857	8278	5656	5305	351	6713	6447	266
75 and above	7750	7582	7006	6831	6792	38	7576	7558	19
Total	28132	27107	24237	17614	16057	1558	20724	19227	1498
Number of days absent on non-groundfish trips									
Less than 30	665	678	573	537	123	414	419	81	337
30 to < 50	11069	10455	8657	9540	3633	5906	8215	3683	4532
50 to < 75	13006	13557	12681	12545	6491	6053	11498	6414	5084
75 and above	10472	11483	9330	8930	5199	3731	7780	4795	2986
Total	35212	36173	31241	31551	15446	16105	27912	14972	12940

4.6.8 Fishing Communities

There are over 100 communities that are homeport to one or more Northeast groundfishing 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. Section 4.6.8.identifies the most important communities involved in the multispecies fishery. .

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 and that information can easily be attributed to a particular vessel or individual.

4.6.8.1 Vessel Activity

At the state level, Massachusetts has the highest number of active vessels with a limited access groundfish permit. From 2007 to 2011 the total number of active vessels with revenue from any species on all trips declined 26% (1,082 to 805). All states have shown a decline in the number of active vessels since 2007, but the largest percentage decline has occurred in Connecticut where the number of active vessels dropped 39% by 2011 (Table 36). Just over half of the active vessels belonging to a sector have a homeport in Massachusetts (262 vessels), while New Jersey and Connecticut are the two states in the North East with the fewest vessels belonging to a sector. At the level of home port, there is even greater variation between the ports with regard to the numbers of active vessels.

Table 36. Number of Active Vessels with Revenue from any Species (all trips) by Home Port and State

		Year								
					2010			2011		
Home Port State/City		2007	2008	2009	Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool
CT		18	13	13	12	4	8	11	4	7
MA		544	502	482	444	264	183	396	262	134
	BOSTON	80	69	67	57	41	16	53	41	12
	CHATHAM	46	41	42	43	31	12	39	28	11
	GLOUCESTER	124	116	115	109	70	39	95	68	27
	NEW BEDFORD	93	91	87	69	48	22	70	53	17
ME		128	116	114	103	63	40	88	70	20
	PORTLAND	22	18	17	17	15	2	16	15	1
NH		70	65	62	57	37	22	52	34	20
NJ		67	71	63	58	2	56	52	6	46
NY		98	100	97	95	15	80	92	16	76
RI		110	104	95	87	43	45	84	44	41
	POINT JUDITH	58	54	50	46	33	14	45	34	12
All Other States		47	41	35	39	13	26	37	14	23
Grand Total		1,082	1,012	957	890	440	456	805	446	366

Massachusetts is also the state with the highest number of active vessels with revenue from at least one groundfish trip. From 2007 to 2011 the total number of active vessels with revenue from at least one groundfish trip declined 36% (658 to 420). While all states showed a decline in the number of vessels making groundfish trips the largest percentage decline (59%: 41 to 17 vessels) occurred in New Jersey (Table 37). Of the sector vessels making groundfish trips in 2011 almost two thirds of them have a homeport in Massachusetts (186 vessels). Again, New Jersey and Connecticut are the two states with the fewest sector vessels making groundfish trips.

Table 37. Number of Vessels with Revenue from at Least One Groundfish Trip by Home Port and State

		Year								
					2010			2011		
Home Port State/City		2007	2008	2009	Total	Sector Vessels	Common Pool	Total	Sector Vessels	Common Pool
CT		9	8	8	7	3	4	5	2	3
MA		341	321	312	238	189	49	224	186	38
	BOSTON	54	49	46	35	33	2	34	34	0
	CHATHAM	26	27	28	26	23	3	26	23	3
	GLOUCESTER	95	88	98	74	59	15	70	55	15
	NEW BEDFORD	60	62	52	33	29	4	37	32	5
ME		78	69	65	43	38	5	47	43	4
	PORTLAND	20	16	15	15	14	1	15	15	0
NH		44	42	42	32	26	6	29	23	6
NJ		41	34	26	21	1	20	17	1	16
NY		52	56	47	40	8	32	43	9	34
RI		78	70	60	55	34	21	49	32	17
	POINT JUDITH	43	36	32	31	28	3	28	27	1
All Other States		15	11	12	10	5	5	8	5	3
Grand Total		658	611	570	445	303	142	420	301	121

4.6.8.2 Employment

Along with the restrictions associated with presenting confidential information there is also limited quantitative socio-economic data upon which to evaluate the community specific importance of the multispecies fishery. In addition to the direct employment of captains and crew, the industry is known to support ancillary businesses such as gear, tackle, and bait suppliers; fish processing and transportation; marine construction and repair; and restaurants. Regional economic models do exist that describe some of these inter-connections at that level (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 2011 vessels with limited access groundfish permits provided 2,129 crew positions with about half coming from vessels with home ports in Massachusetts. Since 2007, the total number of crew positions provided by limited access groundfish vessels has declined by 21% (2,687 positions to 2129). Declines in crew positions vary across home port states with some states adding crew positions in 2011 (Table 38). Vessels with a home port in Connecticut and New Hampshire have experienced the largest percentage decline (20%: 52 to 41 crew positions in CT and 28%: 139 to 100 crew positions in NH), while vessels home ported in New York have shown an increase in crew positions (3%: 204 to

211 crew positions). All other home port states had crew position reductions ranging from 10 to 18% between 2007 and 2011 (Table 38).

Table 38. Number of Crew Positions and Crew-Days on Active Vessels by Home Port and State

Home Port State		Year				
		2007	2008	2009	2010	2011
CT						
	Total CREW POSITIONS	52	39	38	39	41
	Total CREW-DAYS	4,261	3,779	3,317	3,614	3,067
MA						
	Total CREW POSITIONS	1,402	1,311	1,152	1,104	1,063
	Total CREW-DAYS	98,094	93,182	86,234	77,422	82,238
ME						
	Total CREW POSITIONS	276	250	216	220	204
	Total CREW-DAYS	17,872	15,882	14,414	14,427	14,148
NH						
	Total CREW POSITIONS	139	123	114	109	100
	Total CREW-DAYS	6,443	6,135	5,925	3,813	4,663
NJ						
	Total CREW POSITIONS	167	185	159	140	143
	Total CREW-DAYS	12,035	12,987	10,708	9,801	9,364
NY						
	Total CREW POSITIONS	204	214	205	201	211
	Total CREW-DAYS	16,656	15,975	15,479	15,020	15,439
RI						
	Total CREW POSITIONS	304	281	253	243	238
	Total CREW-DAYS	32,072	29,690	24,167	25,454	24,938
OTHER NORTHEAST						
	Total CREW POSITIONS	145	144	123	133	128
	Total CREW-DAYS	12,158	14,794	12,166	11,626	11,767
Total						
	Total CREW POSITIONS	2,687	2,545	2,260	2,190	2,129
	Total CREW-DAYS	199,593	192,423	172,410	161,178	165,624

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 2011 vessels with limited access groundfish permits used 165,624 crew days with close to half coming from vessels with home ports in Massachusetts. Since 2007 the total number of crew days

used by limited access groundfish vessels has declined by 17% (199,593 to 165,624 crew days). Declines in crew days occurred across all home port states, but since 2010 some states have experienced some small increases in the number of crew days (Table 38). Vessels with a home port in New Hampshire experienced the largest percentage decline in crew days (28%: 6,443 to 4,663 crew days), while vessels home ported in states other than CT, MA, ME, NH, NJ, NY, and RI had the lowest percentage decline (3%: 12,158 to 11,767 crew days). All other home port states had crew position reductions ranging from 10% to 17% between 2007 and 2011 (Table 38).

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

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).

The scope of consolidation and redirection of effort that may be expected to result from sector operations in FY 2013 is difficult to predict. Data is now available for the first two years of expanded sector operations, FY 2010 and FY 2011, which is discussed above. In addition, the activities of FY 2012 sectors and individual sector's predictions for expected consolidation in FY 2013 are discussed further in Section 1.1.3.

4.6.8.4 Overview of the Ports for FY 2013 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 2013. The following table summarizes these ports.

Table 39. Home Ports and Landing Ports for Sector Fishermen in FY 2013

State	Primary Ports[a]	Other Ports[b]
Connecticut:	N/A	New London, Stonington
Massachusetts	Boston Chatham Gloucester Harwich Marshfield Menemsha New Bedford Newburyport Plymouth Rockport Sandwich Situate	Barnstable Dennis Hyannis Nantucket Provincetown
Maine	Boothbay Harbor Harpswell (Cundy's Harbor) Kennebunkport Port Clyde Portland Southwest Harbor Stonington	Bar Harbor Five Islands Jonesport Phippsburg (Sebasco Harbor) Rockland Saco South Bristol Tenant's Harbor Tremont (Bass Harbor) Winter Harbor
New Hampshire	Portsmouth Rye Seabrook	N/A
New Jersey	N/A	Barnegut Light Cape May Point Pleasant
New York	Montauk	Hampton Bays- Shinnecock Greenport
Rhode Island	Point Judith Newport	N/A
Virginia	N/A	Chincoteague, Greenbackville

Notes:

[a] Listed by one or more sector as a primary port in their FY 2013 operations plans. A primary port refers to those ports used to land the majority of catch from active sector vessels or where the majority of sector vessels are home ported.

[b] Includes those ports listed by one or more sector as a secondary port but not a primary port. The other ports category includes all remaining ports that may be used by sector vessels.

Appendix B of the 2013 FY 2013 Sector Oeprations Plans and Contracts EA contains a description of each of the primary 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 other 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, social and economic conditions as well as changes in management. These conditions impact, not only to 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. Also, because of the changes considered in the current sector operation plans could have an effect on the lobster fishery and its communities an overview of 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 fisheries 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 resource under a NMFS State-Federal Partnership Program. As part of this

partnership program, the Northeast Maine 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. 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 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.

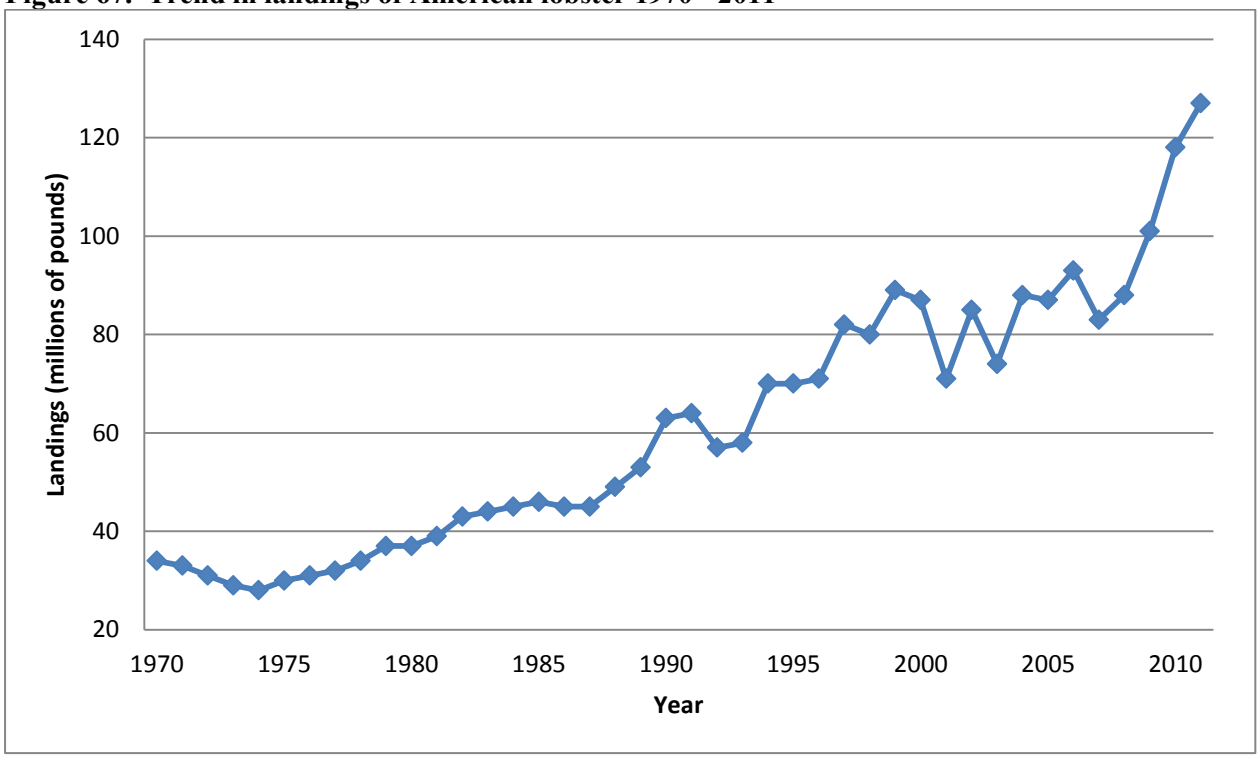
The total number of vessels with any type of lobster permit has stayed relatively constant since the change in management in 1999. The states of Maine and Massachusetts are home to the most vessels with a lobster permit, and combined they account for three quarters of permitted vessels (Table 40). There are some notable differences between the states with regard to the type of permits vessels have. Over the last twelve years, 96% - 99% of vessels with a homeport in Maine have had an area specific trap permit as opposed to only 4% - 8% having the non-trap permit. About half the vessels from other states possess a non-trap permit. For example, in 2011, 483 out of 908 vessels with a home port in Massachusetts have a non-trap permit while two thirds have an area specific trap permit.

Table 40. Numbers of vessels by homeport state, lobster permit type and year

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total	3233	3253	3297	3217	3357	3353	3394	3288	3213	3175	3139	3116
ME												
Any LO permit	1187	1210	1286	1335	1417	1462	1527	1455	1413	1424	1428	1452
Non-trap	61	51	57	66	106	116	117	113	107	104	97	93
Charter	2	1	1	2	2	2	1	1				
Any area trap	1160	1189	1268	1314	1376	1409	1469	1404	1368	1375	1381	1414
NH												
Any LO permit	89	97	93	95	116	117	118	115	117	109	111	111
Non-trap	40	46	46	49	56	56	61	61	59	56	60	53
Charter	2	1	1	2	2	2	2	2	2	2	2	2
Any area trap	66	74	72	71	91	89	83	83	85	85	83	85
MA												
Any LO permit	1215	1185	1169	1114	1106	1055	1022	1016	986	974	944	908
Non-trap	442	449	466	474	500	498	497	521	520	518	500	483
Charter	5	3	7	7	8	7	6	7	8	8	7	6
Any area trap	892	894	885	814	793	742	716	684	656	635	617	589
RI												
Any LO permit	257	265	256	243	243	240	240	234	228	217	213	209
Non-trap	73	83	82	88	84	91	90	91	89	83	78	75
Charter	1	1	1	1	1	1	1	2	2	2	2	2
Any area trap	212	222	220	198	203	198	198	191	183	177	176	172
CT												
Any LO permit	32	37	37	34	33	30	30	30	30	31	28	27
Non-trap	12	16	17	18	22	21	21	21	21	20	20	19
Charter					2	2	2	2	2	2	4	4
Any area trap	25	31	30	25	24	22	21	22	21	22	22	22
NY												
Any LO permit	162	153	147	127	138	134	141	128	124	124	118	120
Non-trap	90	86	83	87	91	83	90	79	81	80	77	78
Charter	4	3	3	5	7	7	6	5	5	5	2	1
Any area trap	94	91	93	66	82	85	86	79	73	74	71	71
NJ												
Any LO permit	166	180	184	152	184	186	193	192	202	190	194	192
Non-trap	78	95	95	117	122	134	138	136	144	136	138	139
Charter	13	10	10	10	13	12	11	11	11	11	11	11
Any area trap	105	115	118	50	86	82	83	84	91	88	89	82

Although the fishery has existed for almost two centuries, consistent and relievable 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 28 million pounds in 1974 to 64 million pounds in 1991 before declining to 57 million pounds in 1992 (Figure 67). 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 127 million pounds in 2011.

Figure 67. Trend in landings of American lobster 1970 - 2011



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 52% and 61% of total lobsters landed from Maine to New Jersey (Table 41). Expansion of lobster landings during the 1980s, particularly in Massachusetts, reduced the share of lobster Maine supplies to less than 50% until the mid 1990s. However, since 2000 the contribution of the Maine lobster fishery to total landings increased steadily to more than 80% of the domestic harvest in 2004 before declining slightly 2005 - 2008. 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 41. Annual share or 5-year average annual share of lobster landings by state, 1970–2011

Year(s)	ME	NH	MA	RI	CT	NY	NJ
1970 - 1974	55.1%	1.9%	19.8%	12.8%	1.9%	3.9%	4.5%
1975 - 1979	58.3%	1.6%	24.0%	9.7%	2.0%	1.9%	2.5%
1980 - 1984	52.5%	2.5%	29.3%	8.4%	3.2%	2.5%	1.7%
1985 - 1989	43.7%	2.5%	32.6%	11.1%	3.8%	3.3%	3.0%
1990 - 1994	49.5%	2.7%	25.7%	11.0%	3.9%	5.1%	2.1%
1995 - 1999	55.9%	1.9%	19.3%	7.6%	3.9%	10.4%	0.9%
2000	65.9%	2.0%	18.2%	8.0%	1.6%	3.3%	1.0%
2001	68.2%	2.8%	17.0%	6.2%	1.9%	2.9%	0.8%
2002	74.7%	2.4%	15.1%	4.5%	1.3%	1.7%	0.3%
2003	74.6%	2.7%	15.5%	4.7%	0.9%	1.3%	0.3%
2004	81.1%	0.2%	12.8%	3.5%	0.7%	1.1%	0.4%
2005	78.3%	2.9%	11.3%	4.9%	0.8%	1.3%	0.4%
2006	78.4%	2.9%	11.9%	4.1%	0.9%	1.3%	0.5%
2007	77.3%	3.7%	12.3%	3.9%	0.7%	1.2%	0.8%
2008	79.3%	2.9%	12.0%	3.2%	0.5%	1.4%	0.7%
2009	80.7%	3.0%	11.7%	2.8%	0.5%	1.0%	0.3%
2010	81.7%	3.1%	10.8%	2.5%	0.3%	1.0%	0.6%
2011	83.0%	3.1%	10.6%	2.2%	0.1%	0.5%	0.6%

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 and 2011 (Table 42). As with landings, Maine has consistently had the highest revenues from lobster of any NE state.

Table 42. Lobster revenue (in thousands of dollars) by state and year 2000-2011

	ME	NH	MA	RI	CT	NJ	NY	Total
2000	$187,715	$7,081	$70,128	$28,103	$5,501	$3,694	$11,555	$314,070
2001	$153,982	$8,072	$53,469	$18,747	$5,453	$2,471	$7,357	$249,840
2002	$210,950	$8,164	$56,582	$15,875	$4,226	$1,139	$5,131	$302,200
2003	$205,715	$8,556	$52,373	$16,731	$3,170	$1,028	$4,426	$292,189
2004	$289,079	$925	$51,643	$14,593	$3,166	$1,800	$3,722	$365,186
2005	$317,948	$14,377	$48,793	$23,010	$3,821	$1,999	$4,396	$414,677
2006	$296,855	$13,915	$52,593	$18,408	$4,031	$2,533	$6,289	$394,918
2007	$280,645	$16,410	$51,268	$17,237	$3,222	$4,055	$5,288	$378,456
2008	$245,186	$12,268	$45,426	$12,994	$2,106	$3,215	$5,498	$326,962
2009	$237,379	$11,919	$42,561	$11,201	$1,914	$1,146	$3,932	$310,293
2010	$318,234	$14,835	$50,261	$12,371	$1,757	$2,910	$4,485	$405,058
2011	$334,974	$16,346	$53,334	$12,728	$816	$3,086	$2,533	$424,087

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. Because of resource depletion and the increasingly stringent regulations found in other fisheries, there has been a contraction of the lobster fishing industry that has increased dependence on lobster fishing (Thunberg, 2007). In the groundfish fishery there maybe contraction as well; lobster landings made by vessels in the groundfish fishery decreased by 1.4 million pounds between the first two years of sector management.

5.0 IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

In order to capture the greatest extent of potential impacts associated with these exemption , the direct and indirect impacts associated with all sector vessels operating under the proposed closed area exemptions are analyzed in Section 5.1.

Section 5.1, establishes criteria for evaluating the impact of each alternative on the VECs identified below and discusses impacts. Cumulative impacts of the proposed action in combination with other past, present, and reasonably foreseeable actions are discussed in Section 5.2.

Potentially Impacted Valued Ecosystem Components (VECs)

This analysis considers impacts to five VECs:

- Physical Environment/Habitat/EFH: 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.
- Allocated Target species: For the purpose of this analysis, the target species VEC includes 14 allocated target groundfish stocks managed under the Northeast Multispecies FMP including (GOM cod, GB cod, GOM haddock, GB haddock, American plaice, witch flounder, GOM winter flounder, GB winter flounder, Cape Cod/GOM yellowtail flounder, GB yellowtail flounder, SNE/MA yellowtail flounder, redfish, pollock, and white hake). 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 21 lists the 14 marine mammal, sea turtle, and fish species that are classified as endangered or threatened under the ESA. The remaining species in Table 21 are protected by the

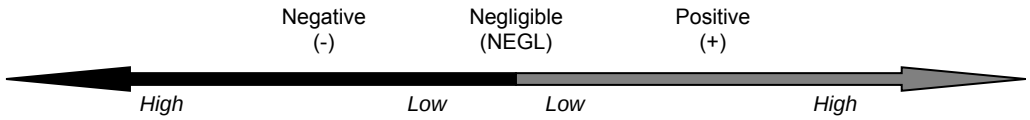
MMPA and are known to interact with the Northeast Multispecies fishery. Section 4.5 describes the current condition of these protected resources.

- 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.

Table 43 defines the impact terms used in this section.

Table 43. Impact Terms

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		
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 DIRECT AND INDIRECT IMPACTS OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVES

The potential impacts of the universal exemptions and general requirements of sector operation (e.g., operations plan) are evaluated in the Amendment 16 Final EIS in accordance with NEPA requirements (NEFMC 2009). A detailed discussion of potential impacts of requested Sector-specific exemptions that went into effect on May 1, 2013 are provided in detail in Sections 5.1.3 through 5.1.5 of the FY 2013 Sector Operations EA. In this EA, the effects of the No-Action Alternative primarily mean a lack of further flexible fishery management for additional sector vessels. The No-Action Alternative serves as the baseline scenario as it represents a continuation of the current condition, including the operation of all sectors under exemptions approved for May 1, 2013. In addition to the No-Action Alternative, the following sections evaluate the potential impacts of the proposed exemptions.

For the purpose of this analysis, the physical environment is defined as the sub-regions comprised of the Gulf of Maine, Georges Bank, the southern New England/Mid-Atlantic areas, and the continental slope. EFH is defined by the SFA as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity".

There are 15 allocated target groundfish stocks (GOM cod, Georges Bank [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, southern New England/Mid-Atlantic [SNE/MA] yellowtail flounder, redfish, pollock, and white hake). These stocks are managed under the Northeast Multispecies FMP.

Non-allocated target species and bycatch are defined in Section 4.4 of the attached EA and may include a broad range of species. For purposes of this assessment, and following the convention established in Amendment 16 EIS, the non-allocated target species and bycatch most likely to be affected by sectors operation include spiny dogfish, skates, and monkfish, typically the top three species caught along with allocated target species. American lobster is also considered a non-allocated target species for this EA as NMFS is considering the approval of an agreement and modification of lobster regulations that would curtail fishing effort for both lobster gear and trawl gear

during certain months of the year. This agreement between the the offshore lobster industry groundfish trawlsectors that has been included in the revised operations plans for the sectors.

As discussed in Section 5.1.4, there are numerous protected species that inhabit the environment within the Northeast Multispecies FMP management unit, and that therefore potentially occur in the operations area of the sectors. These species are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. As listed in Table 21, 19 marine mammal, sea turtle, and fish species are classified as endangered or threatened under the ESA; the remaining species in Table 21 are protected by the MMPA and are known to interact with the Northeast multispecies fishery.

This EA considers the approval of additional exemptions for sectors and evaluates the effect this may have on people's way of life, traditions, and community. These "social impacts" may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. Impacts would be most likely experienced across communities, gear cohorts, and/or vessel size classes. Section 5.1.5 includes a description of the sector participants as well as their homeports.

Summary of Conclusions of Impacts from Alternatives

Table 44 provides a summary of conclusions regarding direct and indirect impacts that would occur as a result of the exemption and operations plan modification. The analysis in this EA shows that impacts of the exemption would vary from low negative to low positive, but would not be significant (see Table 44). Additional discussion on potential impacts to physical environment/habitat/EFH, allocated target species, non-allocated target species and bycatch, protected resources, and human communities is provided in Sections 5.2 and Section 5.3.

Table 44. Summary of Direct and Indirect Effects of the Alternatives

	Valued Ecosystem Components (VECs)					
	Physical Environment	Biological Environment			Human Communities	
ALTERNATIVE	Physical Env./Habitat (incl. EFH)	Allocated Target Species	Non-allocated Target Species and Bycatch	Protected Resources	Ports	Sector Participants
ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA	Negl to L(-)	L(-)	Negl to L(-)	Likely Negl	Likely L(+)	Likely L(+)
ACCESS TO CENTRAL PORTION OF CLOSED AREA II YEAR ROUND CLOSED AREA	Negl to L(-)	L(-)	Negl to L(-)	Likely Negl	Likely L(+)	Likely L(+)
ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA	Negl to L(-)	L(-)	Negl to L(-)	Negl to L(-)	Likely L(+)	Likely L(+)
ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA	Negl to L(-)	L(-)	Negl to L(-)	Negl to L(-)	Likely L(+)	Likely L(+)
NO ACTION	L(+)	Likely Negl	Likely Negl	Negl	L(-)	L(-)

5.1.1 Impacts on Physical Environment/Habitat/EFH

Because the seafloor in any proposed exemption area that has not been subjected to any use of mobile, bottom-tending gear (bottom trawls, scallop dredges, and clam dredges) since the Georges Bank groundfish closed areas were established in December 2004, any amount of bottom trawling in these areas would represent a new source of bottom disturbance with greater potential impacts on essential fish habitat (EFH) than would result from the opening of areas that have not been disturbed by fishing in the last 18 years. Conversely, any reductions in trawling activity in open areas that are currently subjected to bottom trawling would not significantly reduce impacts to benthic habitats outside of the proposed exemption areas. For this reason, the emphasis of this analysis is on the vulnerability of benthic habitats in the proposed exemption areas to new fishing activity that is expected to result from this management action. If a location is highly vulnerable to certain types of fishing activity, there may be habitat impact concerns even if the magnitude of fishing in an area is relatively small. For this reason, it is important to evaluate the habitat vulnerability of each of the exemption areas.

The potential habitat impact of any new fishing activity in the exemption areas will depend on how much of the seafloor is contacted by the gear (per haul or tow), the amount of time the gear is in contact with the bottom, the effective width of the gear, and the frequency of use (number of tows or hauls per unit time). Because bottom trawls have a much greater adverse impact on benthic habitats

than fixed gear (see below), this analysis focuses on the potential impacts of bottom trawls, taking into account the nature of the physical environment (see Section 4.2) and the comparative effects of natural disturbance (wave and current action) and fishing on EFH.

The proposed alternatives would allow selective bottom trawl gear that is designed to target haddock and reduce the bycatch of cod and other groundfish to be used in the CA I exemption area from June 1, 2013, until December 31, 2013 and in the CA II exemption area November 1 to December 31, 2013.[5] Hook gear (e.g., bottom longlines) could also be used in these two areas during the same time periods, but not gillnets. The western and eastern portions of the NLCA would be open to vessels fishing selectrive trawl gear, hook gear, or extra large mesh gillnets (10 inches or greater) for the entire 2013 fishing year (May 1, 2013 – April 30, 2014), 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. The proposed exemption areas are shown in Figure 58 and Figure 62.

5.1.1.1 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 45and Table 46 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%

[5] Selective trawl gear that could be used are the haddock separator and the Ruhle trawl. A review of the available information on the design of these trawls indicates that they contact the bottom in the same way a "standard" fish trawl does, so it is assumed that they would disturb bottom habitats to the same degree.

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 4.2.5).

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 Sections 4.2.1 and 4.2.2)), 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 45. 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 46. 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

5.1.1.2 Current Fishing Activities in the Proposed Exemption Areas

None of the proposed exemption areas have been open to the use of any fishing gear capable of catching groundfish (trawls, hook and line, and gillnets) since the groundfish closed areas went into effect in 1994. Portions of two of these areas – CA I and the eastern portion of the NLCA – are designated as rotational access areas for the limited access scallop fishery. These two areas have been opened periodically during the last 12 years to scallop dredging (Table 47). The original Nantucket Lightship access area was smaller than the area that went into effect in 2011 (see Figure 68). Based on the information in Table 47, CA I was open periodically to scallop dredging for 33.5 months between 2000 and January 31, 2013 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. CA I is closed for the balance of 2013 (after January 31). Thus, any additional disturbance of bottom habitats caused by sector vessels

in the 2013 fishing year in these two areas would be in addition to the disturbance caused by scallop dredges over the past 12 years. It also would occur in areas of high natural disturbance resulting from the action of strong bottom currents and wave action (see Section 4.2.2 and below).

Table 47. Scallop access into CA I and Eastern NLS exemption areas since 2000

Area	Allowable Effort[1]	Season
CA I	2 trips @ 10,000 lb	10/1/00-12/31/00
	1 trip @ 18,000 lb	6/15/05-1/31/06
	1 trip @ 18,000 lb	6/15/07-1/31/08
	1.5 trips[2] @ 18,000 lb	6/15/11-1/31/12
	0.5 trips[2] @ 18,000 lb	6/1/12-1/31/13
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. Any amount of trawling by sector vessels in the western NLS area in 2013 would, therefore, constitute a new source of bottom disturbance by fishing gear. 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.[6] However, the eastern portion of the NLCA is an active scallop access area, and has been disturbed accordingly by scallop dredging.

The proposed CA II exemption area (Figure 70) is closed to the use of scallop dredges and groundfish gear. Opening this area to sector vessels in 2013 would expose benthic habitats to disturbance by

[6] Clam dredging is not currently allowed in the proposed CA I or CA II exemption areas because they are in the portion of Georges Bank that has been closed to clam harvesting since 1990 because of the presence of the toxin that causes paralytic shellfish poisoning. Harvesting of surfclams for testing of an at-sea PSP testing protocol has been allowed in recent years, but it has all taken place outside the groundfish closed areas.

commercial groundfish trawls for the first time since 1994.[7] However, access for sector vessels during the 2013 fishing year would be restricted to two months in the winter (November 1 – December 31). At the other times of year the area would be open to the use of lobster traps which have negligible bottom contact. Given the delay in implementing this action and the fact that eastern Georges Bank is a long way from shore and subject to winter storms, the proposed action is not expected to generate a significant amount of new bottom trawling effort.

5.1.1.3 Habitat Vulnerability To Fishing By Area

The habitats of the four 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 that three of the proposed exemption areas (CA I, CA II, and the eastern NLCA) are located in a wide depth range (20-90 meters), are dominated by sand, granule-pebble, and cobble substrates with some boulders, but no mud. Bottom sediments in the shallower areas where sand predominates are unstable in the prevailing tidal currents whereas the coarser sediments in deeper water are not affected by tidal currents.[8] 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.

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[7] Bottom habitats throughout the region are, of course, periodically exposed to bottom trawls and dredges used to conduct resource surveys and, occasionally, research projects that require the use of mobile, bottom-tending gear.

[8] The bottom shear stress analysis that was conducted on Georges Bank and is cited in the Affected Environment section of this EA does not account for the effects of non-tidal currents or wave action on bottom sediment stability.

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 69 and Figure 71. 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.

5.1.1.1 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 (see Figure 70) 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 can not 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 fragements. 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 moreso 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 (see Figure 58) 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.

Based on the results of the northern edge studies and the results of the literature review that generated the susceptibility and recovery scores for the SASI model (see Section 5.1.1.1), it is likely that the proposed seasonal openings for sector vessels in the central portion of CA II would have an adverse impact on the stable, hard-bottom habitats in that area. These bottom habitats have not been exposed to the use of mobile, bottom-tending gear since December 1994, so it should be assumed that some amount of habitat recovery on the gravel substrates in the northwestern portion of the area has occurred. It may not, however, have been as pronounced as on the northern edge where the research was conducted since the habitat types in the proposed exemption area are dominated more by granule-pebble rather than the coarser cobble and boulder substrates in the habitat closed area (see Figure 59). Also, there is a large amount of unstable sandy sediment in the proposed CA II exemption area where no adverse impacts of this action are expected (Figure 60). Overall, habitat vulnerability in this area – as estimated by the SASI model – is low (Figure 60, Figure 71) and the area would only be opened to sector trawl vesssels from May 1 – June 15 and in November and December.

Any concerns about the habitat impacts of the proposed action on the more vulnerable gravel habitats in CA I and the eastern NLS area (see Figure 62 and Figure 64) that are raised by the northern edge research are unwarranted because both areas have been periodically subjected to heavy scallop dredging since 1994 (see Section 5.1.1.2). Both areas were open to limited access scallop vessels during the last eight months of the 2012 fishing year and the NLS access area will open again for

seven and a half months in June of 2013. We conclude that any additional bottom contact resulting from trawling on gravel habitats in these two areas in 2013 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 69) confirm this conclusion.

5.1.1.2 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 on Georges Bank and 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 three 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. Research studies on Georges Bank show that benthic communities on cobble and boulder habitats require about ten years to recover from the effects of bottom trawling and dredging, but "hard bottom" habitats in the proposed CA II, CA I and eastern NLS exemption areas are composed primarily of gravel (granule-pebble) rather than cobble and boulder.

6. 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 and on the northern edge of Georges Bank.

7. Benthic habitats in two of these areas – the eastern NLCA and CA I – have been exposed to periodic scallop dredging during the last 12 years, and were open to limited access scallop fishing during the 2012 fishing year; the NLS access area will open 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 during the 2013 fishing year, as proposed by this action. This conclusion is supported by studies evaluating differences in epifaunal density and sediment composition before and after scallop dredging on Georges Bank in 2000, and comparisons of the abundance of microhabitat features inside and outside the deeper portion of CA II, south of the proposed exemption area. Although there could be an adverse impact of this action on the stable gravel and cobble habitats in the proposed CA II exemption area in 2013, the amount of bottom

trawling that is likely to result from the proposed seasonal openings is expected to be small. 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 in CAI, CA II, and Western and Eastern NLS would result in negligible to low negative impacts on physical environment/habitat/EFH.

In the NLCA, the standard level of monitoring converage would have negligible impacts on physical environment/habitat/EFH compared to the 100 percent monitoring coverage alternative because NMFS does not expect fishing behavior or effort to change due to the level of coverage.

Figure 68. 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.

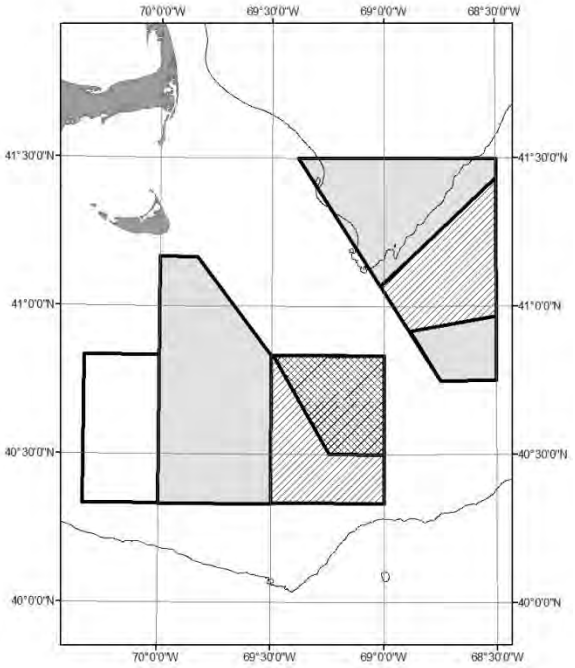


Figure 69. NLS and CA I SASI model simulations showing areas of higher (red) and lower (blue) habitat vulnerability to bottom trawls.

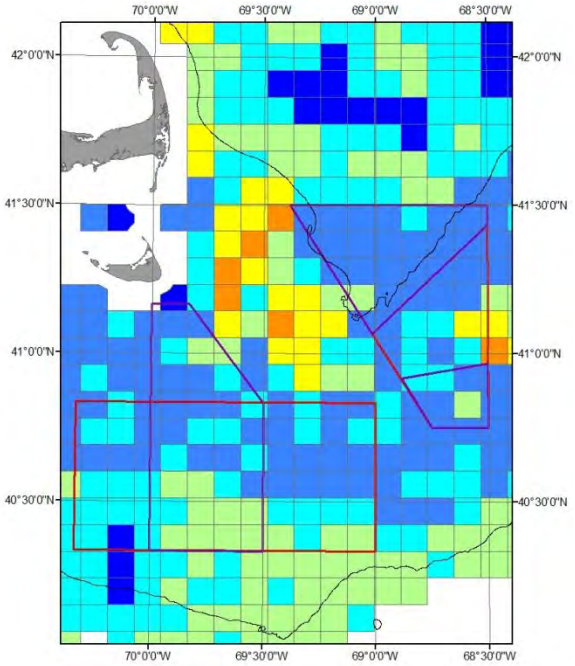


Figure 70. Proposed CA II exemption area showing scallop access areas (diagonal hatching) and habitat closed areas (shaded)

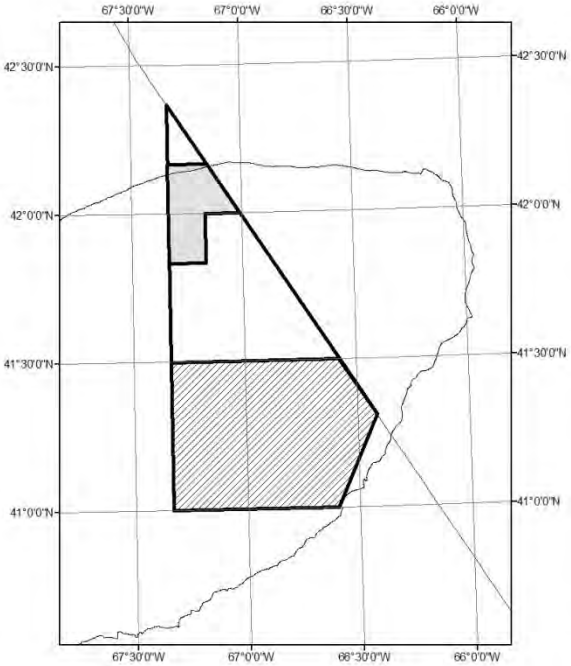
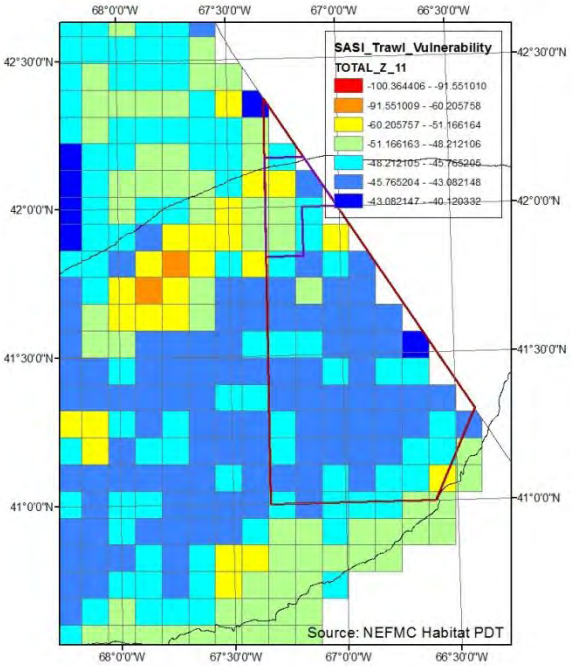


Figure 71. CA II SASI model simulations showing areas of higher (red) and lower (blue) habitat vulnerability to bottom trawls.



5.1.1.3 NO ACTION ALTERNATIVE

Under no action, there would be no access to the existing closed areas by groundfish vessels, unless participating in an approved SAP. Impacts to physical environment/habitat/EFH under no action would generally be low-positive due to the continued restriction on bottom trawling in these areas, specifically within the areas that have not been disturbed by scallop dredging – Western NLCA, and CAII.

5.1.2 Impacts on Allocated Target Species

5.1.2.1 ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA

Georges Bank haddock is currently at very high abundance, and its SSB is above its estimated SSB_{MSY} reference point. Fishing mortality in 2010 was 0.24, below the estimated F_{MSY} of 0.39. Thus Georges Bank haddock is not overfished, nor is overfishing occurring. Haddock occur in high concentrations in the proposed exemption area during winter and spring, but tend to move to deeper waters (such as the northern portion of Closed Area I) during the late summer and fall. The proposed action may have a modest negative effect on Georges Bank haddock if it allows for more of the ACL to be taken. In addition, as detailed in section 4.1, haddock are somewhat larger within the closures; large fish are more fecund, and their offspring may have a higher survival rate. However, the biomass of Georges Bank haddock is expected to increase due to growth of the very large 2010 year class even if the entire ACL is taken (NEFSC 2012b), so that egg production will likely increase regardless if this action is approved. Additionally, strong recruitment has been observed in previous periods of high biomass (prior to the mid-1960s), so that closures are not necessary to induce high recruitment when the biomass is high. Thus, the overall effect of the proposed action on Georges Bank haddock is likely to be low negative.

Georges Bank cod is overfished, and overfishing is occurring (NEFSC 2013). Cod form spawning aggregations in the winter and spring in the proposed exemption area, but generally migrate to deeper waters during the warmer months. Cod often co-occur with haddock, so that targeting haddock may result in considerable bycatch of cod, although the required use of selective gear would mitigate this. Additionally, as detailed in Section 4.1 and in the FW 48 EA, large cod are more common inside closed areas; these individuals are more fecund and their larvae may have a higher survival rate. However, under the proposed action, the area will be closed to fishing when cod are most concentrated in the area. To reduce potential negative impacts to Georges Bank cod, trawl vessels would be restricted to selective trawl gear, such as the Ruhle or Haddock Separator trawl or other selective gear that is currently required to fish within a Special Access Program. Therefore, impacts on Georges Bank cod from the proposed action would be low negative.

A majority of the proposed exemption area is within the Georges Bank yellowtail flounder stock area. Georges Bank yellowtail flounder is overfished, and overfishing is occurring (Legault et al. 2012). The recent assessment Results from the 2013 Transboundary Resources Assessment Committee meeting found that the health of the Georges Bank yellowtail flounder stock is worsening. For example, the combined Canadian and U.S. catches of Georges Bank yellowtail flounder in 2012 were 722 mt. – this is the first time since 1940 that catch has been less than 1,000 mt. Further, recruitment of the three most recent yellowtail flounder cohorts was estimated to be the lowest in the time series. However, yellowtail flounder is of relatively low density in Closed Area I, including the proposed exemption area; much higher densities occur along the southern flank of Georges Bank outside the proposed exemption area. As mentioned above, to reduce potential negative impacts to Georges Bank cod, trawl vessels would be restricted to selective trawl gear, such as the Ruhle or Haddock Separator trawl or other selective gear that is currently required to fish within a Special Access Program. Therefore, the impact of the proposed measures on Georges Bank yellowtail flounder are expected to be low negative.

The far western portion of the proposed exemption area lies within the Cape Cod/Gulf of Maine yellowtail flounder stock area. This stock was also determined to be overfished, and overfishing is occurring, according to the most recent stock assessment (NEFSC 2012b). Since only a small portion of this stock lies within the proposed exemption area, and this area has very low densities of yellowtail

flounder, access to this area is expected to have a low negative to negligible impact to Cape Cod/Gulf of Maine yellowtail flounder.

A majority of the proposed exemption area is within the Georges Bank winter flounder stock area, except the far western portion, which lies in the Southern New England/Mid-Atlantic winter flounder stock area. Georges Bank winter flounder is not overfished, and overfishing is not occurring (NEFSC 2011). Estimated 2010 biomass was at about 82% of the target biomass, and fishing mortality was 0.15, well below the estimated F_{MSY} of 0.42. Southern New England/Mid-Atlantic winter flounder was overfished in 2010, because its SSB was only about 24% of its target biomass (NEFSC 2011). Overfishing was not occurring, however, since its 2010 fishing mortality was about 0.05, only 18% of the estimated F_{MSY} of 0.29. High densities of winter flounder have been observed during the autumn trawl survey in the proposed exemption area; these high densities likely occur throughout the warm water months. In addition, as detailed in section 4.1, these individuals are somewhat larger (hence more fecund) on average than outside the closed areas. Much lower densities are observed during the spring in this area. Summer and fall fishing in this area could produce negative impacts to these stocks unless selective trawl gear that excludes most flounders is required. Since this exemption would require selective trawl gear the impact would be reduced to low negative impacts. Access to this area is unlikely to lead to overfishing of either winter flounder stock, since the fishing mortalities have been well below their thresholds, and because of the limitations of overall TACs.

Gulf of Maine/Georges Bank windowpane flounder are overfished and overfishing is occurring (NEFSC 2012b). Densities of windowpane flounder in the proposed exemption area are low in the winter and spring when windowpane are mostly in deeper water, and are moderate during the summer and fall, when the highest densities on Georges Bank occur in the shoal areas to the east of Closed Area I. Impact of the proposed action on this stock is therefore likely low negative, especially since selective gear which reduces flounder catch is required.

The remaining stocks managed under the New England multispecies management plan will not be impacted substantially by this action, since they do not occur, or occur only in very low numbers, in the proposed exemption area. Further, all allocated species that are harvested by sector vessels are limited by ACL. The ACL limits overall mortality in line with the best available science concerning appropriate catch for each stock.

To sum, NMFS expects low negative impacts to allocated target species as a result of opening up Closed Area I to selective gear. While the catch of some groundfish stocks may increase compared to the No Action, the ACL still limits overall mortality. The seasonal component coupled with the requirement to use selective gear should mitigate the expected harm to allocated target species in this area.

5.1.2.2 ACCESS TO CLOSED AREA II YEAR ROUND CLOSED AREA

High concentrations of haddock occur within the proposed exemption area during the winter and spring, but tend to move to deeper waters during the warmer months. The proposed action may have a low negative effect on Georges Bank haddock if it allows for more of the ACL to be taken. In addition, haddock are somewhat larger within the closures; large fish are more fecund, and their offspring may have a higher survival rate. However, the biomass of Georges Bank haddock is expected to increase due to growth of the very large 2010 year class even if the entire ACL is taken (NEFSC 2012b), so the total egg production of Georges Bank haddock is expected to increase regardless of whether the proposed action is taken. Thus, the impact of the proposed action on haddock would be low negative.

Atlantic cod can form spawning aggregations during the winter and spring in the proposed exemption area, but are at low abundance in this area in the warm water months because they move to deeper waters. Cod often co-occur with haddock, so that targeting haddock may result in considerable bycatch of cod unless selective gear is used. Additionally, as mentioned earlier, cod are somewhat larger on average within the closed areas than outside, so that catch of cod in this area may have a higher impact on the

reproductive output of cod than catch from other areas. To reduce these potential negative impacts to Georges Bank cod, this exemption would restrict trawl vessels to selective trawl gear, such as the Ruhle or Haddock Separator trawl or other selective gear that is currently required to fish within a Special Access Program. Therefore, impacts on Georges Bank cod from the proposed action would be low negative.

The proposed exemption area is part of the Georges Bank yellowtail stock area. Yellowtail flounder are rare in the proposed exemption area that lies between more abundant zones south of 41 30' and on the northern edge of Georges Bank. Thus, the proposed action is expected to have a negligible impact on Georges Bank yellowtail flounder due to the low abundance in the exemption area and due to the required use of selective trawl gear.

Gulf of Maine/Georges Bank windowpane flounder is common in the shallow portions of Georges Bank during the warmer months, including in the proposed exemption area, but tend to move out of this area to deeper waters during the winter and spring. Impact of the proposed action on this stock is likely low negative since selective trawl gear would be required which would reduce flounder catch compared to a standard otter trawl.

Winter flounder, all within the Georges Bank stock area, are common in the proposed area during the winter and spring, and are less common during the warmer months. Impact on the stock from the proposed action is likely to be low negative because only selective gear that excludes most flounders would be permitted. Additionally, a low negative impact would be expected because the area will be closed in the months when winter flounder densities are the highest and only a small portion of the stock is within the proposed exemption area.

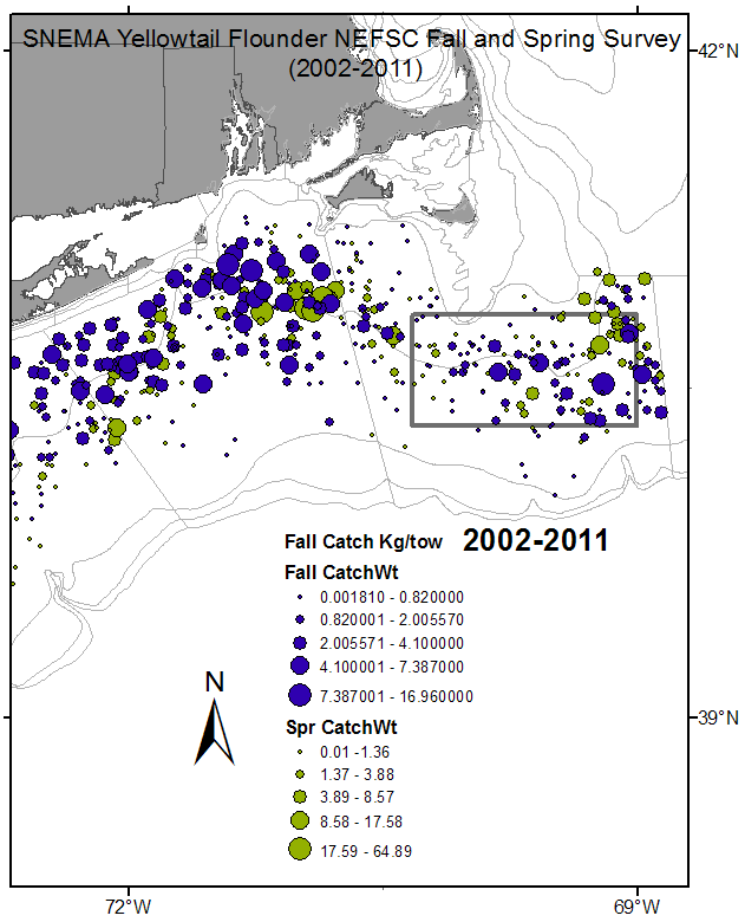
The remaining stocks managed under the FMP will not be impacted substantially by this action, since they do not occur, or occur only in very low densities, in the proposed exemption area.

To sum, NMFS expects low negative impacts to allocated target species as a result of opening up Closed Area II to selective gear. While the catch of some groundfish stocks may increase compared to the No Action, the ACL still limits overall mortality. The seasonal component coupled with the requirement to use selective gear should mitigate the expected harm to allocated target species in this area.

5.1.2.3 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

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. 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 72). 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. Addtionally, the requirement to use extra-large mesh gillnets and selective trawl gear would greatly limit the catch of yellowtail flounder. Therefore, the impact of a fishery in this area on SNE/MA yellowtail flounder is likely low negative.

Figure 72. SNE/MA Yellowtail Flounder Distribution- NEFSC Fall and Spring Survey (2002-20011)



The Nantucket Lightship Closed Area 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 the proposed action 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 Nantucket Lightship Closed Area 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 Nantucket Lightship Closed Area 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 Nantucket Lightship Closed Area. Windowpane flounder are generally not targeted, but can occur as bycatch when trawling for other flounders, monkfish or skates. The proposed action in the western portion of this area will likely have a low negative to 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 Nantucket Lightship Closed Area, 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 to allocated target species as a result of opening up the western portion of the Nantucket Lightship Closed Area. 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.

5.1.2.4 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

The Nantucket Lightship Closed Area 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 (Figure 72). 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 Nantucket Lightship Closed Area 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 Nantucket Lightship Closed Area 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 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 Nantucket Lightship Closed Area 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 Nantucket Lightship Closed Area 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 Nantucket Lightship Closed Area. 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 Nantucket Lightship Closed Area. 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 Nantucket Lightship Closed Area, 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 Nantucket Lightship Closed Area. 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.

5.1.2.5 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact on allocated target species under this alternative is likely to be extremely similar to the impacts as anticipated in these areas with 100% industry-funded at-sea monitoring (Section 5.1.2.3). There are no stocks in this area that are considered overfished or subject to overfishing (this is different than Closed Areas I and II), and sectors have an allocation that restricts their catch of allocated groundfish. Although SNE/MA yellowtail flounder is considered rebuilt, there is some uncertainty in the recent stock assessment. Because of this, selective gear is required for this alternative and will reduce fishing impacts on flatfish. Furthermore, these areas are being opened so sector vessels can better target monkfish, dogfish, and skates. It should also be noted that there are several extra large mesh fishery exemption areas within and surrounding these proposed areas. Trips into these exempted fisheries require similar selective gear requirements and are exempt from at-sea monitoring coverage. When compared to these exempted fisheries, requiring standard at-sea monitoring coverage is an increase in monitoring requirements. However, when compared to the alternative that requires 100% industry-funded at-sea moniotoring for all trips, there is also the chance for increased observer bias or illegal discarding on these trips. For these reasons there would be negligible to low negative impacts on allocated target species.

5.1.2.6 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact on allocated target species under this alternative is likely to be extremely similar to the impacts associated with the western NLCA standard monitoring exemption presented in Section 5.1.2.5. As stated in Section 5.1.25, this exemption would have negligible to low negative impacts on allocated target species.

5.1.2.7 NO ACTION ALTERNATIVE

Under no action, there would be no access to the existing closed areas, unless participating in an approved SAP. Impacts to allocated target species under no action would generally be low-positive if the continued restriction resulted in less harvest of stocks. However, it is difficult to predict whether there would be an increase in effort for certain stocks if vessels are allowed access to the proposed areas. If catch only increased marginally under the proposed action, coupled with the limiting ACLs, there would likely be a negligible impact from no action. To sum, under no action, there may be a low-positive impact when compared to the action alternativs; however, given the action alternatives requirement for selective gear and seasonality restrictions it is more likely that there would be a negligible impact to allocated target species when compared to the action alternatives..

5.1.3 Impacts on Non-Allocated Target Species and Bycatch

5.1.3.1 ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA

Monkfish occur in the proposed exemption area in moderate densities during the warmer months; their densities in this area are low during winter and spring when they move to deeper water. Most of the exemption area lies in the northern monkfish stock area. This stock is not overfished, and overfishing is not occurring. However, there is considerable uncertainty in the assessment of this stock as evidenced by a strong retrospective pattern, likely due to poorly understood growth and natural mortality processes (NEFSC 2010). Impact of the proposed exemption on the northern monkfish stock is likely low negative because selective trawls catch few monkfish, and gillnets would be prohibited.

The skate complex consists of seven managed species. Of these three, little, winter, and clearnose skate, are at high levels of biomass, and are above their biomass target; hence they are not overfished

(NEDPSWG 2009, NEFMC 2012). Additionally, rosette and barndoor skates are above their biomass thresholds, but below their target, so they are also not overfished. However, barndoor skate, which is under a rebuilding plan, is not considered fully rebuilt. Smooth skate biomass has been fairly steady near half its biomass target since 1980; it is considered overfished. Thorny skate biomass has been trending downward since the 1970s, and is currently overfished and at a very low biomass level. Landings of skates, likely primarily winter skates, has been increasing, but discards have been decreasing. Skates lack swim bladders, and are more likely to survive discarding than most fish.

Three of the skate species, little, winter, and barndoor skate, commonly occur in the proposed exemption area. Little and winter skate are distributed throughout the northeast shelf, and do not concentrate in the proposed exemption area. Since they are at high levels of abundance, and the proposed exemption area contains only a small proportion of their total biomass, the impact on these stocks of the proposed action is likely low negative. Barndoor skate are found in the proposed exemption area in relatively high densities during the fall, but move to deeper waters in the winter and spring. Landing of barndoor skate is prohibited. Since only a small portion of the stock is within the proposed exemption area, and since some barndoor skates likely survive discarding, the impact of the proposed action on barndoor skate is likely low negative. Of the other four skate species, thorny and smooth skates are rare in the proposed exemption areas; they are mostly found in deeper waters such as in the Gulf of Maine. Clearnose and rosette skates are primarily found in the Mid-Atlantic, and do not occur in the proposed exemption area. Thus, the impact of the proposed action on these species will be negligible.

Female spiny dogfish biomass was at about 135% its biomass target in 2012, and fishing mortality on spiny dogfish in 2011 was less than half of its F_{MSY}. Thus, spiny dogfish is not overfished, nor is overfishing occurring. However, biomass is expected to decrease between 2012-2020 because of poor pup production during 1997-2003. Spiny dogfish are widespread across the northeast continental shelf, and are highly mobile, and thus do not reside year-round in the exemption area. They occur at low densities in the exemption area during the spring, and in moderate densities 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 CA I. An analyses of vessel trip reports indicates that very little effort takes place in Closed Area I from June through December.during the months proposed for opening. Total landings were less than 1.5%of the total lobster landings from Area 3 permitted vessels during the proposed months for fishing years 2011 and 2012. Further details of this analyses could not be provided due to confidentiality restrictions. Recent settlement data does not show any evidence of larval settlement distribution on Georges Bank (Whale 2010), however the literature does state that the closed circulation of GB provides sufficient rationale for further study to determine if larvae that hatch on the bank will settle there. Although there is a lack of evidence of lobster larval settlement on the bank, the small number of lobster harvested from the area would likely result in negligible impacts to American lobster if this exemption is approved.

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 and do not have high abundance in the proposed exemption area..

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.

5.1.3.2 ACCESS TO CLOSED AREA II YEAR ROUND CLOSED AREA

Monkfish occurs in the proposed exemption area in very low densities during the winter and spring, and somewhat higher, but still low densities during warmer months. Most of the exemption area lies in the southern monkfish stock area; this stock is not overfished, and overfishing is not occurring. However, there is considerable uncertainty in the assessment of this stock (NEFSC 2010). Because of the low densities of monkfish in the proposed exemption area, the impacts of the proposed action on both the southern and northern monkfish stock is likely low negative to negligible.

Three of the skate species, little, winter, and barndoor skate, commonly occur in the proposed exemption area. Little skate are distributed throughout the northeast shelf, and do not concentrate in the proposed exemption area. Since that they are at high levels of abundance, and the proposed exemption area contains only a small proportion of their total biomass, the impact on this stock of the proposed action is likely low. Winter skate can form aggregations in this area during the winter and spring; they are present in lower densities during the warmer months. The impact of the proposed action on winter skate is likely low since fishing will be prohibited during most of the winter and spring, and because winter skate is at a high overall biomass level with only a small proportion of biomass in this area. Barndoor skate are found in the proposed exemption area in low densities during the fall, and are nearly absent in the winter and spring. Landing of barndoor skate is prohibited. The impact of the proposed action on barndoor skate is therefore likely negligible. Of the other four skate species, thorny and smooth skates are rare in the proposed exemption areas; they are mostly found in deeper waters such as in the Gulf of Maine. Clearnose and rosette skates are primarily found in the Mid-Atlantic, and are not in the proposed exemption area. Thus, the impact of the proposed action on these species will be negligible.

Spiny dogfish are uncommon in the exemption area, as observed in both the spring and autumn trawl surveys. Thus, the impact of the proposed action to spiny dogfish will be negligible.

American lobster is harvested in small amounts within the proposed CAII exemption area during the months proposed for opening. However, analyses indicate that very little lobster fishery effort takes place in Closed Area II for the months proposed to be opened. Total landings from the proposed area in 2012 comprised of less than 0.5% of the total lobster landings from Area 3 permitted vessels during the months proposed for opening in fishing years 2011 and 2012, so it is unlikely that any trap/pot effort shift out of the area would result in a more than minor increase in the risk of interactions. Further information on this analyses cannot be provided due to confidentiality restrictions. Recent settlement data does not show any evidence of larval settlement distribution on Georges Bank (Whale 2010), however the literature does state that the closed circulation of GB provides sufficient rationale for further study to determine if larvae that hatch on the bank will settle there. Although there is a lack of evidence of lobster larval settlement on the bank, the small number of lobster harvested from the area would likely result in negligible impacts to American lobster if this exemption is approved.

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.

5.1.3.3 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

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 above average densities in the western portion of the Nantucket Lightship Closed Area. 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. 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 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. 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.

5.1.3.4 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

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 Nantucket Lightship Closed Area. 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 Nantucket Lightship Closed Area, but low densities in the eastern and southern portions. Little skates concentrate at high densities in the western portion of the of the Nantucket Lightship closed 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 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.

5.1.3.5 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact on non-allocated target species under this alternative is likely to be extremely similar to the impacts as anticipated in these areas with 100% industry-funded at-sea monitoring (Section 5.1.3.3). 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. As stated in Section 5.1.3.3, NMFS expects low negative to negligible impacts to non-allocated species as a result of approving this exemption.

5.1.3.6 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impacts on non-allocated target species under this alternative is likely to be extremely similar to the impacts associated with the western NLCA standard monitoring exemption presented in Section 5.1.3.5. As stated in Section 5.1.3.5, this exemption would have low negative to negligible impacts on allocated target species.

5.1.3.7 NO ACTION ALTERNATIVE

Under no action, there would be no access to the existing closed areas, unless participating in an approved SAP. Impacts to non allocated target species under no action would generally be low-positive if the continued restriction resulted in less harvest of stocks. However, it is difficult to predict whether there would be an increase in effort for certain stocks if vessels are allowed access to the proposed areas. If catch only increased marginally under the proposed action, coupled with the limiting TAC on most non allocated stocks, there would likely be a negligible impact from no action. Given the historically low lobster harvest from the proposed areas, it is difficult to imagine a substaintial positive impact associated with maintaining the restrictions on these areas. To sum, under no action there may be a low-positive impact, however, given the requirement for selective gear, and seasonality restrictions under the action alternatives, , it is more likely that there would be a negligible impact to non allocated target species when compared to the action alternatives.

5.1.4 Impacts on Protected Resources

Observed bycatch information was recorded between 2007 and 2010 by the Northeast Fisheries Observer Program. Information on right, humpback, and fin whale sightings was derived from the North Atlantic Right Whale Consortium Database, and distribution information for other marine mammals was based upon information presented in recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Reports (SAR).

5.1.4.1 ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA

5.1.4.1.1 Marine Mammals

White-sided dolphins are present in this area from June through December, with lower presence from January through May. Common dolphins are found on Georges Bank from January through May and through mid-summer to the fall. Pilot whales move to Georges Bank in the late spring and remain until the late fall (Waring et al. 2012).

Opening this area to trawl gear creates some concern, especially in light of recorded marine mammal takes in trawl gear in the northern habitat closure area. There is a corridor of observed marine mammal takes (observed throughout all months of the year) extending from within (in SAP area) and above CA I and diagonally to the east up toward the northern tip of CA II. This line coincides with the northern edge of Georges Bank. These takes are largely pilot whales and white-sided dolphins, with fewer recorded takes of common dolphins and gray seals. There is another corridor of takes (observed in nearly all months of the year) extending from the southeastern end of CA I slightly diagonally and to the east to the southwestern corner of CAII but also extending further along the southern edge of CA II. Takes recorded here are mainly common dolphins, pilot whales, and gray seals. Since these takes were recorded close to or within the boundaries of CA I, it is possible that the likelihood of interactions could increase if effort were to shift into CA I. Small cetacean takes in trawls have been recorded within the northern portion of the habitat area, so it could be likely that effort would shift into the newly opened portion. That could have implications for pilot whales, given the possibility that long-finned pilot whales may approach or exceed PBR, once analyses are complete regarding species-specific abundance and bycatch rates for the two pilot whale species along the Atlantic coast. In conclusion, opening CA I to allow fishing with selective gear from June to December will likely lead to increased incidental bycatch of small cetaceans in this area. However, it is unclear if bycatch levels will also remain consistent in the areas of historical takes or if these bycatch levels will be reduced due to shifts in fishing effort.

Currently, bycatch levels of marine mammals in trawl gear are not exceeding acceptable levels established under the MMPA (Waring et al. 2012). Pending opening this area to selective gear, if bycatch levels of one or more marine mammal species exceed acceptable levels, thus triggering management through take reduction planning, or, if fishing effort substantially shifts and/or increases, NMFS would re-

evaluate small cetacean bycatch and associated fishery-related information, including when and where bycatch is occurring and at what levels, and take appropriate action.

Since this exemption would not open the area to gillnet gear, there are no substantial fishing gear-related concerns regarding interactions with large whales, as these species are believed to interact rarely with bottom trawl or hook and line gear.

CA I overlaps with the Great South Channel Critical Habitat Area that has been designated for right whales (the overlapping portion is the northern habitat closed area portion). This area was designated as critical habitat based on the seasonally high abundance of right whales that aggregate in the area in order to feed. Opening CA I between June and December includes the time period that right whales are expected to be present within the Great South Channel Critical Habitat Area, which could present vessel strike risks to these animals as fishing vessels may now traverse the area in order to enter into CA I. While these vessels are smaller and likely travel slower than the vessels regulated to help reduce the risk of vessel strikes to large whales (65 feet in length or greater), the risk is still present.

The risk of large whale entanglement with trawl or hook and line gear is extremely low. However, these animals are known to interact with fixed gear fisheries such as traps/pots and gillnet gear. There has been some concern rasied related to the potential for lobster trap/pot gear effort to shift away from CA I 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 higher abundances of or interaction rates with endangered large whales (e.g., Great South Channel Critical Habitat Area).

However, an analyses of vessel trip reports indicates that very little effort takes place in Closed Area I from June through December.during the months proposed for opening. Total landings were less than 1.5%of the total lobster landings from Area 3 permitted vessels during the proposed months for fishing years 2011 and 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. Further details of this analyses could not be provided due to confidentiality restrictions. Additionally, all lobster trap/pot gear must comply with the ALWTRP regulations year-round.

It is likely that vessels will fish in CA I in an attempt to increase their catch per unit effort. There is minimal incentive to fish in this area if catch per unit effort is less than it is in other areas. Sector catch in CA I is limited by the sector allocation. Because of this, overall effort is not expected to increase as a result of opening CA I. Due to these reasons, and because interactions betweentrawl and hook gear and marine mammals are not exceeding allowable thresholds under the MMPA at this time, the anticipated impacts on marine mammals from this exemption are likely to benegligible.

5.1.4.1.2 Sea Turtles

Hard-shelled sea turtles in the Northeast Region occur as far north as Canada, but are more commonly found south of Cape Cod. The leatherback sea turtle ranges farther north than any other species. As coastal water temperatures warm in the spring, sea turtles begin to migrate up the U.S. Atlantic coast, occurring in Virginia foraging areas as early as April/May and on the most northern foraging grounds in the Gulf of Maine in June. The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by mid-September, but some turtles may remain in Mid-Atlantic and Northeast areas until late fall.

Incidental captures of sea turtles in fishing gear over Georges Bank have been very rare (fewer than 10 takes have occurred in trawl gear over almost 25 years). Fisheries observers have documented captures around CA I in bottom tending gears, including bottom otter trawls and scallop dredge gear (Figure 72). There is a slight risk to turtles from opening the CA I to trawl gear as turtle interactions have been observed in the region in August and September. Due to these reasons, and because there are few

interactions from trawl and hook gear with sea turtles, the anticipated impacts on sea turtles from this exemption would be negligible.

5.1.4.1.3 Atlantic Sturgeon

Based on the available NMFS observer data, observed captures of Atlantic sturgeon are low in CA I and CA II relative to other areas. While Atlantic sturgeon may occur in these areas, distribution and incidental catch information suggests that these areas are not within the preferred depth range of Atlantic sturgeon. There are no known Atlantic sturgeon aggregation areas in or near any part of CA I or CA II. Observed mortality of Atlantic sturgeon captured in trawl gear is very low. We have no records of sturgeon bycatch on commercial hook gear. Some fishing gear (e.g., lobster traps) may be displaced from the mortality closure areas as a result of allowing sector vessels access to seasonally target haddock. Lobster trap effort is not observed by the NEFOP but there is no information to suggest that Atlantic sturgeon is reasonably likely to be captured in pot/trap gear (either the trap itself or entangled in lines). However, there is little lobster effort in these areas, and therefore, displacement is likely a small concern.

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 (see Section 4.5.3.1) concerning Atlantic sturgeon abundance together with the information as discussed above makes it likely that allowing sector vessels to fish in Closed Area I would have a negligible impact with respect to any of the five Atlantic sturgeon DPSs.

5.1.4.3 ACCESS TO CLOSED AREA II YEAR ROUND CLOSED AREA

5.1.4.3.1 Marine Mammals

If this area is not opened to gillnet gear, there are no concerns regarding increased bycatch within the area of harbor porpoises or other species that primarily interact with gillnets, including large whales. There is some concern related to the potential for lobster trap/pot gear effort to shift away from CA II as a result of allowing trawl gear access to this area.

Several species of marine mammals have been documented by fisheries observers as bycatch incidental to bottom trawl fishing around the region surrounding CA II, especially along the northern and southern portions of the closure area, including white-sided dolphin, common dolphin, pilot whale, harbor porpoise, Risso's dolphin, and minke whales (Waring et al. 2012). There are documented marine mammal takes along the northern and southern edges of Georges Bank, and both the northern and southern portions of the existing closure are found on these banks. Takes have been recorded just outside the northern and southern edges of the closure, and there are two documented takes within the closure itself, likely within the yellowtail flounder/haddock SAP as one take was a white-sided dolphin in August and the other was two common dolphins taken in October. As mentioned above, long-finned pilot whales may be nearing or exceeding PBR, but these calculations are being finalized with differentiation between long- and short-finned pilot whales and allocation of takes to each species. Since trawl takes were recorded close to or within the boundaries of CA II, it is possible that an effort shift into CA II could increase the likelihood of interactions.

Presence of these animals has been documented in the area around CA II during the summer, winter, and spring months by dedicated shipboard and/or aerial protected species research surveys. From the Center's dedicated marine mammal abundance surveys and the observer program, we know that these animals are present in and around the region of CA II year round to varying degrees of frequency depending on the species and time of year. As a result, opening up CA II to fishing with selective trawl gear from November – December could lead to increased incidental bycatch of small cetaceans in these areas. However, it is unclear if bycatch levels will also remain consistent in the areas of historical takes or if these bycatch levels will be reduced or increased due to shifts in fishing effort.

Currently, bycatch levels of marine mammals in trawl gear are not exceeding acceptable levels established under the MMPA (Waring et al. 2012). Pending opening this area to selective gear, if bycatch levels to one or more marine mammal species exceed acceptable levels thus triggering management through take reduction planning or if effort substantially shifts and/or increases, NMFS would re-evaluate small cetacean bycatch and associated fishery-related information, including when and where bycatch is occurring and at what levels, and take appropriate action.

Similar to the opening of CA I, risk of large whale entanglement with trawl or hook and line gear is extremely low. However, these animals are known to interact with fixed gear fisheries such as traps/pots and gillnet gear. There has been some concern rasied related to the potential for lobster trap/pot gear effort to shift away from CA II 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 higher abundances of or interaction rates with endangered large whales (e.g., Great South Channel Critical Habitat Area).

However, analyses indicate that very little lobster fishery effort takes place in Closed Area II for the months proposed to be opened. Total landings from the proposed area in 2012 comprised of less than .5% of the total lobster landings from Area 3 permitted vessels during the months proposed for opening in fishing years 2011 and 2012, so it is unlikely that any trap/pot effort shift out of the area would result in a more than minor increase in the risk of interactions. Further information on this analyses cannot be provided due to confidentiality restrictions. Additionally, all lobster trap/pot gear must comply with the ALWTRP regulations year-round.

Based on large whale sightings taken from the North Atlantic Right Whale Consortium Database and data obtained through OBIS-SEAMAP, few large whale sightings have been recorded in this area during December through March. In the spring months, sightings of all three species increase in the vicinity of CA II with highest numbers here appearing to be in May and June. Right whales sightings diminish in the area by August. Humpback and fin whale sightings largely dwindle during the fall. However, it is important to note that these data should be treated as presence-only, and that an absence of sightings does not indicate an absence of animals from the area.

It is likely that vessels will fish in CA II in an attempt to increase their catch per unit effort. There is minimal incentive to fish in this area if catch per unit effort is less than it is in other areas. Sector catch in CA II is limited by the sector ACE. Because of this, overall effort is not expected to increase as a result of opening CA II. Due to these reasons, and because interactions between marine mammals andtrawl and hook gear are not exceeding allowable thresholds under the MMPA at this time, the anticipated impacts on marine mammals from this exemption would likely be negligible. Additionally, this area will be opened to trawl gear for two months only and during a time when fewer animals are likely to be in the area, thus minimizing the risk of gear interactions.

5.1.4.3.2 Sea Turtles

As mentioned with Closed Area I, hard-shelled sea turtles in the Northeast Region occur as far north as Canada, but are more commonly found south of Cape Cod. The leatherback sea turtle ranges farther north than any other species. As coastal water temperatures warm in the spring, sea turtles begin to migrate up the U.S. Atlantic coast, occurring in Virginia foraging areas as early as April/May and on the most northern foraging grounds in the Gulf of Maine in June. The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by mid-September, but some turtles may remain in Mid-Atlantic and Northeast areas until late fall.

Incidental captures of sea turtles in fishing gear over Georges Bank have been very rare (fewer than 10 takes have occurred in trawl gear in this area over almost 25 years). Fisheries observers have documented captures around CA II in bottom tending gears, including bottom otter trawls and scallop dredge gear (Figure 73. Marine Mammal Takes 2007-2010). Because Closed Area II would only be open between November and December, there is minimal risk for interactions with sea turtles while fishing in Closed

Area II as proposed. Due to these reasons, and because there are few interactions from trawl and hook gear with sea turtles, the anticipated impacts on sea turtles from this exemption would be negligible.

5.1.4.3.3 Atlantic sturgeon

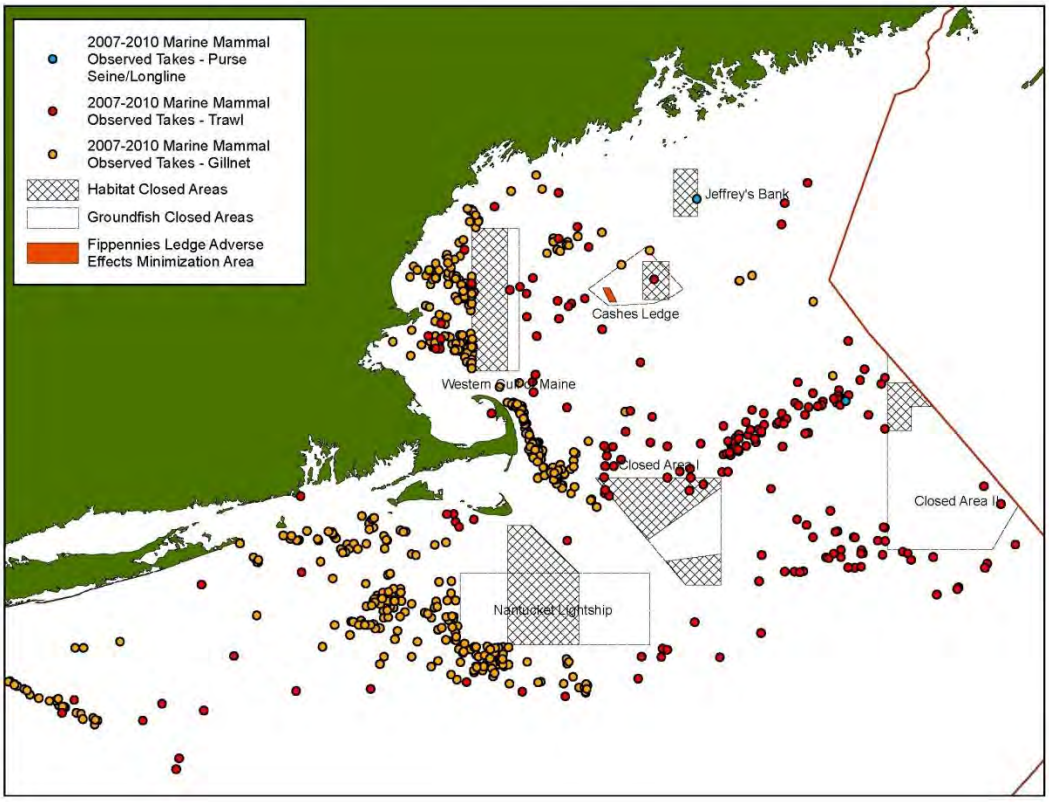
The Atlantic sturgeon impacts if vessels were to be granted access to fish in Closed Area II would be negligible and similar to those described under the impacts discussion for Closed Area I (see section (5.1.4.1.3).

5.1.4.4 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

5.1.4.4.1 Marine Mammals

The greatest concern with granting access to the western portion of the NLCA (west of the habitat closure area) is that there has traditionally been a "wall" of observed marine mammal takes in gillnet gear, particularly harbor porpoises, along the boundary of the closure (Figure 73). The harbor porpoise population has experienced a decline since its last abundance survey, although recent information on annual bycatch estimates in the Northeast sink gillnet and Mid-Atlantic gillnet fisheries indicate annual take levels in these fisheries are below the stock's PBR level. However, take numbers have fluctuated above and below the PBR level over time, and it is not appropriate at present to conclude that takes are steadily declining. Harbor porpoise bycatch information in the vicinity of NLCA indicates harbor porpoises are present mainly from December through May; sightings data (not effort corrected) confirm this and confirm seasonal presence within NLCA. 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). Due to these concerns gillnet gear in the western portion of NLCA will be required to have pingers attached as described in the Harbor Porpoise Take Reduction Plan

Figure 73. Marine Mammal Takes 2007-2010



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 in the spring, mainly consisting of pilot whales, but also including common and white-sided dolphins. This is likely a product of a lack of trawl fishing effort in this particular area.

If large mesh (e.g. monkfish, skates) gillnet effort shifts 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 (Figure 73) into a new one (e.g., against the western border of the habitat closure at 70º00'W).

Opening all or a portion of this area could cause gillnet effort to shift into this area, placing gear in the path of traveling whales. However, it is unknown to what extent effort/gear would shift and how that would impact relative risk to large whales.

With many difficulties surrounding adequate documentation of large whale entanglements in fishing gear (e.g., nature of the interactions, where and how interactions occur and in what specific gear, etc.), if gillnet effort increases in this area, there could be an increase in right and humpback whale entanglement levels in fixed fishing gear. This is of concern because these interactions are already above their PBR levels.

The risk of large whale entanglement with trawl or hook and line gear is extremely low. However, these animals are known to interact with fixed gear fisheries such as traps/pots and gillnet gear. There has been some concern rasied 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 higher abundances of or interaction rates with endangered large whales (e.g., Great South Channel Critical Habitat Area). 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.

Should this area be opened to fishing gear, gillnet gear would be required to be in compliance with the Atlantic Large Whale Take Reduction Plan (ALWTRP) requirements for Other Northeast Gillnet Waters.

It is unclear what type of effort may occur in this area, as much of it would be focused on non-allocated species like dogfish, monkfish and skates. However, 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. Consistent with the analyses of potentially opening other closed areas, 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 interactions with marine mammals. If effort is displaced from other less efficient areas where low catch per unit effort could result in more gear days and thus greater interaction with protected species, to an area where there is greater catch per unit effort, interactions would decrease. However, this is difficult to quanify. It is possible, however, that an increase in effort in this particular area could result in an increase in interactions, particularly with the use of gillnets. The probability of interactions with harbor porpoises and large whales will be reduced because of the pinger requirements under the HPTRP and gillnet gear modification requirements under the ALWTRP, respectively. Because of these reasons, a conservative estimate of the impacts from this exemption would be low negative.

5.1.4.4.2 Sea Turtles

As mentioned in the previous sections, hard-shelled sea turtles in the Northeast Region occur as far north as Canada, but are more commonly found south of Cape Cod. The leatherback sea turtle ranges farther north than any other species. As coastal water temperatures warm in the spring, sea turtles begin to migrate up the U.S. Atlantic coast, occurring in Virginia foraging areas as early as April/May and on the most northern foraging grounds in the Gulf of Maine in June. The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by mid-September, but some turtles may remain in Mid-Atlantic and Northeast areas until late fall.

Bycatch analyses to date have focused on the Southern New England and Mid-Atlantic region, where almost all incidental interactions with sea turtles have been observed. Sea turtles have also been documented in gillnet and trawl gear west of the NLCA. Bycatch rates near 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). 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 have all been in large mesh (11 or 12") gillnets targeting monkfish or skate. The impact to sea turtles of opening NLCA depends on how effort may shift. We have no information to date 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 area to within, we would not expect impacts to sea turtles to increase. However, if substantial effort were to shift from areas or times of lower expected bycatch rates to areas of higher expected bycatch rates (e.g., shifting from Gulf of Maine/Georges Bank to Southern New England), the NMFS would need to evaluate the impacts to determine if one of the re-initiation triggers would be met. 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 Southern New England to the Gulf of Maine/Georges Bank) might reduce impacts to sea turtles. While effort in the multispecies fishery is unlikely to increase, 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. 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.

5.1.4.4.3 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). 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. The likelihood of this happening is unknown. It is entirely possible that effort could shift to areas where less sturgeon are found. It should be noted that there is relatively limited distribution of Atlantic sturgeon in the NLCA. 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, the impacts on Atlantic sturgeon are negligible. It should also be noted that there are a very limited number of observed takes on fishing vessels in or near this area (i.e., within the statistical areas where the NLS occurs) despite higher observer coverage.

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 4.5.3.1 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.

5.1.4.5 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

5.1.4.5.1 Marine Mammals

The impacts of this exemption are expected to be similar to those in the western NLCA (Section 5.1.4.4.1), with the exception of fewer harbor porpoise interactions and large whales. 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. Pingers would not be required while fishing in this area. The eastern portion of NLCA is fairly close to the right whale Great South Channel critical habitat area which is an important area not only for right whales but other large whales and smaller cetaceans. For the reasons provided above, the impacts to marine mammals would be negligible.

5.1.4.5.2 Sea Turtles

The impacts of this exemption would be similar to those in the western NLCA (Section 5.1.4.4.2) because there are no discernible differences in sea turtle distribution or abundance. Therefore, this exemption would have a low negative impact on sea turtles.

5.1.4.5.3 Atlantic sturgeon

The impacts of this exemption would be similar to those in the western NLCA (Section 5.1.4.4.3). because there are no discernible differences in Atlantic sturgeon distribution or abundance. Therefore, this exemption would have negligible impact on Atlantic sturgeon.

5.1.4.6 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact on protected resources under this alternative is likely to be extremely similar to the impacts as anticipated in these areas with 100% industry-funded at-sea monitoring (Section 5.1.4.4). As stated in Section 5.1.4.4., this exemption would have low negative impacts on sea turtles and marine mammals, and negligible impacts on Atlantic sturgeon compared to the No Action. This exemption would have negligible impacts on protected resources compared to the 100 percent monitoring coverage alternative because NMFS does not expect fishing behavior or effort to change due to the level of coverage.

5.1.4.7 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact on protected resources under this alternative is likely to be extremely similar to the impacts as anticipated in these areas with 100% industry-funded at-sea monitoring (Section 5.1.4.5). Therefore this exemption would have low negative impacts on sea turtles and negligible impacts on marine mammals and Atlantic sturgeon compared to the No Action. This exemption would have negligible impacts on protected resources compared to the 100 percent monitoring coverage alternative because NMFS does not expect fishing behavior or effort to change due to the level of coverage.

5.1.4.8 NO ACTION ALTERNATIVE

Under the no action alternative, sector vessels would not be permitted in the proposed closed area exemptions area except when utilizing a special access program (SAP), as currently approved. Because there is not expected to be an increase in fishing activity or location as a result of the no action, there would be no change in current impacts or takes of endangered or protected species. The No Action would potentially result in fewer interactions compared to the action alternatives if overall effort were to increase as a result of implementation of the action alternatives. However, there is little evidence to support an increase in effort resulting from the action alternatives. Further, although there is a potential for lobster gear shift, specifically within the CAII area, the current harvest of lobster in the proposed areas is small, and as such the no action alternative, while potentially providing less risk of increased interactions, would have negligible impacts on protected resources.

5.1.5 Impacts on Human Communites

5.1.5.1 ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA

If approved, these measures would allow sector vessels access to a portion of Closed Area I until December 31, 2013. Trawl vessels would be restricted to selective trawl gear, such as the Ruhle or Haddock Separator trawl or other selective gear that is currently required to fish within a Special Access Program. Hook vessels would be permitted in this area when specified. Gillnet vessels would be prohibited from fishing in Closed Area I.

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 CAI 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 closures[9] and observed tows which ended close to the boundaries of the current closures[10]. There are two distinct proximate areas adjacent to the CAI access area. In these areas, during the timeframe of the opening, observed catch rates are roughly identical for both fixed (longline) and mobile (selective and non-selective) gears primarily targeting lobsters, skates, monkfish and dogfish (Table 48). Mean values are slightly 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 areas 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 will likely be drawn in by improved groundfish catch and not by improved targeting of non-groundfish stocks, as groundfish catch rates are substantially higher than non-groundfish rates for this area. This exemption is unlikely to result in an overall increase in fishing effort for this reason. Improvements in vessel-level profitability will therefore likely come from improved catch efficiency and the ability to better align catch with quota composition.

Additionally, catch rates tend to be higher with selective gear relative to non-selective gear. This is consistent with what would be expected, as selective gears are used in this area by choice to target particular fish stocks under the sector allocation system. Vessels would not ordinarily chose to fish with selective gears unless they felt their overall revenues would be higher. The requirement to use selective gears in this area will likely decrease the amount of fishing in the access area relative to the relaxation of such a restriction, but the restriction itself will not impart additional costs on vessels who chose to fish in the proposed access area unless those vessels do not currently own selective trawl gear. Even in this case, owners would not choose to invest in the new gear unless they believed the return on their investment would be positive. (Table 49)

Based on VTR trip location data, approximately three percent of all fixed gear groundfish catch comes from longline vessels fishing in the statistical areas adjacent to the CAI access area during the timeframe of the proposed opening, with almost no longline fishing reported to be taking place in the areas most proximate to the opening. Approximately 35% of all trawl gear groundfish catch comes from these adjacent statistical areas, with 17% of all trawl catch coming from areas proximate to the opening (Table 50).

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. The relatively small contribution of catch from the proximate areas provides some basis for concluding that effort shifts into this area will likely be small, but the likelihood for differences in catch composition and available revenues well inside the opening and external to it mean that confidence in a low-effort-shift conclusion is low. Additionally, an initial pulse of fishing effort may be seen as operators explore the newly opened area.

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9 Statistical areas 521, 522, 526 and 525 are included as areas adjacent to this proposed opening.

10 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: CAI-West: Point 1 (41.233N, -069.017W); Point 2 (41.233N, -069.183W), Point 3 (40.75N, -068.883W), Point 4 (40.75N, -069.05W). CAI-East: Point 1 (41.6N, -068.5W); Point 2 (41.6N, -068.333W); Point 3 (40.8N, -068.5W); Point 4 (40.7N, -068.333W).

The likelihood of this exemption resulting in a substantial change in the overall spatial distribution of fishing effort is low. The data point towards relatively weak incentives 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 likely be due to groundfish stocks, as this exemption is unlikely to result in additional targeting of non-groundfish stocks. This exemption is most likely to result in small benefits to human communities, derived from better alignment of catch to quota composition or increased efficiency due to improved catch rates.

Non-Sector Vessels

Non-sector vessels may be affected by this proposed action if sector operations displace vessels engaged in non-groundfish fishing. In CAI, this may apply to vessels participating in the offshore lobster, herring, 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 48. Nominal catch and revenue rates for areas adjacent (neighboring stock areas) and proximate (w/in approx. 10nm of boundary) to the CAI access area.

				Catch per hour towed (lbs)			Revenue per hour towed ($)			
Area	Gear	Proximate	Species	Mean	Median	Stdev	Mean ($)	Median ($)	Stdev ($)	n obs tows
CAI	fixed	No	groundfish	279	88	442	512	126	953	721
CAI	fixed	No	lobster, skate, monkfish, dogfish	689	81	1,393	156	36	303	47
CAI	mobile	No	groundfish	70	16	264	102	24	354	39,253
CAI	mobile	No	lobster, skate, monkfish, dogfish	37	11	140	45	22	82	14,636
CAI	mobile	Yes	groundfish	99	12	210	174	20	359	759
CAI	mobile	Yes	lobster, skate, monkfish, dogfish	58	12	165	63	20	138	408

Table 49. Nominal catch and revenue rates for areas adjacent and proximate to the CAI access area for selective and non-selective trawl gears.

				Catch per hour towed (lbs)			Revenue per hour towed ($)			
Area	Gear	Proximate	Species	Mean	Median	Stdev	Mean ($)	Median ($)	Stdev ($)	n obs tows
CAI	non-selective	No	groundfish	67	16	245	95	24	288	36,411
CAI	non-selective	No	lobster, skate, monkfish, dogfish	37	11	134	46	22	81	14,190
CAI	non-selective	Yes	groundfish	75	14	154	135	23	275	556
CAI	non-selective	Yes	lobster, skate, monkfish, dogfish	61	13	170	66	22	142	382
CAI	selective	No	groundfish	121	17	432	194	24	814	2,842
CAI	selective	No	lobster, skate, monkfish, dogfish	41	6	262	36	12	104	446
CAI	selective	Yes	groundfish	166	8	308	282	11	510	203
CAI	selective	Yes	lobster, skate, monkfish, dogfish	18	5	33	13	6	18	26

Table 50. VTR-reported contribution of landings and revenues from statistical areas adjacent to, and areas immediately proximate to, the CAI access area during the timeframe from the proposed opening.

Area	Gear	Proximate	Catch	% lbs caught	% revenue
CAI	fixed	No	groundfish	3.3%	4.2%
CAI	fixed	No	lobster, skate, monkfish, dogfish	3.8%	1.2%
CAI	mobile	No	groundfish	35.3%	36.8%
CAI	mobile	No	lobster, skate, monkfish, dogfish	17.0%	24.3%
CAI	mobile	Yes	groundfish	0.5%	0.5%
CAI	mobile	Yes	lobster, skate, monkfish, dogfish	0.2%	0.2%

5.1.5.2 ACCESS TO CLOSED AREA II YEAR ROUND CLOSED AREA

If approved, the area between 41° 30'N and the Closed Area II Habitat Closure Area of Closed Area II would be open to specific groundfish sector gear types during various portions of fishing year 2013 until December 31, 2013. Approved gears would include the separator trawl, the Ruhle trawl, the mini-Ruhle trawl, rope trawl, and any other gear authorized by the Council in a management action, or approved for use consistent with the process defined in § 648.85(b)(6). Hook vessels would be permitted in this area when specified (see below), however gillnet vessels would be prohibited from fishing in Closed Area II.

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 CAII 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 closures[11] and observed tows which ended close to the boundaries of the current closures[12]. 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 mobile (selective and non-selective) gears, though longline effort in this area is low (Table 51). 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 may be drawn in by improved groundfish catch or

[11] Statistical areas 522 and 525 are included as areas adjacent to this proposed opening.

12 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 (42N, -067.333W); Point 2 (42N, -067.5W); Point 3 (41.333N, -067.333W); Point 4 (41.333N, -067.5W).

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by improved targeting of non-groundfish stocks, as groundfish catch rates are slightly lower than non-groundfish rates for this area. This exemption may result in an overall increase in fishing effort for this reason, though the magnitude of this increase is difficult to estimate. Improvements in vessel-level profitability may result from improved catch efficiency, the ability to better align catch with quota composition, or additional fishing opportunities not previously available.

Catch rates appear to be similar between selective and non-selective trawl gears. Selective gears are used in this area by choice to target particular fish stocks under the sector allocation system. Vessels would not ordinarily elect to fish with selective gears unless they felt their overall revenues would be higher. The requirement to use selective gears in this area may reduce the amount of fishing in the access area relative to the relaxation of such a restriction, but based on catch rates the effect would likely be small. The restriction itself will not impart additional costs on vessels who chose to fish in the proposed access area unless those vessels do not currently own selective trawl gear. Even in this case, owners would not choose to invest in the new gear unless they believed the return on their investment would be positive. (Table 52)

Based on VTR trip location data, well less than one percent of all fixed gear groundfish catch comes from longline vessels fishing in the statistical areas adjacent to the CAII access area during the timeframe of the proposed opening, with almost no longline fishing reported to be taking place in the areas most proximate to the opening. Approximately four percent of all trawl gear groundfish catch comes from these adjacent statistical areas, but less than one percent of all trawl catch comes from areas proximate to the opening (Table 53).

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. The relatively small contribution of catch from the proximate areas provides some basis for concluding that effort shifts into this area will likely be small, but the likelihood for differences in catch composition and available revenues well inside the opening and external to it mean that confidence in a low-effort-shift conclusion is low. An initial pulse of fishing effort may be seen as operators explore the newly opened area. Unlike the CAI proposed access area, this area appears to have relatively high catch rates for non-groundfish stocks relative to groundfish stocks. 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.

The likelihood of this exemption resulting in a substantial change in the overall spatial distribution of fishing effort is low. The proximate area catch rate data point towards weak incentives 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 may be drawn in by some combination of access to profitable non-groundfish stocks, increased catch rates on groundfish stocks or better alignment of catch to available quota. This exemption is most likely to result in non-significant postive impacts to human communities, 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 or lobster regulatory changes displace vessels engaged in non-groundfish fishing. In CAII, this may apply to vessels participating in the offshore lobster 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 the scallop fishery are unlikely. Concerns have been raised about gear conflicts with fixed lobster gear in this area. A non-regulatory agreement between sector vessels and vessels participating in the offshore lobster fishery in this area was reached, resulting in sector vessels not

fishing in portions of this access area except in the months of November and December. In accordance with this agreement, this action proposes to modifiy the lobster regulations at section 697.7to prohibit lobster vessels from accessing this area during the periods listed in Section 3.2 during FY 2013. VTR data indicates that lobster activity during this timeframe is low and gear conflicts are likely to be minimized (see Section 5.1.3.2).

Table 51. Nominal catch and revenue rates for areas adjacent (neighboring stock areas) and proximate (within approximately10 nautical miles of boundary) to the CAII access area.

				Catch per hour towed (lbs)			Revenue per hour towed ($)			
Area	Gear	Proximate	Species	Mean	Median	Stdev	Mean ($)	Median ($)	Stdev ($)	n obs tows
CAII	fixed	No	groundfish	519	117	727	702	128	1,038	50
CAII	fixed	No	lobster, skate, monkfish, dogfish	20	9	28	66	33	84	6
CAII	mobile	No	groundfish	147	37	566	243	62	896	5,549
CAII	mobile	No	lobster, skate, monkfish, dogfish	164	26	905	142	54	475	2,293
CAII	mobile	Yes	groundfish	79	16	212	124	18	323	29
CAII	mobile	Yes	lobster, skate, monkfish, dogfish	32	13	102	46	21	71	74

Table 52. Nominal catch and revenue rates for areas adjacent and proximate to the CAII access area for selective and non-selective trawl gears.

				Catch per hour towed (lbs)			Revenue per hour towed ($)			
Area	Gear	Proximate	Species	Mean	Median	Stdev	Mean ($)	Median ($)	Stdev ($)	n obs tows
CAII	non-selective	No	groundfish	126	37	474	208	64	668	4,893
CAII	non-selective	No	lobster, skate, monkfish, dogfish	163	28	915	143	55	482	2,175
CAII	non-selective	Yes	groundfish	98	14	247	150	17	379	21
CAII	non-selective	Yes	lobster, skate, monkfish, dogfish	33	13	103	46	23	72	73
CAII	selective	No	groundfish	303	34	1,004	505	57	1,843	656
CAII	selective	No	lobster, skate, monkfish, dogfish	181	14	702	121	37	335	118
CAII	selective	Yes	groundfish	29	28	21	53	55	35	8
CAII	selective	Yes	lobster, skate, monkfish, dogfish	1	1	.	5	5	.	1

Table 53. VTR-reported contribution of landings and revenues from statistical areas adjacent to, and areas immediately proximate to, the CAII access area during the timeframe from the proposed opening.

Area	Gear	Proximate	Catch	% lbs caught	% revenue
CAI	fixed	No	groundfish	3.3%	4.2%
CAI	fixed	No	lobster, skate, monkfish, dogfish	3.8%	1.2%
CAI	mobile	No	groundfish	35.3%	36.8%
CAI	mobile	No	lobster, skate, monkfish, dogfish	17.0%	24.3%
CAI	mobile	Yes	groundfish	0.5%	0.5%
CAI	mobile	Yes	lobster, skate, monkfish, dogfish	0.2%	0.2%

5.1.5.3 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

If approved, this measure would allow sector vessels to access Western portions of the Nantucket Lightship Closed area until April 30, 2014. 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[13] and observed tows which ended close to the boundaries of the current closure[14]. 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 (Table 54). 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 55).

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

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13 Statistical area 537 is included as areas adjacent to this proposed opening.

14 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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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 a 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 quoahog 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 54. 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 55. 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%

5.1.5.4 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA

If approved, this measure would allow sector vessels to access Eastern portions of the Nantucket Lightship Closed area until April 30, 2014. 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[15] and observed tows which ended close to the boundaries of the current closure[16]. 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 56). 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

15 Statistical area 526 is included as areas adjacent to this proposed opening.

16 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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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 57)

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. 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 quoahog 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 56. 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 57. 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%

5.1.5.5 ACCESS TO WESTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact to human communities under this alternative is likely to be similar to the impacts as anticipated in these areas with 100% industry-funded at-sea monitoring (Section 5.1.5.3). Compared to the No Action, 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. However, compared the 100 percent monitoring alternative, the benefits under this option would be greater due to the fact that industry would not have to pay for the at-sea monitoring. This would increase the profitability of these trips.

5.1.5.6 ACCESS TO EASTERN PORTION OF NANTUCKET LIGHTSHIP CLOSED AREA WITH STANDARD AT-SEA MONITORING COVERAGE

The impact on human communities under this alternative is likely to be extremely similar to the impacts associated with the western NLCA standard monitoring exemption presented in Section 5.1.5.5. Therefore this exemption would have small benefits to human communities from additional fishing opportunities compared to the No Action and more profitable trips compared to the 100 percent monitoring alternative.

5.1.5.7 NO ACTION ALTERNATIVE

Under the no action alternative, sector vessels would not be afforded access into the exemption areas. The above analysis for the proposed openings contemplates a minor benefit to human communities as a result of additional flexibilities and revenue increases. However, the extent of these benefits can not be quantified. Under no action, vessels would not be provided with an opportunity to benefit from the increase in the operational flexibility and potential revenue from increased landings. Therefore, the No Action Alternative would result in low negative economic and social impacts to both ports and sector participants.

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).

This CEA assesses the combined impact of the direct and indirect effects of additional FY 2013 exemptions analyzed for all 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 2013 operations plans addendums and associated exemptions for all sectors (Proposed Action) with the impacts of fishing under sectors as constituted on May 1, 2013 (No Action Alternative) as currently regulated by the Northeast Multispecies FMP and subsequent actions.

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, 2014, the end of FY 2013. 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, 2014. This is the end of FY 2013 and the period of approval for this action. This EA considers the approval of sector operations plan addendums for the FY 2013. Therefore, the cumulative effects will need to be reassessed as part of the NEPA action taken for FY 2014.

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 44 summarizes the direct and indirect effects on the VECs from the addtional FY 2013 sector exemptions compared to what the impacts would be if vessels continued fishing under their May 1, 2013 operations plans.

The impacts of the proposed action on physical environment/habitat/EFH would range from negligible to low negative. This is based on the physical environmental factors affecting benthic habitat stability and the history of commercial fishing activity in the proposed exemption areas. 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 during the 2013 fishing year, as proposed by this action. Although there could be an adverse impact of this action on the stable gravel and cobble habitats in the proposed CA II exemption area in 2013, the amount of bottom trawling that is likely to result from the proposed seasonal openings is expected to be small. There has been no significant amount of bottom trawling or dredging in the western NLCA 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.

The impacts of the proposed action on allocated target species were also found to be low negative. While the catch of some groundfish stocks may increase compared to the No Action, the ACL still limits overall mortality. Where applicable, the seasonal components coupled with requirements to use selective gear should mitigate the expected harm to allocated target species these areas.

As detailed in Section 5.1.3 the impacts of the proposed action on non-allocated target species and bycatch would range from negligible to low negative impacts. 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 impacts of the proposed action on protected resources in CA I and CA II would likely be negligible. The impacts of the additional exemptions on protected resources in weatern and eastern NLCA would would range from low negative to negligible. Section 5.1.4 details the impacts on marine mammals, sea turtles, and Atlantic sturgeon.

The proposed action would likely have a low positive impact on human communities (ports and sector participants) from additional fishing opportunities.

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 in the EIS for Amendment 16 to the NE multispecies FMP in addition to the FY 2013 Sector EA. The information on relevant past, present and reasonably foreseeable future actions and their impacts are summarized in this section.

Aggregate Sector Impacts

Data from FY 2010 and FY 2011 is presented in Section 4.1 and Section 5.1 of the FY 2013 Sector EA. General trends in catch, trips, and geardays for sector vessels fishing with groundfish gear are down. These downward trends are likely correlated with a reduction in the ACL in FY 2010 and FY 2011 over FY 2009. Further reduction in ACL occurred in FY 2012 and FY 2013

In aggregate, all FY 2013 sector operations plans and exemptions are expected to have negligible impacts on physical environment/habitat/EFH, allocated target species, and non-allocated target species and bycatch. Low negative for protected resources and to low positive human communities would be expected.

Impacts related to general sector operations are considered below and summarized in Table 58.

Other Sector Operation Items

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, because 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.

The ability to transfer ACE within an allotment period results in a net increase of zero, having no impact on achieving target mortality rates, and would have a low positive impact on human communities and negligible impacts on the physical and biological environment.

Based on the sector's minor consolidation predictions, it is anticipated that there would be negligible impacts to all VECs associated with permit consolidation. Consequently, 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.

Because the majority of the allowed catch for the fishery would belong to 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 because 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; low negative for protected resources; and low positive impacts to the human communities.

Table 58. Summary of Aggregated Sector Impacts

Sector	Physical Environment	Biological Environment			Human Communities	
	Physical Habitat (incl. 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	L-	L+	L+

5.2.3 Other Fishing Effects: Past, Present, and Reasonably Foreseeable Future Groundfish and Related Management Actions

Table 59 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. 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 59. 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 59 (continued)
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						
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 59 (continued)
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						
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 risk of 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 59 (continued) 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						
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 59 (continued) 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 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 59 (continued) 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						
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 -

Table 59 (continued) 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
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 +	ND	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+

Noted: ND= Not determined

5.2.3.1 Physical Environment/Habitat/EFH

Past and Present Actions: Amendments 13 and 16 as well as FWs 42, 44 and 45 to the Northeast Multispecies FMP reduced fishing effort. Reduction in fishing effort results in less gear interaction with bottom habitat, effectively producing positive effects for the physical environment.

NMFs implemented FWs 40A and 40B in 2004 and 2005. These FWs increased the number of cod caught with hook gear since previously non-hook vessels could now join the GB Cod Hook Sector. FW 41 allowed non-sector vessels to participate in the Hook Gear Haddock SAP established under FWs 40A and 40B. These actions had a negligible to low positive effect on habitat because hook gear has minimal impacts to bottom habitat. Further, FW 40B removed net limits for trip gillnet vessels, which may have resulted in gear switching to gillnets. While only slight effort changes occurred as a result of FW 40B, switching from gears with more bottom interaction to gillnets would have resulted in a negligible to low positive impact from the removal of the net limit for trip gillnet vessels.

The ALWTRP requires the use of sinking groundlines, which may have a negligible to low negative impact on habitat due to associated bottom sweep by the groundline. In addition, required use of weak links in gillnets may result in floating "ghost gear," which could snag on and damage bottom habitat.

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. NMFS declared the spiny dogfish stock rebuilt for the purposes of U.S. management in May 2010. Prior to FY 2009, spiny dogfish trip limits and quotas were kept low to allow the species to rebuild. Fishermen typically retained spiny dogfish caught incidentally to other target fisheries. The quota was tripled in FY 2009 to 12 million pounds, and the daily trip limit was increased from 600 to 3,000 pounds. A 20 million pound TAL level and a 3,000 pound trip limit is in place for FY 2011. Most of the landed catch has historically been with bottom gillnets, not bottom trawls. Gillnets have a low impact on vulnerable benthic habitats and no appreciable amount of additional trawling was expected as a result of the quota and trip limit increase. Therefore, this FMP has likely had a negligible effect on physical environment/habitat/EFH.

The Monkfish FMP and its modifications have resulted in a reduction in fishing effort, which has resulted in less habitat-gear interaction. Amendment 5 to the Monkfish FMP did not change the DAS and trip limits. Framework Adjustment 7 to the Monkfish FMP (2011) increased the annual catch target for monkfish and increased the DAS and trip limits for category B and D permitted vessels in the Northern Fishery Management Area. Overall, due to the historic reduction in fishing effort, the Monkfish FMP has had a positive impact on physical resources.

Amendment 3 to the skate FMP seeks to sufficiently reduce discards and landings to rebuild stocks of winter, thorny, and smooth skates, and to prevent other skates from becoming overfished. The reduction in fishing effort should result in fewer habitat and gear interactions, a likely positive impact to the physical environment.

The HPTRP final rule (published February 19, 2010 (50 CFR 229.33)) expanded temporal and seasonal requirements within the HPTRP management areas for gillnet gear. This includes sink gillnet gear which is capable of catching groundfish species. The rule is not likely to modify the way that gillnet gear is used in a manner that would affect EFH and habitat. However, it would at least seasonally reduce fishing effort in closure areas. While gillnets have a small impact on benthic habitats, the HPTRP final rule would reduce geardays in closed areas. Therefore, the HPTRP rule is likely having a low positive effect on the physical environment/habitat/EFH.

Although scallop dredges have been shown to be associated with adverse impacts to some types of bottom habitat (NEFMC 2003b), no measure contained in Amendment 15 to the Scallop FMP is likely to increase adverse impacts to areas designated as EFH. Therefore impacts to physical environment/habitat/EFH are expected to be negligible.

Amendment 17 to the Northeast Multispecies FMP is administrative and is not projected to alter fishing behavior. Therefore, impacts to physical environment/habitat/EFH are expected to be negligible.

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 47resulted in relatively minor adjustments in the context of the fishery as a whole and is expected have negligible impacts on EFH.
Furthermore, the proposed action does not allow for access to the existing habitat closed areas on GB that were implemented in Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP and therefore it continues to minimize the adverse impacts of bottom trawling and dredging on EFH. Overall, there are likely to be only negligible impacts to physical environment/habitat and EFH from the adoption of this framework.

Framework 50 to the multispecies FMP is expected to result in reduced ACLs which would likely have positive impacts on habitat due to decreased fishing activity.

Future Actions: The EFH Omnibus Amendment will provide for a review and update of EFH designations, identify habitat areas of particular concern, as well as provide an update on the status of current knowledge of gear impacts. It will also include new proposals for management measures for minimizing the adverse impact of fishing on EFH that will affect all species managed by the NEFMC, in a coordinated and integrated manner. The net effect of new EFH and habitat areas of particular concern designations and more targeted habitat management measures should be positive for EFH.

Any future rule-making to revise the HPTRP could result in additional restrictions on gillnet fisheries. While, gillnets have a small impact on benthic habitat, any future modifications to the HPTRP that further restricts the use of gillnets would likely have a low positive effect on physical conditions due to the decreased fishing effort.

Summary of Impacts: As indicated in Table 59, 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 incorporates seasonal closures for gillnet gear. 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 create 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 resulted in relatively minor adjustments in the context of the fishery as a whole and is expected have negligible impacts on EFH. 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

Past and Present Actions: Although management measures for groundfish were first enacted for the EEZ in 1977 under the original Multispecies FMP, the dramatic increase in larger vessels, bigger gear, and electronic aids, such as fish finders and navigation equipment, contributed to a greater efficiency and intensity of fishing. This in turn resulted in a precipitous drop in landings during the 1980's to an all-time low in the early 1990's. The following discussion is limited to past actions beginning with the implementation of Amendment 13. However, it should be noted that management actions taken prior to Amendment 13 have generally controlled effort on managed groundfish stocks, decreased impacts to habitat, reduced gear interactions with protected species, and had a negative impact on human communities. However, because actions prior to Amendment 13 did not rebuild overfished stocks to sustainable levels, greater effort reductions were necessary.

Amendments 13 and 16, as well as FWs 42, 44 and 45, implemented restrictions on fishing effort in order to rebuild groundfish stocks. These restrictions had positive effects on groundfish. In contrast, FW 40A and 40B allowed for minor increases in fishing effort on cod and/or haddock resulting in low negative impacts on these species. FW 41 expanded participation in the Hook and Gear Haddock SAP to non-sector vessels. However due to the small overall effort increase under this framework it had a negligible effect on allocated target species.

As discussed in Section 4.3, the results of the GARM III show stocks of ocean pout and Atlantic halibut are being fished at a sustainable level, but the biomass indicates stocks have not yet been rebuilt and are considered to be overfished. The stocks of GB haddock and pollock are rebuilt, and GOM haddock, Acadian redfish, and American plaice are no longer overfished or experiencing overfishing. This indicates Amendment 13 and FW 42 management actions have had positive effects on certain groundfish stocks. GOM cod and southern windowpane flounder are not overfished, but they are experiencing overfishing. All other groundfish stocks are overfished and are still experiencing overfishing. The management measures in Amendment 16 to the Northeast Multispecies FMP seek to address the overfishing.

Changes in the ACLs, TACs, and rebuilding strategies for some groundfish species and the implementation of the GOM Cod Spawning Protection Area a introduced measures that slightly reduced overall fishing effort and protected some spawning areas. Therefore, FW 45 had a low positive impact on the overall allocated target stocks.

Because skates, monkfish, and spiny dogfish are managed by FMPs other than the Northeast Multispecies FMP, the impacts of these management measures on allocated groundfish species are briefly discussed below.

The spiny dogfish FMP has resulted in an increase in stock biomass such that the most recent data indicates that the female spawning stock biomass is likely to be above the most recently calculated MSY biomass (B_{MSY}). This development has resulted in increases in both quota and trip limits for this species set by the FY 2010 and 2011 specifications NMFS and he MAFMC set a 20 million pound total allowable landings level and a 3,000 pound trip limit for the fishing year specifications for the FY 2011. With this increase in quotas and trip limits, it is likely that there will be an increase in the amount of spiny dogfish caught and landed by vessels fishing for groundfish. Dogfish is primarily caught incidentally in the multispecies fishery. Therefore, a rebuilt spiny dogfish stock would have negligible effects on allocated target groundfish species.

Monkfish is commonly caught along with groundfish and is one of the top target species that is not allocated to sectors by an ACE. Monkfish are currently regulated by the Monkfish FMP, which was implemented in 1999. The FMP was designed to stop overfishing and rebuild the stocks through:

- limiting the number of vessels with access to the fishery and allocating DAS to those vessels
- setting trip limits for vessels fishing for monkfish
- implementing minimum fish size limits, gear restrictions, and mandatory time out of the fishery during the spawning season

Amendment 5 to the Monkfish FMP implemented ACLs and AMs, and included both DAS and trip limits associated with the new catch targets based on updated stock information. The Monkfish FMP and subsequent amendments and framework actions have reduced fishing effort over the last decade. This has resulted in positive impacts for allocated target species.

As indicated in Table 87 of the Final EIS for Amendment 16 to the Northeast Multispecies FMP, skates comprised nearly half the landings by weight for FY 2006 and 2007, under the Category B DAS (multispecies) program. Skates are currently managed under an FMP. Amendment 3 to the FMP was implemented in 210 and limited skate possession to 500 lbs on common pool B DAS trips. The purpose of Amendment 3 to the Skate FMP regulations are to reduce discards and landings sufficiently to rebuild stocks of winter, thorny, and smooth skates, and to prevent other skates from becoming overfished. The new management measures in Amendment 3 may result in a reduction in fishing effort to rebuild biomass. Therefore, the likely impacts would be positive for the allocated multispecies stocks, which are simultaneously targeted with skates.

NMFS amended the regulations implementing the HPTRP in 2010 to address harbor porpoise mortalities in commercial gillnet gear (75 FR 7383, February 19, 2010). Under this rule, new seasonal management areas were created, others were expanded, and a consequence closure area strategy were implemented to reduce harbor porpoise interactions with fishing. Further, under the ALWTRP, seasonal closure areas and restrictions for commercial gillnets, including sink gillnets in the northeast, have been implemented. These take reduction plans could result in a restriction of fishing effort in closed areas; which would result in a negligible to positive impacts to groundfish species in the closed areas.

The target stock for Amendment 15 to the Scallop FMP is the Atlantic sea scallop. Yellowtail flounder (all three stocks) is a common bycatch species in the scallop fishery. Due to the rate of yellowtail flounder catch in the scallop fishery, Amendment 16 to the Multispecies FMP established a yellowtail flounder ACL sub-component for the scallop fishery. Under Amendment 15 of the Scallop FMP, AMs for the catch of yellowtail flounder in the scallop fishery were established. Therefore, yellowtail flounder caught in the scallop fishery will be considered a sub-ACL controlled by an AM. Adoption of ACLs and AMs for the scallop fishery and the yellowtail flounder bycatch should provide an incentive for scallop fishermen to reduce their yellowtail bycatch in order to maximize scallop yield. For this reason, Amendment 15 to the Scallop FMP should inherently have low positive impacts on allocated target species.

Amendment 17 to the Northeast Multispecies FMP is administrative and is does not alter fishing behavior. Therefore, impacts to allocated target species are expected to be negligible.

Framework 46 adjusts the maximum allowable catch of haddock in the herring fishery, and does not impact the overall ACL. As such impacts would be negligible to allocated target species.

Framework 47 is designed to achieve the rebuilding objectives for the Northeast Multispecies fishery and would control fishing mortality on Northeast Multispecies stocks in order to prevent (or end) overfishing and rebuild overfished stocks. Therefore, impacts to allocated target species are expected to be positive.

Framework 50 to the multispecies FMP is expected to result in reduced ACLs which would likely have positive impacts on allocated target species due to decreased fishing mortality.

Future Actions: The provisions in the EFH Omnibus Amendment could result in greater habitat protection for areas that are highly vulnerable to the adverse effects of fishing, resulting in a likely positive effect on groundfish.

Any future revisions to the HPTRP and ALWTRP could result in additional restrictions on gillnet fisheries. Future actions would likely result in vessels facing additional restrictions and decreased fishing effort, possibly resulting in positive impacts to groundfish and other species that are taken incidentally in the gillnet fishery.

Summary of Impacts: Amendment 13, FW 42, Amendment 16, FW 44, FW 45, FW 47, FW 48 & FW 50 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, HPTRP) will also 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. Amendment 17, and the ALWTRP would have negligible impacts on allocated resources. Framework 46 adjusts the maximum allowable catch of haddock in the herring fishery, and does not impact the overall ACL. 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

Past and Present Actions: Non-allocated target species and bycatch are those species that dominate bycatch (i.e., dogfish) or are the primary alternate species that are landed by groundfishermen (i.e., monkfish and skates). Northeast Multispecies FMP management actions that reduce fishing effort (i.e., Amendment 13, FW 42, 44, and 45, and Amendment 16) have or will likely have indirect positive effects on non-allocated target species and bycatch caught in conjunction with the allocated target species. Conversely, actions that increase fishing effort (i.e., FW 40A, FW 40B, 41) have negligible or low negative effect on both landed species and bycatch.

Spiny dogfish was one of the top non-groundfish species landed by multispecies vessels under the Category B (regular) DAS program (Table 87 of Amendment 16 Final EIS). This species primarily interacts with gillnet and hook and line gear, and represented over 90 percent of the bycatch reported by the GB Cod Fixed Gear and Hook Sectors in 2006 and 2007. Since the spiny dogfish stock is managed under a FMP separate from the Northeast Multispecies FMP, the impacts of the spiny dogfish FMP are briefly discussed. The spiny dogfish FMP was implemented in 2000 in response to a decline in the female spawning stock biomass, and it initiated stock rebuilding measures. Included among the approved management measures in the FMP was the requirement that the MAFMC and NEFMC jointly develop annual specifications, which include a commercial quota to be allocated on a semi-annual basis, and other restrictions to assure that fishing mortality targets will not be exceeded. 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. The dogfish FMP has resulted in a positive impact to the

dogfish stock, the primary bycatch species of the groundfish fleet Dogfish Amendment considers the revisions to the quota allocation scheme which would likely result in positive impacts for dogfish.

Monkfish is commonly caught along with groundfish and is considered one of the top target species that is not allocated to sectors by an ACE (i.e., non-allocated target species). Monkfish are currently regulated by the Monkfish FMP, which was implemented in 1999. The Monkfish FMP and subsequent amendments (such as Amendment 5) and framework actions have reduced fishing effort over the last decade, which has resulted in positive impacts for groundfish and non-groundfish stocks (including bycatch).

Skates comprised nearly half the landings by weight for FY 2006 and 2007 under the Category B DAS (multispecies) program (see Table 87 of the Final EIS for Amendment 16 to the Northeast Multispecies FMP). Skates are currently managed under a separate FMP NMFS implemented Amendment 3 to the Skate FMP in 2010 to reduce discards and landings sufficiently to rebuild stocks of winter, thorny, and smooth skates, and to prevent other skates from becoming overfished. The new management measures in Amendment 3 may reduce fishing effort to rebuild biomass. Therefore, the impacts would be positive for non-allocated target species.

As with allocated target species, revisions to the HPTRP and the ALWTRP could result in additional restrictions on vessels, possibly resulting in negligible to positive impacts to bycatch through effort reductions.

Amendment 15 to the Scallop FMP implemented specific gear and area restrictions that should reduce bycatch of various non-target species. Effort controls to maintain sustainability in the scallop fishery have reduced effort and increased efficiency of the fleet, which reduces impact on non-allocated target species and bycatch. Overall, if mortality on scallops is higher than expected and ACLs are exceeded, AMs will be implemented to correct the overage. That reduced effort would have beneficial impacts on non-allocated target species. Further, it would be expected that AMs developed for yellowtail flounder would also reduce impact on other non-allocated targeted and bycatch species. While there may be a benefit to non-yellowtail flounder bycatch species due to AMs in Amendment 15 and reduced fleet effort due to increased efficiency, impacts from Amendment 15 to Scallop FMP on non-allocated target species and bycatch would be negligible because specific AMs or sub-ACLs for other non-allocated targeted and bycatch species have not been established under this Amendment,

Amendment 17 to the Northeast Multispecies FMP is administrative and is not projected to alter fishing behavior. Therefore, impacts to non-allocated target and bycatch species are expected to be negligible.

Framework 46 adjusts the maximum allowable catch of haddock in the herring fishery, and does not impact the overall ACL. As such impacts would be negligible to non-allocated target species.

Framework 47 is designed to achieve the rebuilding objectives for the Northeast Multispecies fishery and would control fishing mortality. Therefore, impacts to non-allocated target species are expected to be positive.

Framework 50 to the multispecies FMP is expected to result in reduced ACLs which would likely have positive impacts on non-allocated target species due to decreased fishing effort.

Future Actions: Implementation of the EFH Omnibus Amendment may result in additional habitat protections for which there is an indirect positive effect to bycatch species, as they would also receive protection. Similar to allocated species, any future revisions to the HPTRP and ALWTRP could result in

additional restrictions on gillnet fisheries, possibly resulting in positive impacts to non-allocated target species and bycatch through effort reductions.

Summary of Impacts: As indicated in Table 59, 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. Amendment 17 would have negligible impacts on non-allocated target species and bycatch as it is an administrative action. Framework 46 adjusts the maximum allowable catch of haddock in the herring fishery, and does not impact the overall ACL. As such impacts would be negligible to non-allocated target species. Framework 47 measures 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

Past and Present Actions: Reductions in fishing effort through the implementation of management actions such as Amendment 13, FWs 42, 44, 45, 47, 50, and Amendment 16 have generally had positive effects on protected resources by limiting the amount of fishing gear used in their geographic range during the fishing year, which may result in reductions in the rates of gear interaction with endangered species and other protected resources. FWs 40A, 40B, and 41 allowed minor increases in fishing with fixed gear, which had negligible impacts on protected resources.

In addition to these actions, NMFS has implemented specific regulatory actions to reduce injuries and mortalities from gear interactions. NMFS implemented the ALWTRP in 1999 with subsequent rule modifications, restrictions, and extensions. ALWTRP includes:

- time and area closures for trap/pot fisheries (e.g., lobster and black sea bass) and gillnet fisheries (e.g., anchored gillnet and shark gillnet fisheries)
- gear requirements, including a general prohibition on having line floating at the surface in these fisheries; a prohibition on storing inactive gear at sea; use of weak links; and mandatory use of sinking groundlines year-round in the Northeast
- restrictions on setting shark gillnets off the coasts of Georgia and Florida and drift gillnets in the Mid-Atlantic.
- and non-regulatory aspects such as gear research, public outreach, scientific research, a network to inform mariners when right whales are in an area, and increasing efforts to disentangle whales caught in fishing gear.

The intent of the ALWTRP is to positively affect large whales by reducing injuries and deaths of large whales (North Atlantic right, humpback, and fin) in waters off the U.S. East Coast due to incidental entanglement in fishing gear.

The HPTRP has had a positive impact on harbor porpoises since its implementation in 1998. Additional HPTRP measures implemented in 2010 placed additional management restrictions for gillnetters. The HPTRP includes:

- seasonal time and area closures for gillnet fisheries (e.g., sink gillnet)
- seasonal gear requirements (pingers off New England; gear modifications in the Mid-Atlantic)
- consequence closure area strategy where certain areas will become closed if specified bycatch rate thresholds are exceeded after two consecutive management seasons
- mandatory one-time pinger training and requirement to have a pinger authorization on board the vessel when fishing within a pinger management area

Indirectly, the HPTRP may also lead to positive impacts as interactions with other marine mammals may be reduced due to limitations placed on gillnet fishing effort.

The Skate and Monkfish FMPs have historically resulted in a reduction in fishing effort, which has resulted in less fishery interactions with protected resources. Therefore, theses FMP have had positive impact on protected resources.

Under the dogfish FMP, it is likely that there will be an increase in the amount of spiny dogfish caught and landed by vessels fishing for groundfish. Because vessels capturing spiny dogfish primarily use bottom gillnets, this fishery would be subject to protected resources take minimization measures such as pinger requirements and closed areas in the HPTRP and ALWTRP. Therefore, the dogfish FMP would have a negligible effect on protected resources.

Bycatch is one of the primary factors affecting Atlantic sturgeon cited in NMFS' listing for the five DPSs of Atlantic sturgeon. Previous analyses concluded that to remain stable or grow, populations of Atlantic sturgeon can sustain only very low anthropogenic sources of mortality (Kahnle *et al*. 2007). It is apparent, therefore, that reductions in bycatch mortality will most likely be required in order to recover Atlantic sturgeon. Current estimates for DPS are noted in Section 4.5.2.5. Although NMFS does not have information necessary to determine the sex or spawning condition of Atlantic sturgeon encountered by the groundfish fishery, these encounters may include both males and females and fish that may or may not spawn during that year. Therefore, encounters of Atlantic sturgeon by the groundfish fishery are expected to be a subset of the entire population, as opposed to being comprised exclusively of the smaller annual spawning population.

On February 6, 2012, NMFS issued two final rules (77 *FR 5880-5912;* 77 *FR 5914-5982)* listing five Distinct Population Segments (OPS) of Atlantic sturgeon as threatened or endangered. Four DPSs (New York Bight, Chesapeake Bay, Carolina and South Atlantic) are listed as endangered and one DPS (Gulf of Maine) is listed as threatened. The effective date of the listing is April 6, 2012.

NMFS has reinitiated consultation on the ten fisheries, including the NE Multispecies FMP. NMFS has determined that allowing these fisheries to continue during the reinitiation period will not violate ESA sections 7(a)(2) and 7(d). Preliminary analysis indicates that multiple DPSs of Atlantic sturgeon may be affected by the continued operation of these fisheries. During the reinitiation period, NMFS will also review information on listed whales and sea turtles that has become available since consultations on these FMPs were last completed and will incorporate new information and analysis into the biological opinions as appropriate. The ESA and the Section 7 regulations (50 CFR 402.14) require that formal consultation be concluded within 90 calendar days of initiation, and that a biological opinion be completed within 45 days after the conclusion of formal consultation. NMFS anticipates completing these consultations within that period.

NMFS has determined that the continued operation of the NE Multispecies FMP is not likely to jeopardize the continued existence of any listed species including any of the five Atlantic sturgeon DPS's. The NE multispecies fishery may interact with Atlantic sturgeon. However, the more recent, larger

population estimate derived from NEAMAP data support (Kocik et al. 2013) the conclusion that the level of interactions with the NE multispecies fishery is not likely to have a significant adverse impact on the overall Atlantic sturgeon population, or any of the DPSs. Since the decision to list the Atlantic sturgeon DPSs as endangered and threatened under the ESA, the ESA Section 7 consultation for the NE multispecies fishery has been reinitiated and is ongoing. It is expected that an updated Biological Opinion will be issued during the 2013 NE multispecies fishing year that will contain additional evaluation to describe any impacts of the fisheries on Atlantic sturgeon and other listed species and define any measures needed to mitigate those impacts, if necessary. Additionally, this EA evaluates a temporary action, one that is only in place for FY 2013. Therefore, impacts resulting from the approval of additional FY 2013 sector exemptions is not likely to be significant.

Amendment 15 to the Scallop FMP had measures that would be unlikely to alter scallop fishery impacts on protected resources. Therefore, impacts to protected resources are expected to be negligible.

Amendment 17 to the Northeast Multispecies FMP is administrative and is not projected to alter fishing behavior. Therefore, impacts to protected resources are expected to be negligible.

The impacts of Framework 46 contained measures that would be considered to be negligible to protected species as the catch cap would be part of the groundfish allocation structure, and would only allow for the herring fishery to catch what has already been allocated and analyzed.

Framework 47 resulted in relatively minor adjustments in the context of the fishery as a whole and is expected have negligible impacts on EFH.

Future Actions: As of this date, the impacts of the EFH Omnibus Amendment on protected resources are unknown. Any future modifications to the HPTRP may be implemented if harbor porpoise interaction reduction goals are not met, which would result in a positive impact on protected resources through additional reductions in harbor porpoise interactions. EFH fishing closure areas are not developed yet, and as such, potential impacts to protected resources from shifting effort is currently not known.

Serious injuries and mortalities of Atlantic sturgeon in commercial fishing gear are a likely concern for the long term persistence and recovery of the DPSs, and are a primary reason cited for the proposals to list the DPSs under the ESA. If final listing determinations are issued, the existing Section 7 consultation for the multispecies fishery would be reinitiated consistent with the requirement to reinitiate formal consultation where discretionary Federal agency involvement or control of the action has been retained and a new species is listed that may be affected by the action. During the reinitiation, the effects of the multispecies fishery on the five DPSs would be fully examined. Along with the impacts analysis, the formal consultation process will result in conservation recommendations and, if pertinent, reasonable and prudent measures, which would be actions deemed necessary or appropriate to minimize the impacts of take.

Summary of Impacts: As indicated in Table 59, management actions that reduce fishing effort also reduce gear interaction with protected resources, resulting in positive effects. FWs 40A, 40B, and 41allowed 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

Past and Present Actions: Past and present actions that have had negative short-term and low positive long-term impacts to the port communities and positive impacts to sector members include Amendment 13, FWs 42, and 45, and Amendments 16 and 17 to the Northeast Multispecies FMP. These actions both substantially cut fishing effort in order to rebuild stocks by mandated timeframes, resulting in economic losses in the short-term. Because these actions are designed to rebuild the groundfish stocks and stabilize the fishing industry, these actions are expected to have long-term positive effects on the human communities.

FW 40A implemented the Closed Area I Hook Gear Haddock SAP which allowed increased opportunities for the GB Cod Fixed Gear and Hook Sector to fish healthy haddock stocks using hook gear only, resulting in a low positive effect for members of this sector. FW 41 allowed non-sector vessels to participate in the Closed Area I Hook Gear Haddock SAP, which extended the positive economic effects to non-sector vessels and increased revenue for the port communities, resulting in a low positive effect. FW 40B allowed vessels with no hook history to join the GB Cod Hook Sector and contribute their historical cod landings to the sector's allocation based on landings made with gear types other than hook gear, resulting in a low positive impact to the sector participants.

The ALWTRP had impacts on the human community ranging from low negative to negligible; primarily because these measures required minor gear modifications for gillnet gear to reduce impacts to protected resources. Similarly, actions of the HPTRP could have negative impacts, particularly if the impacts from this plan compound reductions implemented via Amendment 16.

Historically, the spiny dogfish FMP has had a low negative impact on human communities because of the implementation of quotas and trip limits, therefore, reducing revenue. However, the FY 2009 and FY 2010 specifications increased the quota and trip limits because the species is no longer considered overfished nor is overfishing occurring. This increase in quota and the rebuilding goal of the FMP will likely have a positive impact on the human communities because there will be a sustainable fishery available for harvest. Dogfish Amendment 3 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. This would likely have positive impacts on human communities.

The Monkfish FMP has resulted in a reduction in fishing effort while the stock was rebuilding, which resulted in less revenue and a low negative impact on human communities. Over the long term, a sustainable monkfish fishery through management actions would result in long term beneficial impacts. Amendment 5 is currently considering a range of alternatives which would establish ACLs and AMs that would likely control fishing effort at a level that achieves optimum yield while preventing overfishing, which may continue the long-term positive effect.

Amendment 3 to the Skate FMP will likely have negative economic impacts on the ports and sector members because of the expected restrictions on fishing effort. Similarly, the actions of the HPTRP could have negative impacts, particularly if the impacts from this plan compound reductions implemented via Amendment 16.

Amendment 17 to the Northeast Multispecies FMP is an administrative action which would clarify and streamline the procedures and requirements with which NOAA-sponsored, state-operated permit banks must comply in order to lease allocation to a sector and sector vessels. Therefore, due to its administrative nature, Amendment 17 is projected to have negligible impacts on human communities. Amendment 17 would allow for NOAA-sponsored, state-operated permit banks to acquire and lease ACE (and DAS) to existing sectors (and sector vessels), and as such, the impacts associated with this transfer

of ACE are similar to what are assessed in Section 5.1.3 of this document concerning the approval of sectors. As the MOAs between NMFS and the States' prohibit these permit banks from actively fishing acquired ACE, all impacts related to the goals and operation of the NOAA-sponsored, state-run permit banks, such as preserving fishing opportunities for small scale-fishing operations, mitigating the disproportionate impacts on small communities that may result from fleet consolidation, and effects on allocation market prices, are assessed under the approval of sector operations plans within this document. If no sector operations plans are approved, there would be minimal impact from the ability of a NOAA-sponsored, state-operated permit bank to acquire or lease ACE under Amendment 17, as they would have no ability to fish this ACE per the MOA, or to lease ACE to sectors.

Most of the measures in Amendment 15 to the Scallop FMP will not change economic impacts for the scallop fishery, or are expected to have indirect economic benefits. Amendment 15 would result in the establishment of AMs and a yellowtail flounder bycatch ACE. Because this yellowtail flounder bycatch ACE would be accounted for under Amendment 16 to the Multispecies FMP, the establishment of yellowtail flounder AMs are designed to rebuild the yellowtail flounder stocks and stabilize the fishing industry, these actions are expected to have a low positive effect on the human communities that rely on groundfish. Further, the sub-ACL of yellowtail flounder would represent the amount that has been caught in the scallop fishery in the past; therefore, the AMs would apply to the scallop fishery (such as in the case of an overage), and not necessarily be applied against the sector's ACE. This would result in an additional positive impact on human communities, as the sector vessels would not likely be held accountable for an overage from the scallop fleet.

Framework 46 would increase the amount of haddock the herring fishery can catch before reaching its cap; however, it effectively does so by reallocating fish from the groundfish fishery. This can lead to negative *attitudes*, especially by smaller operators in the groundfish fleet who perceive the much larger herring vessels to be unfairly benefitted by these types of measures. Therefore, a negligible to low negative impact to human communities can be expected.

Framework 47 had negative impacts on human communities due primarily to the reduced the ABCs/ACLs for GOM cod and GB yellowtail flounder.

Framework 48 to the multispecies FMP considers measures to reduce costs, add flexibility for groundfish vessels which would likely result in positive impacts to human communities. Framework 50 to the multispecies FMP is expected to result in reduced ACLs which would likely have negative impacts on human communities due to decreased fishing opportunity.

Future Actions: Cumulative effects of the EFH Omnibus Amendment cannot easily be determined. Similar to the 2010 modifications to the HPTRP, potential future modifications could result in additional reductions in fishing effort which would result in a negative impact on human communities.

Summary of Impacts: As indicated in Table 59, 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 60 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 60. 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 2012 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 60).

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 to low negative. 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 low negative impacts to allocated target species, 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 proposed action would have negligible to low negative 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. While the catch of some non-allocated target species may increase slightly over the No Action, these species are 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 proposed action may increase the potential for gear interactions with protected species in the proposed western and eastern Nantucket Light ship exemption areas. Therefore, the proposed action would likely have low negative to negligible 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 FW 44 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 proposed action would likely have a l low positive impact on human communities, including ports and sector participants, due to increased fishing opportunities. 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 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.

5.2.5.6 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 61). These impacts would not be significant due to the reasons stated in this assessment.

Table 61. 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 58)	Negl	Negl	Negl	Negl	L+	L+
	Effects of Past, Present, and Reasonably Foreseeable Future Non-Fishing Actions (see Table 59)	- to L-	L-	L-	L-	Negl to L-	Negl to L-
	Effects of Past, Present, and Reasonably Foreseeable Future Fishing Actions (see Table 60)	+	+	+	+	-	-
Direct and Indirect Effects of Proposed Action (see Table 44)		Negl to L-	L-	Negl to L-	Negl to L-	Likely L+	Likely L+
Cumulative Effects Sum of Effects from implementation of Sector operations and Cumulative Effect Baseline		Negl	Negl	Negl	Likely L-	L+	L+

5 LIST OF PREPARERS AND PERSONS/AGENCIES CONSULTED

The following staff members of the National Marine Fisheries Service (NMFS) Northeast Regional Office and the Northeast Fisheries Science Center collaborated on the preparation of this document:

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6 COMPLIANCE WITH APPLICABLE LAWS AND EXECUTIVE ORDERS

6.1 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 FW 45, 47, and 48, 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, including exemptions asa proposed in this action 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 that an EA of sector operations plans be prepared 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 19 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.

An EFH assessment was conducted. It was determined that the proposed action would only have a minimal (or low negative) impact on EFH for federally-managed species in the NE region. As explained in the document, benthic habitats in two of the areas (eastern Nantucket Lightship and Closed Area I in the Great South Channel) are periodically exposed to scallop dredging and the overall vulnerability of bottom habitats in all four areas is low. More vulnerable hard bottom areas in CA2 on eastern Georges Bank where there has been no bottom trawling or dredging since these areas were closed in 1994 would only be exposed to fishing for two months (Nov-Dec 2013) since the other season (May 1 - June 15) when the area would have opened will have passed by the time this action is implemented. Habitats in the western NLS area are predominantly mud and sand, so any impacts of trawling there would be minimal as well.

Since this action will have no more than minimal adverse effects on EFH, no EFH conservation recommendations to provide for this action pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act are provided.

6.2 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. On February 6, 2012, NMFS published final rules listing the GOM DPS of Atlantic sturgeon as threatened, and listing the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon as endangered, effective April 6, 2012. Preliminary analysis indicates that multiple Atlantic sturgeon DPSs may be affected by the continued operation of the NE multispecies fishery. Formal consultation under Section 7 of the ESA has been reinitiated and is ongoing for the NE multispecies fishery. The previous BO for the NE multispecies fishery completed in October 2010 concluded that the actions considered would not jeopardize the continued existence of any listed species. This BO will be updated and additional evaluation will be included to describe any impacts of the NE multispecies fishery on Atlantic sturgeon DPSs and define any measures needed to mitigate those impacts, if necessary. It is anticipated that any measures, terms and conditions included in an updated BO will further reduce impacts to the species. While it is likely that there will be interactions between Atlantic sturgeon and gear used in the groundfish fisheries, the amount of interactions attributable to this fishery that will occur between now and the time a final BO will be published is not likely to cause an appreciable reduction in survival and recovery of any of the five DPSs. NMFS determined in an August 28, 2012, memorandum that allowing the NE multispecies fishery to continue during the reinitiation period will not violate ESA sections 7(a)(2) and 7(d). This determination may be revised if an updated Biological Opinion is received.

Thus, NMFS has concluded, at this writing, that the proposed action and the prosecution of the multispecies fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical

habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 16 Environmental Impact Statement. NMFS does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when compared to the prosecution of the fishery prior to implementation of Amendment 16. For further information on the potential impacts of the fishery and the proposed management action on listed species, see Sections 4.5.4 and 5.1.4 of this document.

6.3 MARINE MAMMAL PROTECTION ACT (MMPA)

NMFS has reviewed the impacts of this proposed action 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 5.1.4, 5.1.4, 5.1.5 and 5.1.6.

6.4 NATIONAL ENVIRONMENTAL POLICY ACT

6.4.4 Finding of No Significant Impact (FONSI)

5.3 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

NOAA Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a Proposed Action. In addition, the CEQ regulations at 40 C.F.R. 1508.27 states that the significance of an action should be analyzed both in terms of "context" and "intensity." The Proposed Action in this EA is the approval of additional exemptions for each of the 17 fishing year (FY) 2013 Multispecies sector operations plans and complimentary changes to the American Lobster FMP. Each criterion listed below is relevant in making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NOAA Administrative Order criteria and CEQ's context and intensity criteria. These include:

1. *Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?*

Response: The Proposed Action would not jeopardize the sustainability of any of the target species identified in Section 4.3, because each sector has an Allowable Catch Entitlement (ACE) for each stock listed above that is a portion of the ACL established by the Northeast (NE) Multispecies FMP and that would be adhered to on an annual basis. Additionally, the seasonal components of these exemptions coupled with requirements to use selective gear should reduce impacts to allocated target species. The biological impacts of the Proposed Action on the allocated target species are analyzed in Section 5.1.

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

Response: The Proposed Action is not expected to jeopardize the sustainability of any non-allocated target species. The proposed action may increase the harvest of non-target species. However, if increased flexibility from the exemptions improves the harvest of target species similarly to non-allocated target species and bycatch, then the relative catch rate of non-allocated target species and bycatch would be controlled by ACE. Once an ACE has been reached, fishing must cease. 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.

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

Response: The Proposed Action is not expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Act and identified in the FMP. This is based on the physical environmental factors affecting benthic habitat stability and the history of commercial fishing activity in the proposed exemption areas. 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 during the 2013 fishing year, as proposed by this action. Although there could be an adverse impact of this action on the stable gravel and cobble habitats in the proposed CA II exemption area in 2013, the amount of bottom trawling that is likely to result from the proposed seasonal openings is expected to be small. There has been no significant amount of bottom trawling or dredging in the western NLCA 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.

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

Response: The Proposed Action is not expected to have a substantial adverse impact on public health and safety. The sectors would engage in routine fishing operations and would not affect safety at sea. Since sector fishing effort is controlled by species-specific ACE the proposed action may allow fishermen to more fully exploit previously under-exploited stocks, and reduce incentive to fish in unsafe conditions (Section 5.1).

5. *Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*

Response: The Proposed Action is not expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species. Section 5.1details the impacts on marine mammals, sea turtles, and Atlantic sturgeon. Sector members would be limited to hook gear and selective trawl gear in CA I and CA II, while sector vessels would also be allowed to fish 10-inch (25.4-cm) diamond mesh or larger gillnet in NLCA. Gillnet vessels would be required to use pingers when fishing in the NLCA. Impacts to cetaceans and pinnipeds from the use of gillnets would be minimized by use of the Take Reduction Plans, as discussed in Section 5.2.4.3. Trawl gear is generally considered to have low impacts on most protected resources. Hook and line gear is generally considered to have low impacts on most protected resources.

As described in Sections 5.1, 5.2.4.3, and 6.2, NMFS has determined that the continued operation of the NE Multispecies FMP is not likely to jeopardize the continued existence of any listed species including any of the five Atlantic sturgeon DPS's. The NE multispecies fishery may interact with Atlantic sturgeon. However, the more recent, larger population estimate derived from NEAMAP data support (Kocik et al. 2013) the conclusion that the level of interactions with the NE multispecies fishery is not likely to have a significant adverse impact on the overall Atlantic sturgeon population, or any of the DPSs. Since the decision to list the Atlantic sturgeon DPSs as endangered and threatened under the ESA, the ESA Section 7 consultation for the NE multispecies fishery has been reinitiated and is ongoing. It is

expected that an updated Biological Opinion will be issued during the 2013 NE multispecies fishing year that will contain additional evaluation to describe any impacts of the fisheries on Atlantic sturgeon and other listed species and define any measures needed to mitigate those impacts, if necessary. Additionally, this EA evaluates a temporary action, one that is only in place for FY 2013. Therefore, impacts resulting from the approval of additional FY 2013 sector exemptions is not likely to be significant.

Overall, impacts to protected resources associated with the proposed action would likely be low negative, but not significant (Section 5.1).

6. *Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?*

Response: The Proposed Action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. Sectors would still be limited by the amount of groundfish that they each would be allowed to catch and land. Once the ACE has been reached, sector vessels would no longer be able to expend effort on catching groundfish.

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

Response: There are no significant social and economic impacts of the Proposed Action that are interrelated with natural or physical environmental effects. Sectors would still be limited by the amount of groundfish that they each would be allowed to catch and land. The proposed action would mitigate the negative economic impacts that result from the current suite of regulations that apply to the groundfish fishery as well as meet the conservation requirements of the FMP. The proposed action allows flexibility and economic opportunity to the sector members and their communities. However, within the context of the region and the fishery as a whole, these benefits would be insignificant as determined under criteria of the Regulatory Flexibility Act (see Section 6.9). Further, while the sector members benefit socially and economically by the proposed action, this opportunity is not related with any impacts associated with the biological or physical environment. Therefore, the social and economic impacts of the Proposed Action are not interrelated with significant natural or physical environmental effects.

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

Response: The effects of the Proposed Action on the quality of human environment are not expected to be highly controversial. A robust analysis incorporated information and discussion from the CATT and NEFSC. The areas considered were specifically tailored to the harvest of healthy stocks without compromising the biological objectives of the Northeast Multispecies FMP or the goals and objectives set forth by the Council in the Northeast Multispecies FMP. This included ensuring that additional opportunity provided by closed area access would not jeopardize stock rebuilding or EFH closure areas. As described in Section 5.1, the Proposed Action is likely to have low positive impacts on human communities. While the Proposed Action would result in negligible to low negative impacts to physical environment/habitat/EFH, allocated target species or non-allocated target species and bycatch, and protected resources, these impacts, as discussed in Section 5.1, are not expected to be significant.

9. *Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, parkland, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?*

Response: It is possible that historic or cultural resources such as shipwrecks could be present in the area where the groundfish fishery is prosecuted. However, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the proposed action would result in substantial impacts to unique areas.

10. *Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

Response: The effects of the Proposed Action on the human environment are not expected to be highly uncertain or involve unique or unknown risks. While it is difficult to predict effort shifts as a result of the proposed action, overall sector effort would still be limited by their ACE. Additionally, opportunity provided by closed area access is a short term action (1 year) using selective gear that would not jeopardize stock rebuilding or EFH closure areas.

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

Response: The CEA presented in Section 5.2 of this document considers the impacts of the Proposed Action in combination with relevant past, present, and reasonably foreseeable future actions and concludes that no significant cumulative impacts are expected from the implementation of the Proposed Action. Further, the Proposed Action would not have any significant impacts when considered individually or in conjunction with any of the other actions presented in Section 5.2 (fishing related and non-fishing related).

12. *Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?*

Response: Although there are shipwrecks present in areas where fishing occurs, including some registered on the National Register of Historic Places, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the proposed action would adversely affect the historic resources.

13. *Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

Response: No non-indigenous species would be introduced during the Proposed Action because operations in closed areas would be confined to traditional fishing practices, and no non-indigenous species would be used or transported during the sectors' activities. Therefore, the Proposed Action would not be expected to result in the introduction or spread of a non-indigenous species.

14. *Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?*

Response: The NEFMC has authorized the formation of multiple sectors under Amendment 16 and FW 45 to the NE Multispecies FMP and has set forth criteria for establishing sector exemptions in this action. The Proposed Action was initiated in response to these actions as well as the Council's request through FW 48. It does not set a precedent because it abides by the criteria set forth in Amendment 16, FW 45 and FW 48. Each sector exemption proposal is considered individually on its own merits and expected impacts, and includes a specified process for public comment and consideration. Therefore, the Proposed

Action is not likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.

15. *Can the proposed action reasonably be expected to threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment?*

Response: The Proposed Action is not expected to threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment. In addition to the harvest rules of each sector, sectors would comply with all local, regional, and national laws and permitting requirements while fishing in the closed areas.

16. *Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?*

Response: The Proposed Action is not expected to result in cumulative adverse effects that could have a substantial effect on target or non-target species. As stated in Section 5.1, and 5.2, the impact on resources encompassing groundfish and other stocks is expected to be minimal.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting EA prepared for the approval of additional exemptions to each of the 17 fishing year (FY) 2013 Multispecies sector operations plans and complimentary changes to the American Lobster FMP, it is hereby determined that the approval of these fishing regulation exemptions and associated FMP modifications, will not significantly impact the quality of the human environment as described above and in the supporting EA. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

Regional Administrator Northeast Region, NMFS

17 Sept 2013
Date

6.5 ADMINISTRATIVE PROCEDURE ACT (APA)

The Assistant Administration for Fisheries (AA) finds that there is adequate justification under 5 U.S.C. § 553(d)(1) to waive the 30-day delay in effective date because this rule relieves several restrictions. This rule helps the NE multispecies fishery mitigate the adverse economic impacts resulting from continued efforts to end overfishing and rebuild overfished stocks, and increases the economic efficiency of vessel operations. As explained in detail above allowing vessels increased access to previously closed areas may allow them to increase their annual harvests and therefore, increase profits.

6.6 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 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.

6.7 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.

6.8 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

The proposed rule and the environmental assessment (EA) that considers allowing sector vessels access to certain portions of year-round closure areas present a description of the purpose and need of the proposed action (approval of sector exemptions allowing vessels to access closed areas), the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. Once a proposed 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 proposed rule will have specific information on the areas that sector vessels could be able to access, as well as when, and with what gear. 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. A preliminary review indicates this action as proposed is 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). Framework Adjustment 48 included an analysis on a provision allowing sectors to request the opportunity to fish in a closed area. The potential approval of sector exemptions to closed areas was excluded from the May 1, 2013 sector operations plan proposed and final rule so that more attention could be paid to whether or not vessels

should be provided access to the year-round closure areas. Many additional analyses were included in the Environmental Assessment (EA) accompanying this rule, in addition to those included in FW 48. Because this action was separate from the May 1, 2013 sector operations final rule, we were able to provide more current information. The rule package and EA will be available through regulations.gov and through the Northeast Regional Office website.

The proposed rule 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.

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. Information in the environmental assessment, including landings and revenue information, is based upon information from a variety of credible sources including NMFS. NMFS, in conjunction with the commercial fishery, operates multiple data collection programs (e.g., vessel trip reports, commercial dealer databases, NMFS Observer Program, At-Sea Monitoring). These programs incorporate peer-reviewed, scientifically valid sampling protocols. 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 these documents were prepared using data from accepted sources. The New England Fishery Management Council's Closed Area Technical Team CATT) developed many analyses to identify areas critical to groundfish, such as areas where juvenile habitats and spawning areas. The methodologies used by the CATT were recently approved by the Council's Science and Statistical Committee on May 16, 2013. The CATT analyses are included in the Environmental Assessment accompanying this action and findings from the Closed Area Technical Team have been incorporated into this proposed action.

The policy choices (i.e., the proposed alternatives) are supported by the available scientific information and are clearly articulated in the proposed rule and environmental assessment. The proposed alternatives are designed to meet the goals and objectives of the FMP and the MSA. The supporting materials and analyses used to develop the alternatives are contained in readily available documents that are specified in the environmental assessment for FW 48 and this action.

The process used in review of the proposed rule and EA involves NMFS' Northeast Regional Office, NMFS' Northeast Fisheries Science Center (NEFSC), and headquarters. The NEFSC review was conducted by social scientists and economists. Through the proposed and final rule process, the public and the New England Fishery Management Council will have an opportunity to comment on any aspect of the proposed operations plans and EA. The review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, law enforcement, protected species, and compliance with the applicable laws. Final approval of the action will be by the Regional Administrator, Northeast Region.

6.9 REGULATORY FLEXIBILITY ACT (RFA)

6.9.4 EXECUTIVE ORDER 12866

The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section 5.0 of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action in accordance with the guidelines established by E.O. 12866. The OMB has declared this action significant.

E.O. 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant action is any regulatory action that may:

1* Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

2* Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

3* Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

4* Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

6.9.5 OBJECTIVES

The purpose of this action is to provide increased access in FY 2013 to the year-round mortality closure areas through regulatory exemptions associated with sector's FY 2013 operations plans. 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 additional flexible fisheries management that alleviates potential social and economic hardships resulting from those reductions. This action seeks to maximize the harvest of healthy stocks 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. This includes ensuring that additional opportunity provided by closed area access would not jeopardize stock rebuilding or ongoing habitat omnibus amendment efforts.

6.9.6 DESCRIPTION

A description of the entities affected by this Environmental Assesment, specifically the stakeholders of the New England Groundfish Fishery, is provided in Section 4.6 of this document.

6.9.7 PROBLEM STATEMENT

The need and purpose of the actions proposed in this Environmental Assessment are set forth in Section 3.2 of this document and are incorporated herein by reference.

6.9.8 ANALYSIS OF ALTERNATIVES

This section provides an analysis of each proposed alternative of this action as mandated by EO 12866. The focus will be on the expected changes 1) in net benefits and costs to stakeholders of the New England Groundfish Fishery, 2) changes to the distribution of benefits and costs within the industry, 3) changes in income and employment, 4) cumulative impacts of the regulation, and 5) changes in other social concerns. This RIR will summarize and highlight the major findings of the economic impacts analysis provided in Section 5.1.5 of this document, as mandated by EO 12866.

When assessing net benefits and costs of the regulations, it is important to note that the analysis will focus on producer surplus only, namely the impacted fishing businesses. Consumer surplus is not expected to be affected by any of the regulatory changes proposed herein, given the large supply of domestic and foreign seafood imports.

6.9.8.4 ACCESS TO CLOSED AREA I YEAR ROUND CLOSED AREA

A detailed description of this alternative can be found in Section 3.1 of this document.

If this option would be adopted, this measure would allow sector vessels access to a portion of Closed Area I until February 15, 2014. Trawl vessels would be restricted to selective trawl gear, such as the Ruhle or Haddock Separator trawl or other selective gear that is currently required to fish within a Special Access Program. Hook vessels would be permitted in this area when specified. Gillnet vessels would be prohibited from fishing in Closed Area I.This option would increase net benefits to seafood producers by allowing access to fishing grounds that may have higher catch rates, a more efficient mix of species relative to individual vessel quota holdings, or greater access to non-groundfish species. Analysis of catch rate and aggregate effort data indicates that this option is likely to yield relatively small increases in net benefits, due primarily to improved catch rates for groundfish stocks.

6.9.8.5 ACCESS TO CLOSED AREA II YEAR ROUND CLOSED AREA

A detailed description of this alternative can be found in Section 3.2 of this document.

If this option would be adopted, this measure would allow sector vessels access to the area between 41° 30'N and the Closed Area II Habitat Closure Area of Closed Area II would be open to specific groundfish sector gear types during various portions of fishing year 2013 until December 31, 2013. Trawl vessels would be restricted to selective trawl gear, such as the Ruhle or Haddock Separator trawl or other selective gear that is currently required to fish within a Special Access Program. Hook vessels would be permitted in this area when specified (see below), however gillnet vessels would be prohibited from fishing in Closed Area II.This option would increase net benefits to seafood producers by allowing access to fishing grounds that may have higher catch rates, a more efficient mix of species relative to individual vessel quota holdings, or greater access to non-groundfish species. Analysis of catch rate and aggregate effort data indicates that this option is likely to yield small increases in net benefits to groundfish vessels, due primarily to improved catch rates for both groundfish and non-groundfish stocks. This option may yield small decreases in net benefits to lobster vessels, which will not be permitted to set traps in this area

during November and December. Historical fishing effort data indicates that these months were very lightly fished and the effect is expected to be negligible.

6.9.8.6 ACCESS TO THE WESTERN PORTIONS OF THE NANTUCKET LIGHTSHIP YEAR ROUND CLOSED AREA

A detailed description of this alternative can be found in Section 3.3 of this document.

If this option would be adopted,this measure would allow sector vessels to access Western portions of the Nantucket Lightship Closed area until April 30, 2014. Gillnet vessels would be required to use pingers when fishing in this area.This option is likely to increase net benefits to seafood producers by allowing access to fishing grounds that may have higher catch rates, a more efficient mix of species relative to individual vessel quota holdings, or greater access to non-groundfish species. Analysis of catch rate and aggregate effort data indicates that this option is likely to yield increases in net benefits, due primarily to to improved catch rates on non-groundfish stocks.

6.9.8.7 ACCESS TO THE EASTER PORTIONS OF THE NANTUCKET LIGHTSHIP YEAR ROUND CLOSED AREA

A detailed description of this alternative can be found in Section 3.4 of this document.

If this option would be adopted,this measure would allow sector vessels to access Eastern portions of the Nantucket Lightship Closed area until April 30, 2014. Gillnet vessels would be required to use pingers when fishing in this area.This option is likely to increase net benefits to seafood producers by allowing access to fishing grounds that may have higher catch rates, a more efficient mix of species relative to individual vessel quota holdings, or greater access to non-groundfish species. Analysis of catch rate and aggregate effort data indicates that this option is likely to yield only small increases in net benefits, as catch rates and aggregate fishing effort in neighboring areas are low relative to surrounding fishing grounds.

6.9.9 DETERMINATION OF SIGNIFICANCE

The Proposed Action is not predicted to have an adverse impact on fishing vessels, purchasers of seafood products, ports, recreational anglers, and operators of party/charter businesses in excess of $100 million. No adverse economic impacts will result from this proposed action throughout the range of the groundfish fishery. Aggregate impacts are anticipated to be positive but of uncertain magnitudes. These impacts will most likely affect vessels traditionally fishing in the vicinity of the proposed areas, typically larger offshore vessels from all Northeast ports and smaller and medium sized vessels from Massachusetts and Rhode Island ports.

6.10 INITIAL REGULATORY FLEXIBILITY ACT

6.10.4 REGULATORY FLEXIBILITY ACT

6.10.4.4 INTRODUCTION

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

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

6.10.4.5 DESCRIPTION OF REASONS WHY ACTION BY THE AGENCY IS BEING CONSIDERED

The need and purpose of the actions are set forth in Section 2.0 of this document and are incorporated herein by reference.

6.10.4.6 STATEMENT OF THE OBJECTIVES OF, AND LEGAL BASIS FOR, THE PROPOSED RULE

The purpose of this action is to provide increased access in FY 2013 to the year-round mortality closure areas through regulatory exemptions associated with sector's FY 2013 operations plans. 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 additional flexible fisheries management that alleviates potential social and economic hardships resulting from those reductions. This action seeks to maximize the harvest of healthy stocks 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. This includes ensuring that additional opportunity provided by closed area access would not jeopardize stock rebuilding or ongoing habitat omnibus amendment efforts.

6.10.4.7 DESCRIPTION AND ESTIMATE OF THE NUMBER OF SMALL ENTITIES TO WHICH THE PROPOSED RULE WILL APPLY

The Small Business Administration (SBA) defines a small business as one that is:

- independently owned and operated
- not dominant in its field of operation
- has annual receipts not in excess of -
  - $4.0 million in the case of commercial harvesting entities, or
  - $7.0 million in the case of for-hire fishing entities

- or if it has fewer than -
  - 500 employees in the case of fish processors, or
  - 100 employees in the case of fish dealers.

This framework action impacts mainly commercial harvesting entities engaged in the limited access groundfish as well as vessels permitted to fish for lobsters in Area 3.

On June 20, 2013, the Small Business Administration (SBA) issued a final rule revising the small business size standards for several industries effective July 22, 2013 (78 FR 37398). The rule increased the size standard for Finfish Fishing from $4.0 to $19.0 million, Shellfish Fishing from $4.0 to $5.0 million, and Other Marine Fishing from $4.0 to $7.0 million. Pursuant to the Regulatory Flexibility Act, and prior to SBA's June 20, 2013, final rule, a certification was developed for this action using SBA's former size standards.

Taking this change and public comment into consideration, NMFS has identified no additional significant alternatives that accomplish statutory objectives and minimize any significant economic impacts of the proposed rule on small entities. Because sector exemptions are voluntary and would likely only be utilized when economically beneficial to sector vessels, we do not see any difference between impacts to larger vessels or companies versus smaller. We also do not see any significant economic impacts in general. Further, the new size standards do not affect the decision to prepare a Final Regulatory Flexibility Analysis as opposed to a certification for this action. Because there are so few companies that were listed as large entities prior to the rule change, increasing the size standards would only further reduce the number of larger entities.

Regulated Commercial Harvesting Entities

Limited Access groundfish harvesting permits

The limited access groundfish fisheries are further sub-classified as those enrolled in the Sector allocation progam and those in the Common Pool. Sector vessels are subject to Sector-level stock-specific Annual Catch Entitlements (ACE) that limit catch of allocated groundfish stocks. Accountability measures (AMs) include a prohibition on fishing inside designated areas once 100% of available Sector ACE has been caught, as well as area-based gear and effort restrictions that are triggered when catch of non-allocated groundfish stocks exceed Allowable Catch Limits (ACLs). Common Pool vessels are subject to various Days-at-sea and trip limits designed to keep catches below ACLs set for vessels enrolled in this program. In general, Sector-enrolled businesses rely more heavily on sales of groundfish species than Common Pool-enrolled vessels. At the beginning of the 2012 Fishing Year (May 1, 2012) there were 1,411 individual limited access permits. Each of these was eligible to join a Sector or enroll in the Common Pool. Alternatively they could also allow their permit to expire by failing to renew it. 827 permits were enrolled in the Sector program and 584 were in the Common Pool.

Area 3 lobster harvesting permits
The offshore lobster fishery occupies Area 3 in the lobster area management plan and only vessels thusly permitted may fish in the offshore areas potentially impacted by the Proposed Action. There are 67 vessels permitted to fish for lobsters in Area 3.

Table 62. Number of permits held in potentially impacted fisheries

	Total groundfish permits	Sector permits	Common Pool permits	A3 Lobster permits
2010	1916	747	709	67
2011	1845	804	607	67
2012	1838	827	584	68

Table 63. Gross sales associated with potentially impacted groundfish permits

Gross sales category	Number permits	Median gross sales	Median gross sales of groundfish
$0	623	$0	$0
<$50K	148	$11,564	$1,171
$50-100K	90	$79,394	$8,139
$100-500K	324	$214,691	$61,800
$500K-1mil	91	$685,581	$141,228
$1-4mil	115	$1,631,287	$977,265
$4-10mil	9	$5,163,482	$1,110,470

Table 64. Gross sales associated with potentially impacted lobster permits

Gross sales category	Number permits	Median gross sales	Median gross sales of lobster
$0	0	$0	$0
<$50K	2	$20,657	$17,189
$50-100K	1	$72,131	$32,060
$100-500K	31	$287,857	$145,354
$500K-1mil	18	$651,213	$551,652
$1-4mil	15	$1,307,824	$1,195,545

Ownership entities in regulated commercial harvesting businesses
Individually-permitted vessels may hold permits for several fisheries, harvesting species of fish that are regulated by several different fishery management plans, even beyond those impacted by the proposed action. Furthermore, multiple permitted vessels and/or permits may be owned by entities affiliated by stock ownership, common management, identity of interest, contractual relationships or economic dependency. For the purposes of this analysis, ownership entities are defined by those entities with common ownership personnel as listed on permit application documentation. Only permits with identical ownership personnel are categorized as an ownership entity. For example, if five permits have the same seven personnel listed as co-owners on their application paperwork, those seven personnel form one ownership entity, covering those five permits. If one or several of the seven owners also own additional vessels, with sub-sets of the original seven personnel or with new co-owners, those ownership arrangements are deemed to be separate ownership entities for the purpose of this analysis.

A summary of regulated ownership entities within potentially impacted fisheries
Ownership data are available for the two sub-fisheries potentially impacted by the proposed action from 2010 onward. However, current data do not support a common ownership entity data field across years. For this reason only one year's gross receipts will be reported, with calendar year 2011 serving as the baseline year for this analysis.

For the groundfish fishery in 2011, there were 1,162 distinct ownership entities identified. Of these, 1,150 are categorized as small and 12 are large entities as per SBA guidelines (Table 65). For the offshore lobster fishery, 52 ownership entities are identified and on is categorized as a large entity as per SBA guidelines (Table 66).

Table 65. Description of groundfish entities regulated by the Proposed Action

sales	Size standard	Number of ownership entities	Average number permits owned per entity	Maximum permits owned per entity	Median gross sales per entity	Average gross sales per entity	Average groundfish sales per entity
$0	small	459	1.1	30	$0	$0	$0
<$50K	small	134	1.0	2	$11,752	$15,746	$4,643
$50-100K	small	74	1.1	4	$74,095	$73,972	$16,206
$100-500K	small	318	1.2	4	$202,721	$237,920	$83,721
$500K-1mil	small	71	1.5	4	$749,548	$739,689	$260,102
$1-4mil	small	94	2.1	8	$1,508,400	$1,704,465	$766,061
$4mil+	large	12	8.8	33	$5,501,592	$8,327,730	$3,161,998
Total ownership entities:		*1,162*					

Table 66. Description of offshore lobster entities regulated by the Proposed Action

sales	Size standard	Number of ownership entities	Average number permits owned per entity	Maximum permits owned per entity	Median gross sales per entity	Average gross sales per entity	Average lobster sales per entity
$0	small	0	0.0	0	$0	$0	$0
<$50K	small	2	1.0	1	$20,657	$20,657	$17,189
$50-100K	small	1	1.0	1	$72,131	$72,131	$32,060
$100-500K	small	24	1.0	2	$234,133	$258,456	$153,784
$500K-1mil	small	15	1.2	2	$634,770	$680,348	$425,488
$1-4mil	small	9	1.8	4	$1,322,720	$1,589,286	$1,179,000
$4mil+	large	1	8.0	8	$10,979,765	$10,979,765	$10,935,859
Total ownership entities:		*52*					

6.10.4.8 DESCRIPTION OF THE PROJECTED REPORTING, RECORD-KEEPING AND OTHER COMPLIANCE REQUIREMENTS OF THE PROPOSED RULE, INCLUDING AN ESTIMATE OF THE CLASSES OF SMALL ENTITIES WHICH WILL BE SUBJECT TO THE REQUIREMENT AND THE TYPE OF PROFESSIONAL SKILLS NECESSARY FOR THE PREPARATION OF THE REPORT OR RECORDS

The proposed rules in this action are not expected to create any additional reporting, record-keeping or other compliance requirements.

6.10.4.9 IDENTIFICATION OF ALL RELEVANT FEDERAL RULES, WHICH MAY DUPLICATE, OVERLAP OR CONFLICT WITH THE PROPOSED RULE

No relevant Federal rules have been identified that would duplicate or overlap with the proposed action.

6.10.4.10 SIGNIFICANCE OF ECONOMIC IMPACTS ON SMALL ENTITIES

Substantial number criterion

In colloquial terms, substantial number refers to "more than a few." Given that the majority of entities in the commercial groundfish industries, both at the permit and ownership entity level, earn less than $4 million annually, all of the proposed alternatives will have positive impacts on a substantial number of small entities.

Significant economic impacts

The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability.

- Disproportionality refers to whether or not the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities.

- Profitability refers to whether or not the regulations significantly reduce profits for a substantial number of small entities.

The proposed action does not place small entities at a significant competitive disadvantage relative to large entities. Impacts are likely to result in positive net revenue gains for all vessels able to fish inside the areas proposed for opening. The magnitude of these positive impacts is uncertain, though it is likely to be small.

The proposed action may yield small decreases in net benefits to lobster vessels, which will not be permitted to set traps in this area during November and December. Historical fishing effort data indicates that these months were very lightly fished and the effect is expected to be negligible.

6.10.4.11 DESCRIPTION OF SIGNIFICANT ALTERNATIVES TO THE PROPOSED RULE AND DISCUSSION OF HOW THE ALTERNATIVES ATTEMPT TO MINIMIZE ECONOMIC IMPACTS ON SMALL ENTITIES

The Proposed Action will not have any negative economic impacts on small entities, and not significant alternatives are proposed.

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APPENDIX A

Rotational gear-use agreement between the offshore lobster industry and sector trawl vessels for the central portion of Closed Area II